Town of Telluride Community Climate Action Plan and Greenhouse Gas Emissions Summary

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Executive Summary

This report creates a Climate Action Plan (CAP) for the Town of Telluride community including an inventory of existing greenhouse gas emissions. It is in direct response to the town government's *2013 Energy Use & Carbon Footprint Summary* that stated the town government's greenhouse gas reduction efforts are aggressive and successfully trending downward; however, the town government comprises only 4% of the total emissions for the community. A community CAP is necessary to address the larger emissions profile and associated strategies, but the town government lacks the necessary resources to generate the community CAP (Guglielmone, 2014). The town government passed a resolution in 2009 committing to reduce greenhouse gas emissions 20% by 2020 over 2005 levels (Town of Telluride, 2009, p. 1). This report finds that the town government greenhouse gas reduction efforts, combined with community efforts have met and in fact, exceeded the reduction goal. Realizing the goal had already been met, two questions arose: Is meeting the reduction goal enough? And, given that the goal has been met, does it mean that the community is prepared for climate change? Scholarly sources note the importance of a town government's role effectuating CAPs because they work directly with local citizens and administer local land use, transportation systems, and municipal utilities. Additionally, scholarly sources note that CAPs are evolving into mitigation and climate adaptation plans aimed at responding to the environmental impacts of climate change already in evidence. The practical realities of a community's response to climate change are not addressed simply by meeting greenhouse gas reduction goals. The conclusions and strategies found in this report, therefore, focus on measures that better address a community's ability to adapt to climate change, such as reducing the community's reliance on non-renewable energy, developing local food sources, and increasing local transportation and energy security.

Creation of a Community Climate Action Plan

The Town of Telluride (community) is a small resort-oriented mountain town, located on the western slope of Colorado, unique in having both restrictive growth regulations and generous funding streams, which serve to insulate the community from economic fluctuations and undue development pressures. Telluride, however, is not insulated from the unknown impacts of climate change which include persistent rise or fall in temperatures, rain events, drought events, and an increase in existing geologic hazards, such as rock fall, avalanche, flooding and unstable slopes. With appropriate adaptive measures, the community can lessen its reliance upon a snow-based and recreation-oriented economy affected by unanticipated climate related events.

Locally, there is a need for a community Climate Action Plan (CAP) which will address the larger emissions profile and broaden the communities' ability to mitigate and adapt to climate change. To date, there is no community greenhouse gas (GHG) inventory or any developed strategies aimed at meeting community mitigation and adaptation goals. This need was noted in the *2013 Town of Telluride Energy Audit* (Guglielmone, 2014) and subsequent update to the Telluride Town Council. Ms. Guglielmone recommends that the community, "Adopt a Climate Action Plan for the Town of Telluride that encompasses projects and goals for the entire community, not just the Town Government" (Guglielmone, 2014, p. 12).

This report will produce a Climate Action Plan for the Town of Telluride community and address the following objectives:

- Present GHG emission data from 2010 through 2013 and illustrate the GHG emission trend.
- Illustrate the existing town government and community reduction measures classified by energy conservation and reduction, energy offsets or direct energy generation.
- Determine a set of mitigation and adaptation community strategies.

EcoAction Partners is a regional non-profit organization funded by the Town of Telluride and other local governments and organizations, to facilitate GHG inventory needs of the region and reduction efforts. EcoAction Partners has been maintaining the greenhouse gas inventory for the region since 2009 (Rommel, 2014). Ouray and San Miguel Counties established baseline GHG emissions reporting in 2010 and published the data along with a set of sustainability action recommendations. The town government began baseline GHG reporting in 2005 and continues to refine its reduction strategies. Both the town and the counties' Climate Action Plans and GHG inventories are referenced in this report with regards to data, methodology strategies and recommendations. I encourage that each of the regional reports be reviewed concurrently with this CAP since regional strategies and a collective approach is consistent with the resolution passed by the Telluride Town Council (Town of Telluride, 2009, p. 1). This CAP is neither a perfunctory, "feel good" document nor is it a scare tactic warning of impending climate crisis, but rather, a document intended to address existing stated community goals and to raise awareness regarding adaptive strategies.

The Environmental Protection Agency (EPA) recognizes three levels of Greenhouse Gas inventories and the focus of this report is the "community-level" inventory[1] the primary purpose of which is the following:

> **"Community-level inventories** include emissions from community activities within the local government's jurisdiction, including emissions from sources and/or activities in that community, such as energy, transportation, agricultural,industrial, and waste. A community-wide inventory is a useful planning tool in developing mitigation actions for the entire community." (Environmental Protection Agency, n.d., para. 4)

[1]Governmental Operations Inventory, Community-Level inventory and Regional inventory

The effectiveness of CAPs remains debatable. For example, Boulder's initiatives to reduce carbon emissions by 80% below 1990 levels by 2050 provoked national attention, yet GHG emissions are "headed up, not down" (Payton., 2014, para 2). Boulder is an example of a progressive community with forward thinking strategies, plans and funding, trying to achieve GHG emission reductions unsuccessfully because the measure in place are not adequately addressing the upward GHG trends.

Traditionally communities create a greenhouse gas emissions inventory, and then develop a set of strategies to address GHG reduction measures through adaption of a CAP. We may collectively recall Al Gore's documentary *An Inconvenient Truth* (Guggenheim, 2006) about global warming, which brought these issues to the population at large. Until the past few years, climate change had few noticeable effects in Colorado. This is no longer true. Since 2006, we have experienced severe weather events which included the 2013 Front Range floods impacting an area from Colorado Springs to Fort Collins, and well as two of the top three most destructive wildfires in the state's history (Colorado State Forest Service, 2014). Although some may argue these events are unrelated to climate change, the importance of a community's ability to adapt and mitigate to the effects of unpredictable weather and climate events is evident. Regardless of the correlation to global causes, climate realities require more than data analysis. A CAP can combine mitigating measures to reduce reliance on non-renewable energy sources and adaptive measures to more easily anticipate or plan for unknown climate or environmental events.

Review of Scholarly Literature

Since negotiation of the Kyoto Protocol treaty in 1997, GHG reduction efforts on an international, national, state, and local level have become mainstream concepts with associated implementation strategies because of two main factors. The first factor is the rapid increase of

GHG in the atmosphere due to the industrialization of our planet, and the second factor is the belief that we have already reached "peak oil" which is a belief that the production of oil no longer continues to upswing but to decline (Clark, 2008). Scholarly literature supports the importance of local government's leadership in reducing GHG emissions, and although this report is a community CAP, the town government's ability to shape, both by regulation and policy, community GHG emission reductions has been essential. Scholarly sources also support how community CAP's are rapidly evolving into not just mitigation plans but adaptation plans because responses to a changing physical environment are more in evidence and require more immediate community strategy and response. I have categorized the scholarly review section into two parts: the role of local government, and the evolution of CAPs from data analysis and broad strategies to climate adaptation and action plans.

The Emerging Role of Local Government

Town government can exert much direct influence on its citizens and their behaviors through legislation and policy making. **"**In the United States, local governments have primary control over land use, local transportation systems, and building construction. Each of these areas is a critical component of a CAP" (Boswell, Greve, & Seale, 2012, p. 22). Compared to state or federal branches of government, local government has the most direct relationship with its community and is better able to "show more initiative, and achieve greater success than most nations, because they can easily recognize grassroots trends, respond in an innovative manner at a faster temp than other more wieldy administrations. This also holds true for climate protection" (van Staden & Musco, 2010, p.83). Despite the ability for local governments to lead the way, there are still tremendous resource obstacles and those individuals that may believe CAPs to be either unimaginable or ineffective.

Many governments first model a GHG emissions reduction plan with their own facilities and operations. The Telluride town government chose to first implement GHG reduction efforts in this manner. During a Town Council work session, Karen Guglielmone, the author of the town government CAP for Telluride municipal services and operations, noted that a community CAP is necessary, but that the town government lacked the necessary resources to generate the community plan (Guglielmone, 2014, p.1). Managing the town government CAP and the community CAP and associated strategies poses a resource challenge for the town.

In addition to providing municipal services and sound land use planning, governments on all levels have more recently added additional responsibilities previously un-envisioned related to climate based initiatives requiring more human resource with less fiscal resource. van Staden & Musco (2010) note that one of the deficiencies of local CAP planning is that usually the planning occurs by one or a few political or administrative individuals, or there are brief externally funded projects, which are short term and that comprehensive and regularly updated CAP are not maintained and conducted. A meaningful CAP for a community requires yearly review and update because emission data and variables such as weather, rate of development, increase or decrease in population, yearly initiatives, or cost of utilities or services can fluctuate year to year. The GHG emissions profile for any community is complex and often difficult to interpret simply through a report of numbers and figures. A local government and community's challenge remains in assuring an enduring fiscal and or political commitment through grant funding and initiatives, within its own organizational framework, or ongoing regional commitments. Global warming and its associated impacts are widely debated and subject to political reprioritization as evidenced at the federal level. But it does not diminish its importance or relevance.

Mitigation and Adaptation

Emerging with CAPs as communities implement them is the evolution of adaptation measures. We are seeing the effect of climate change in our communities including earthquake, flood, avalanche, and a variety of extreme weather related events tying realities of climate change to emergency preparedness, emergency response, and local resiliency. "Although mitigation is the only real long-term solution to all of the impacts of climate change (with the possible exception of geo-engineering), adaptation is now a necessity"(Picketts, Dery, & Curry, 2014, p.1). For example, what would the community do if we had year round rain and not snow? What if the community endured sub-zero temperatures and an electrical outage for an extended period of time? What if a mud slide or flood event cut off transportation routes to our community, like that which occurred to Estes Park during the flood event in 2013? This level of community action occurs not just through town government preparedness, but multi-jurisdictional cooperation and voluntary community efforts.

> Adaptation is a more complex issue, and requires on the one hand the recognition that non-adapting is not an option, but also that this requires a coherent cross-sectoral, cross-disciplinary, cross-community approach – far beyond just taking a political decision to respond. Responses are needed that address climate change, not only as an environmental challenge, but as a socio-economic, political, environmental and security challenge (Van Staden & Musco, 2010, p. 3).

We must integrate adaptive measures and not just mitigation measures, into CAPs. In review of town government documents, the town government participates in and has adopted the *San Miguel County All Hazard Mitigation Plan* (2011) and the Federal Emergency Management

Plan's (FEMA) National Flood Insurance Program so that the community will receive federal disaster assistance and be eligible for grant funding. By securing municipal water rights, adopting a water conservation plan and replacing outdated water/waste water components and systems, the town already provides associated efforts supportive of an adaptation plan. "Adaptation and mitigation should be viewed as compliments, not competitors, as both are necessary responses to reduce the negative impacts of climate change" (Picketts, Dery, & Curry, 2014, p. 985).

van Staden & Musco emphasize that energy reduction and conservation measures are an important intermediary step between reliance on fossil fuels and total renewable energy. "If we keep wasting energy, the additional renewable energy supply will just be fed into wasteful energy use and the economics of renewable energy supply really depends on efficient use" (2010, p.54).

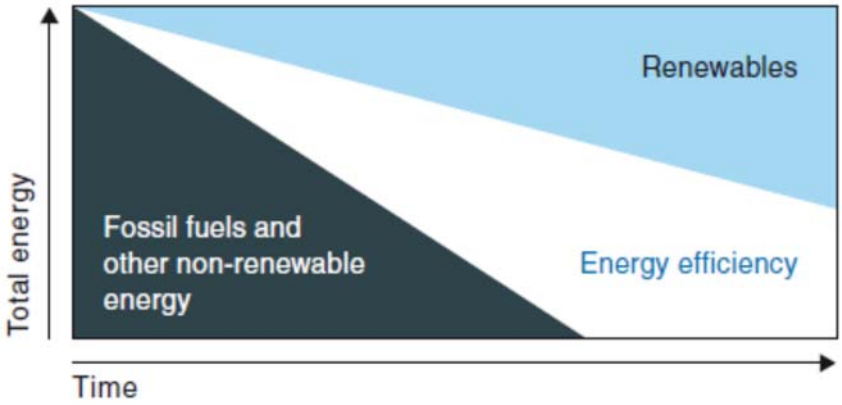


Figure 1. Energy efficiency provides us with the time needed to replace fossil fuels and other non-sustainable energy sources with renewables in an ecological, economic and socially responsible manner

Note. Reprinted from *Local Governments and Climate Change: Sustainable Energy Planning and Implementation in Small and Medium Sized Communities* (p. 57), by M. van Staden & F. Musco, 2010, New York City, NY: Springer. Copyright 2010 by Springer Science+Business Media. Reprinted with permission.

van Staden & Musco theorize that energy efficiency is a necessary step between total reliance on fossil fuels and total reliance on sustainable renewables. "In other words, we have to go through the tipping point – the time when ideas, such as the need to pursue energy-saving

measures more aggressively, become the accepted norm" (2010, p. 57). Some of the recommendations in this report support this concept of a CAP serving as a transition plan between reliance on non-renewable energies to renewable energies. By introducing conservation and reduction measures, renewable energy sources need not immediately replace the existing systems, but rather conservation will be an acceptable norm by the time renewables are the primary energy source.

The scholarly review points to three key findings. The first is that the town government can have significant positive impacts relative to reducing a local community's GHG emissions because of its control of local land use and utilities, its direct relationship with its community, and its management of infrastructure and regulations. Local government can be influential to a community's GHG reduction efforts, yet fiscal or resource constraints can also limits a local government's ability to meet a community's broader needs. The second is that a CAP is more useful with adaptation strategies because a community must consider future environmental and climactic changes and events. Third, reducing GHG emissions also means finding renewable energy sources and systems to, over time, replace non-renewable energy systems.

Purpose and Methodology

The project will produce a Climate Action Plan for the Town of Telluride community and address the following CAP objectives:

- Present GHG emission data from 2010 thru 2013 and illustrate the GHG emission trend.
- Illustrate the existing town government and community reduction measures classified by energy conservation and reduction, energy offsets or direct energy generation.
- Determine a set of community mitigation and adaptation strategies.

This methodology employed in this study is primarily quantitative. The inventory data relies upon a series of worksheets produced by the University of Colorado Denver (UCD) Center for Sustainable Infrastructure Systems, titled the "*2010 Ouray and San Miguel County Greenhouse Gas Emissions Inventory"* (UCD Worksheets). EcoAction Partners and the Sneffels Energy Board received a grant from the Walmart Foundation in 2010 to fund the creation of a GHG inventory workbook and strategy which was produced by UCD and is now maintained by the EcoAction Partners. It established a methodology, framework and resulting benchmark for regional GHG emissions. The town government determined 2005 to be the GHG emissions benchmark year. The region, inclusive of the Town of Telluride community, determined 2010 to be the GHG emissions benchmark year because the UCD Worksheets created a consistent methodology, a more accurate reporting mechanism and the availability of more comprehensive data. For this report, EcoAction Partners modified the UCD Worksheets with Telluride community specific data to derive the community GHG inventory from 2010 thru 2013.

The inventory includes data related to utility energy, transportation, waste, and food. The town government provided GHG reduction data in this report which decrease the GHG emissions and are categorized as 1) energy conservation and reduction 2) energy offsets or 3) direct energy generation measures. I conducted personal interviews with both Kim Wheels, Community Energy Coordinator with EcoAction Partners and Karen Guglielmone, Public Works Project Manager, Environmental Division with the Town of Telluride. Ms. Wheels provided the data and interpretation of GHG inventory contained within the UCD Worksheets, and Ms. Guglielmone provided GHG reduction measures and associated energy and carbon data compiled by the town government since 2003. In addition, I collected building data from the town government during the period subject to the town government's Green Building Code

(GBC), verified offset community energy purchases such as solar panels from the Clean Energy Collective, and Green Blocks from the San Miguel Power Association (SMPA), and reviewed local published information, scholarly sources, pertinent books, website information and similar Climate Action Plans at the regional, state and national levels. All actions were aimed at developing a comprehensive picture of carbon emissions and carbon reduction efforts found within this report.

The UCD Worksheets follow the International Council for Local Environmental Initiatives (ICLEI) "Five Basic Emission Generating Activities" which are as follows:

- Use of electricity by the community
- Use of fuel in residential and commercial stationary combustion equipment
- On-road passenger and freight motor vehicle travel
- Use of energy in potable water and wastewater treatment and distribution
- Generation of solid waste by the community

(ICLEI, 2013)

The worksheet also follows standard EPA guidelines for producing a community CAP. There are locally justified deviations from the five basic emission generating activities due to the premise that ICLEI supports town government inclusion of other sources and activities in accounting and reporting (ICLEI, 2014). There is a clear distinction to be made in that although EcoAction Partners collects the greenhouse gas emission data year to year, generation of a CAP can embody and include more specific local factors to either increase or decrease these figures depending upon resources determined to be essential to urban life within the community. For example, the community CAP includes methodology to account for the embodied energy in the trans-boundary delivery of food, cement, and fuel, which are not produced locally, but are

necessary, and increase the GHG carbon dioxide equivalents (CO_2e) of the community. The Telluride Regional Airport is included in the transportation emissions data because our community relies upon it, but it is otherwise outside of the town boundary. However, the Gondola that runs between the Town of Telluride and the Town of Mountain Village is paid for and maintained by the Town of Mountain Village and is entirely offset with Renewable Energy Credits (RECs) purchased through SMPA and not therefore listed as a GHG contributor within the community's transportation or energy calculations. These local variables could either be seen as a limitation or strength to a local CAP, but in the least recognize the reliance upon outside sources for some vital community functions and their associated carbon emissions as applicable.

The community method employs a bottom up approach, collecting data, such as utility usage, from end users. Such data collection methods are considered standard for local governments with a smaller geographic area and operational scope (Environmental Protection Agency, 2014). ICLEI continues to evolve its standards. For example, ICLEI models a five-milestone methodology in Europe that recognizes both mitigation milestones and adaptation milestones (ICLEI-Europe, 2014) which this paper will address (See Appendix G).

There are limitations in relying primarily upon quantitative data collection in that it can be biased, misleading, inaccurate or oversimplify the analysis or problem (Nielsen, 2004). EcoAction Partners provided two sets of GHG inventory numbers: one based upon census data, and another including visitors. The visitor figure showed lower GHG emissions per person due simply to economies of scale. The lack of analysis or discussion regarding visitors could be seen as a limitation that could be addressed should subsequent reports be produced in the

community. See Appendix H for GHG emissions table, similar to Table 1, inclusive of visitor data.

Results

With community relevant modifications to the UCD Worksheets, EcoAction Partners generated the following GHG data for the Telluride community for the years 2010-2013. As shown in Table 1, the GHG emissions data shows a decrease of 2.4 metric tons CO_2e per person since the benchmark year of 2010. For the purposes of simplicity and to better address local community needs, as stated above, visitor GHG emission data is not included in this table.

Table 1. Greenhouse Gas Inventory Per Person and Population based upon UCD Worksheets

Description of Benchmark	Telluride, CO (2010)	Telluride, CO (2011)	Telluride, CO (2012)	Telluride, CO (2013)	Units of Measurement
Avg. Res. electricity use	830	849	807	823	kWh/hh/mo
Avg. Res. Natural gas use	80	83	63	81	therms/hh/mo
Avg. Comm/ Ind./ Pub. Buildings Energy use intensity	389	325	218	318	Kbtu/ft²/year
Vehicle Miles per person per day	26.0	26.0	26.0	25.6	VMT/person/day
Water supply	180	203	193	193	gallons/person/day
Municipal Solid Waste	4.3	7.0	6.9	6.9	lb/person/day
GHG Emissions per person	**35.5**	**35.4**	**32.9**	**33.1**	**Mt-CO_2e/person/year***
GHG Emissions per population	**82,537**	**83,827**	**78,828**	**79,264**	**Mt-CO2e/population/year****
Census population data per year	2325	2368	2396	2396	

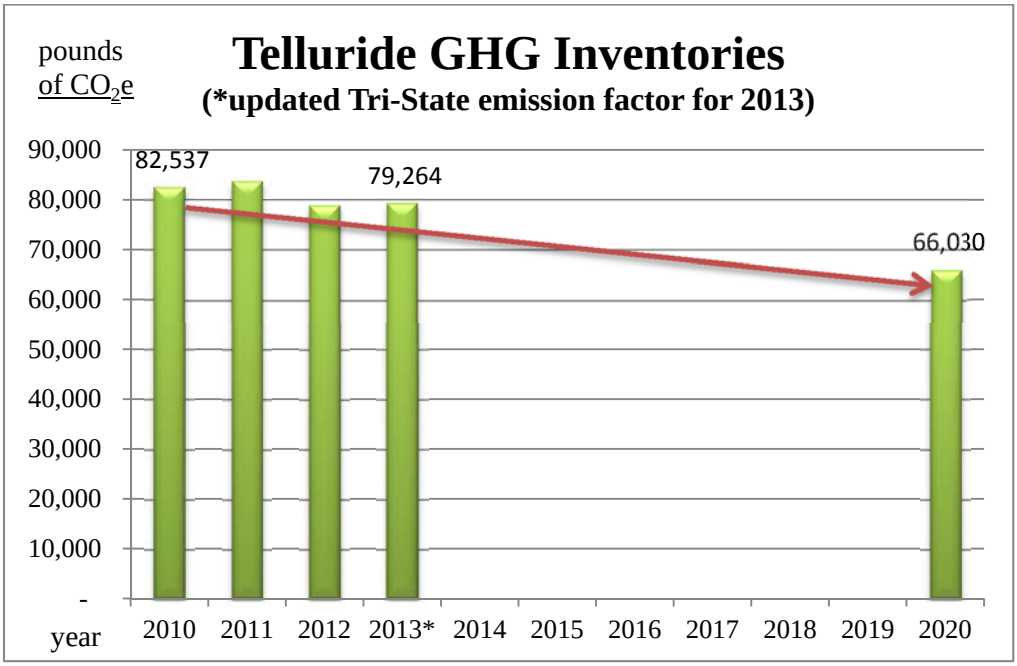
Note. Data provided by EcoAction Partners. *Mt-CO^{2e}/person/year means metric tons of carbon dioxide equivalents a person a year. **Mt-CO^{2e}/population/year means metric tons of carbon dioxide equivalents per population a year. The GHG emissions per person times (x) per census population derives emission per population per year

Greenhouse Gas Emission pie charts for the community depicting emission categories can be found in Appendix C and D for 2010 and 2013, respectively. The pie charts illustrate the GHG emissions profile illustrating that utility energy usage is the highest carbon emitter at over 57.1%, outpacing transportation at 18%, food at 13% percent and waste at 11.2% percent.

Utility energy usage includes residential, commercial and government facilities and energy usage associated with municipal water treatment.

When we look at the overall community GHG emission data trend, Table 2 illustrates what a 20% reduction of GHG emissions would look like by 2020 and what emissions are between 2010 and 2013.

Table 2. Telluride GHG Inventory Trend 2010 to 2020, 20% Reduction Goal



Note. Table produced by EcoAction Partners for this report. *Reflects the CO_2e adjustment made by Tri-State from 1kWh equals 2.2 pounds of CO_2e to 1 kWh equals 1.93 pounds of CO_2e based upon an increase in Tri-States renewable portfolio as of January, 2013.

A 20% reduction in GHG emissions from 2010 to 2020 would be from 35.5 Mt- CO_2e /person/year (metric tons of carbon dioxide equivalent per person per year) in 2010 to 28.4 Mt-CO_2e /person/year, or a reduction of 1 Mt-CO_2e a year per person between 2014 and 2020 (See Table 1). Community wide, the reduction would be 2,358 Mt-CO_2e each year between 2014 and 2020. As illustrated in Table 2, the community is incrementally reducing its overall emissions despite known variables such as an increase in population, influx of tourists, new

construction and weather. Density generally decreases GHG emission per capita due to economies of scale. Also, according to a personal interview with Kim Wheels, there is a direct relationship between GHG emissions and weather, which outweighs population fluctuations or the economy (K. Wheels, personal communication, October 12, 2014). The town government's efforts are the main contributor to the community GHG reduction trend. The town government's reduction efforts began in 2003 with energy audits on town government facilities and implementation of the recommendations within a 12 month period (Guglielmone, 2014). Guglielmone further noted in the *2013 Energy Use & Carbon Footprint Summary for the Town of Telluride Government Facilities & Operations Annual Energy Audit* (2013 Annual Energy Use & Carbon Footprint Summary) that programs and strategies become more sophisticated over time, stating, "Investing in renewable energy sources as a compliment to energy efficiency measures continues to be a winning strategy for Telluride Government in 2013." (Guglielmone, 2014, p. 1). Appendix E lists the town government initiated large scale GHG mitigation projects to date. A comprehensive understanding can be found within the 2013 Annual Energy Use & Carbon Footprint Summary (Guglielmone, 2014).

Additionally, since adoption of the town's GCB in 2010, the town government has issued building permits for new construction totaling 139,342 square feet (10,772 square feet of commercial and 128,570 square feet of residential) all subject to the energy and building efficiency measures. The GBC and Telluride Energy Mitigation Plan (TEMP) have implemented mandatory carbon neutral standards to address what otherwise would have been increased energy consumption from new construction.

Appendix A illustrates the town government and community carbon tracking/mitigation measures thru 2013. The two largest carbon reduction measures are the town government's

purchase of the Bridal Veil micro-hydro renewable energy credits (RECs) and the community purchases of San Miguel Power Green Blocks (RECs). All other reduction measures are listed within the table. The town is also unique in that it is comprised of 1,418 acres of which 1,026 acres are zoned Open Space Conservation Easement, Open Space or Park with significant vegetation and trees and the existing zoning or conservation easement mechanisms preclude them from development. Carbon sequestration (when vegetation removes carbon from the atmosphere and replaces it with oxygen) is a known GHG reducer and is therefore, a valuable and ongoing community asset. Overall, the community has reduced GHG emission between 2010 and 2013 by 4% which equates to nearly four million pounds of CO_2e.

Appendix B illustrates a table of additional mitigation measures both by the town government and community that further reduce GHG emissions in 2014 and 2015. The most significant energy offset measure is the town government purchase of Ridgway Dam micro-hydo RECs in 2014, which offsets 28,600,000 pounds of CO_2e. Next is the power purchase agreement between the town government and SMPA which agrees to sell the onsite micro-hydro power (micro-hydro) generated at the town owned Pandora water treatment plant at an estimated carbon reduction of 3,366,000 pounds of CO_2e a year. Both of these projects required significant financial investment and provide energy offsets to existing usage. By the end of 2015, it is estimated that GHG emissions for the community will show a 22% reduction over 2010 levels, exceeding the emission goal and assuming REC purchases remain the same through 2020. It is also worth noting that the town government purchased 464 solar panels from the SMPA Solar Farm, it offset energy usage on Affordable Housing Units and Employee Dwelling Units in the community. Additionally the community has purchased an addition 895 solar panels from the SMPA Solar Farm to date. The community solar panel purchases constitute both voluntary and

required purchases subject to the GBC. These purchases further reduce the carbon emissions of the community by 1,025,542 pounds of CO_2e each year. The following table summarizes the GHG inventory and reduction efforts through 2015.

Table 3. Summary of the Community GHG Inventory and Reduction Efforts Through 2015

Community Greenhouse Gas Emissions Summary	Mt/CO_2e*
2010 Greenhouse Gas Inventory Benchmark	82,537
2013 Greenhouse Gas Inventory	79,264
2020 Greenhouse Gas Emission Goal	66,030
Reduction from 2010 through 2013 (percent)	4%
Additional 2014/2015 GHG Reduction Measures	-14,926
Estimated 2014 Emissions	64,338
Estimated Reduction 2010 through 2015 (percent)	22%

*Metric tons of carbon dioxide equivalent

Recommendations

The town government's efforts have had much influence reducing the community GHG emissions primarily by energy offset purchases and direct energy generation as shown in Appendices A & B. These reduction measures rely on significant monetary and resource commitments that many local communities may not have available to them without state or federal grant assistance. The community CAP is necessary to further address local adaptive measures regarding changing environmental realities and reducing reliance upon non-renewable energy sources.

The following list of strategies was generated primarily through online analysis of existing pilot programs and successfully adopted programs within the United States. Additional successful strategies were integrated from researching other CAPs. I have knowledge and experience with the town government's Municipal Code which includes the Land Use Code (LUC) and GCB; therefore, the remainder of the strategies are drawn from understanding how

municipal legislation and administration can better address energy conservation and reductions measures through regulatory and policy changes.

The following list of recommendations are based upon the four GHG emission areas of Energy, Transportation, Waste and Food with the additional following notations regarding which mitigation area is relevant: Energy Conservation and Reduction (ECR), Offset Measure (OM), Direct Energy Generation (DEG)

Residential and commercial utility usage alone constitutes 51% of the GHG emissions for the community. Energy conservation and reduction measures in this area constitute the highest priority. Table 4 below lists each primary heading, subheadings and recommendations.

Table 4 Mitigation and Adaptation Strategies by Category

Energy

Land Use Code
Add *Energy Efficiency & Conservation* as a Planned Unit Development (PUD) public benefit. For example this would encourage net-zero development, geothermal heating and cooling systems, onsite solar, or off-site energy mitigation above the existing GBC requirements, in exchange for dimensional variations allowed pursuant to a PUD. (ECR)
Allow the town government discretion to require large scale developments to provide additional information like GHG emissions analysis based upon modeled energy use and require incorporation of energy and water conservation measures into the development project plans to be reviewed and approved by the Planning and Zoning Commission prior to final development approval. (ECR)
Green Building Code
Expand the existing requirement that 100% of a home's electrical use must be provided for with renewable energy, either produced on-site or purchased through a Green Power production program (Town of Telluride, 2010), to include energy offset requirements for conditioned space within accessory, secondary, commercial structures and large scale additions. (OM)

Scale the existing GBC regulation so that 100% of a home's energy usage be offset with renewable energy to be more reflective of offsetting the actual use of the energy based upon different building types such as commercial use, accessory use or additions to existing development, based upon an average energy use per square footage analysis for building type. (OM)
Decrease the HERS[1] Index per home size category by 10, and require the square footage threshold to include calculation of conditioned basement space for additions and new construction. Decrease HERS index requirement from 80 to "70 or less" for residential buildings up to 2500 square feet. Decrease HERS index requirement from 70 to "60 or less" for residential building 2500 square feet or greater. (ECR)
Verify existing energy requirements and keep the requirement that is more restrictive between the GBC and any future energy code amendment.
Continue to enforce the existing GCB and Telluride Energy Mitigation Program ("TEMP") requirements specific to: low flow fixtures, hot water and boiler efficiency standards for new and replacement systems, U (window) and R (insulation) values, HERS requirements, lighting, timers and sensors, and renewable energy requirements. Policy implementation: owner contractor checklist provided at issuance of a building permit stating GBC requirements and acknowledgement. (ECR)
Verify interior lighting wattage and system energy usage so that interior lighting energy usage not exceed a threshold per square footage of construction. (ECR)
Discourage and minimize exterior heating of construction sites during the cold months. (ECR)
Requirements for Existing (older) Structures
Require an energy audit (from a licensed provider) and require installation of energy and water conservation devices and materials prior to transfer of title or sale on single family homes, multi-family homes, condominiums, hotel-condominiums and hotels. A Certificate of Compliance must be provided to the buyer prior to title transfer (City and County of San Francisco, 2009). Certain exemptions could apply for homes built after the Green Building Code adoption. (ECR)

Other Considerations

Regional continued supporting of SMPA's program to reimburse for residential energy audits and other programs aimed at reducing existing energy consumption as well as encouraging renewable energy alternatives. (ECR)
Consider an additional in town site for an additional 100 kW solar array. (DEG)
Encourage onsite photo-voltaic systems to reduce onsite energy usage. (DEG)

[1]HERS is the Home Energy Rating System (HERS) Index and is the industry standard by which a home's energy efficiency is measured. It's also the nationally recognized system for inspecting and calculating a home's energy performance (RESNET, 2014)

Transportation

Consider a community electric charging station or other alternative energy support of vehicles, and transportation less reliant on fossil fuels. (ECR)
Continue to support the community transportation system, the Galloping Goose, and encourage small van pool commuter systems. (ECR)
Continue reinforcing pedestrian and bike friendly circulation and planning efforts. (ECR)
Prioritize building affordable housing units within the Town of Telluride in order to reduce fossil fuel consumption associated with commuter miles. (ECR)
Encourage employers with more than 15 employees to provide local affordable housing opportunities for their employees. (ECR)
Encourage affordable housing mitigation units be constructed onsite, off-site or concurrent with large scale commercial and mixed use development. (ECR)

Food

Consider a "Cap and Spade" Program (Greenaway, 2012). It is similar to a carbon tax in that excess energy usage (to be determined what "excess" means) would require a tax with the funding allocated to support the production and distribution of local food. For example the funds could be used to guarantee a percentage of local food production and distribution through an existing and established regional CSA, farm or community garden. The funds could also facilitate building soil, plant cover crops, manage grazing practices to sequester carbon, or deed restrict property to farming and agricultural use. The funds that support the Production of additional produce, goods or services would be recirculated in the local community like at the farmer's market, pocket park market sales or purchased by the local grocery stores for resale. These efforts reduce the transportation costs for goods and services by supporting systems to grow and raise local regional food, provide more nutrition in food and support the local workforce and economy. OM
Better quantify existing regional food production within a defined region, including farmer's market and pocket park sales within the Town of Telluride also include CSA purchases to help determine a goal to increase local food production and food security. (ECR)

Refuse and Recycling (aka waste)

Prioritize a composting program which could divert up to 50% of waste otherwise transported to the local landfill. The City of Boulder pilot program diverted 55% to 69% of residential refuse (Yepsen, 2009). It could require mandatory residential curbside organic collection and be limited to fruits, vegetables, food-soiled paper and compostable products to reduce bear attractant materials (like meat or poultry). It could include alternate pick up every other week with recyclables. Diverting refuse by reuse reduces transportation miles to landfills and promotes better waste efficiencies by reusing valuable compostable materials. (ECR)

Require Municipal refuse and recycling contracts to provide more accurate reporting on recyclables and refuse, integrate compost bins and fees into the pricing and service structure. Consider beginning a pilot program with the efforts focused on diversion and collection rather than onsite individual composting efforts. (ECR)
Commercial refuse and recycling in the Town of Telluride still requires more attention. (ECR)
Encourage a transfer facility to accommodate construction refuse, sorting and reuse as feasible. (ECR)

Conclusion

Based upon the current data, the Town of Telluride community will exceed the 20% reduction goal by 2020 by adhering to its current reduction commitments. The majority of successful carbon reduction efforts are due to the town government's strategies that have grown more sophisticated over time and now include large scale projects that are achieving significant energy offsets and carbon reductions. The town government's green building program has successfully reduced energy consumption on the front end and entirely mitigated some energy uses which would otherwise show energy data increases to a much greater extent. This community CAP focuses on conservation and reduction efforts aimed at securing local energy, transportation, and food security. The town government can continue to participate in a leading role by modifying existing municipal code regulations, better enforcing its existing regulations, and adopting improved GBC regulations. Larger community objectives also focus on a continued commitment to building affordable housing and providing local/regional transportation. This report recommends that the town government and community maintain many of the existing GHG reduction strategies in place, including offset measures like REC purchases and onsite energy generation created by additional in-town solar arrays and micro-hydro opportunities. Similarly community efforts such as the ongoing preservation of the existing 1026 acres of undeveloped land for the purposes of carbon sequestration, SMPA solar farm purchases and Green Block purchases all contribute to GHG reduction efforts.

There are three primary strategies that this report recommends the community prioritize to better address adaptation. The first is to modify town regulations to better encourage energy conservation and reduction efforts associated with development. Requiring that older homes have an energy audit and installation of energy and water conservation devices and materials upon sale or transfer could be more effective as a regulation because modifying individual behavior and modification of home owners is less predictable and reliable. A curbside composting program can reduce the transportation of refuse and materials out of the community. Finally, creating a program, aimed at curbing excessive energy usage, which would require that a fee be paid by the community's users that consume above an established baseline level. These monies can be dedicated to supporting local agriculture and farming efforts. The mechanism could work like the TEMP fee program but for excess interior energy usage or it could be administered upon sale or transfer of a home and associated with a required energy audit. Supporting local agriculture and farming create and maintain jobs, encourages cultivation of more land for agricultural purposes, reduce transportation costs associated with food distribution, and secures that a percentage of food consumed within the community is grown locally. This strategy reduces reliance upon transportation of food from long distances. Local based food production and distribution also better assures that food can continue to be produced and distributed should the existing global food distribution systems fail or diminish for reasons such as a climate related events.

Unique to a small and rural town is the community's ongoing participation in the National Flood Insurance Program and the County's All-Hazard Mitigation Plan, both of which assure future federal funding and assistance should natural hazards occur. Participation in these programs requires the town government to provide ongoing monitoring of stormwater drainage,

floodplain and wetland monitoring. Additionally, town regulations mandate all development to mitigate or avoid geohazards, floodplains, wetlands, and groundwater which minimize risks posed by climate change to the Telluride community.

From a policy perspective, the town government has discussed reducing reliance on a snow-based economy by diversifying and expanding the summer festival season. This policy appears to have come to fruition, as the past few summer's sales tax revenues have outpaced the ski season revenues. Additionally the town has secured water rights and diversified its collection and treatment plants to meet the future municipal water demands of the community.

A community CAP requires that the electorate take responsibility for GHG emission levels, mitigation, and adaptation strategies. As shown in Appendix C (pie chart) 96% of GHG emissions are attributable to the community versus 4% for the town government, although the town government's aggressive strategies are effectively decreasing the entire community's GHG emissions. A majority of community level CAPs are produced either by the local government or a grassroots group of citizens. This CAP is neither, and will require that a majority of the electorate support it in order for it to be successful.

Meeting and exceeding GHG reduction goals is not the full measure of success and oversimplifies the complexity of the issue. Although preparedness cannot eliminate unforeseen climate related environmental events, by combining the existing GHG emissions reduction efforts with adaptation measures, should an energy crisis or unexpected climate event occur, the community will be better able to adapt, modify and recover more quickly.

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Appendix A

Community Carbon Tracking and Mitigation Measures through 2013

	Community Carbon Tracking and Mitigation Measures through 2013	Cost	Estimated Annual Electrical Generation (kWh)	CO2e Lbs Decrease
Energy Efficiency & Conservation				
	See 2013 Energy Audit for Town Government Tracked Reduction Measures			
Energy Offset Measures				
	Renewable Energy Credits (REC's)			
	Bridal Veil RECs	$ 10,200.00	395,100	-869,200
	San Miguel Power Solar Farm - Paradox Valley			
	215 Panel Purchase* (Public Works and Transit Facility)	$ 190,787.00	84065	-162245
	373 Community Purchases*		145843	-281,476
	Carbon Sequestration (preservation of Open Space)			
	1026 acres within the municipal boundary	cost of land	n/a	-797191
	Onsite Net Meter (PV or Solar Hot Water Onsite)	n/a	57749	-111456
	Green Blocks			
	Community Purchases	$637,600	637600	-1230568
Direct Energy Generation				
	Onsite Solar Array			
	100 kW at the WWTP	$ 680,000.00	175506	-338727
SUBTOTAL				**-3,790,863**

***Updated and recalculated based upon Tri-State Factor referenced on p.19 of this report**

Note. Data provided by Karen Guglielmone, Town of Telluride, and Kim Wheels with EcoAction Partners.

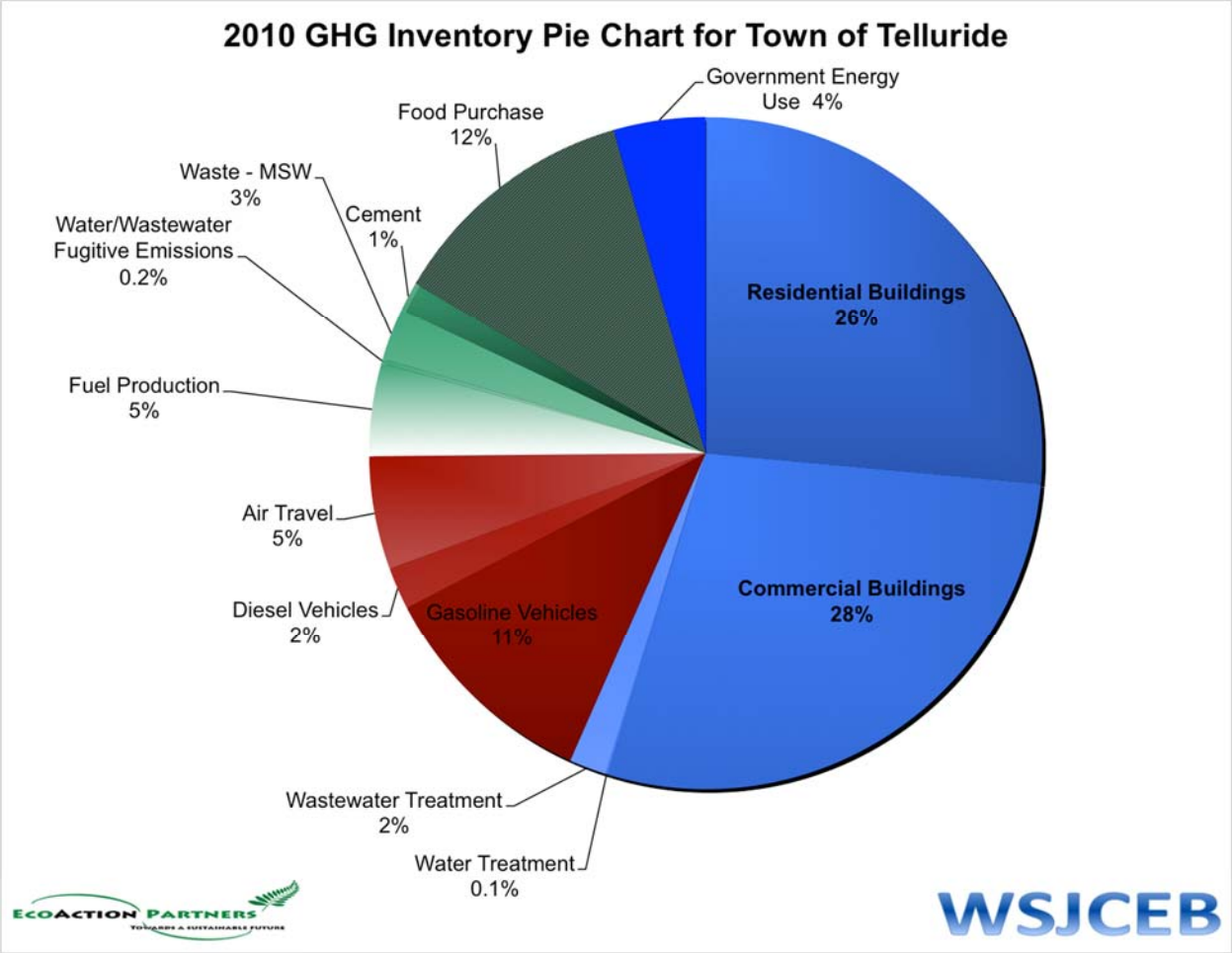
Appendix B

Summary of 2014 and 2015 Town Government and Community Carbon Tracking Measures

	Summary of 2014 and 2015 Town Government and Community Carbon Tracking Measures	Cost	Estimated Annual Electrical Generation (kWh)	CO2e Lbs Decrease
Energy Efficiency & Conservation				
	Water Conservation Plan			
	Treated Potable Water			-34260
	Waste Water			-162860
Energy Offset Measures				
	Renewable Energy Credits (REC's)			
	Ridgway Hydro RECs*	$ 130,000.00	13,000,000	-28600000
	San Miguel Power Solar Farm - Paradox Valley			
	464 Panel Purchase Affordable Housing Units (town government)	$ 320,160.00	181,424	-350148
	522 Community Panel Purchases (voluntary & includes purchases required by green building code)	n/a	204,102	-393917
Direct Energy Generation				
	Micro-Hydro			
	Pandora Water Treatment Plant	$ 600,000.00	1,530,000	-3366000
SUBTOTAL				**32,907,185**
	*Purchase for 3 years			

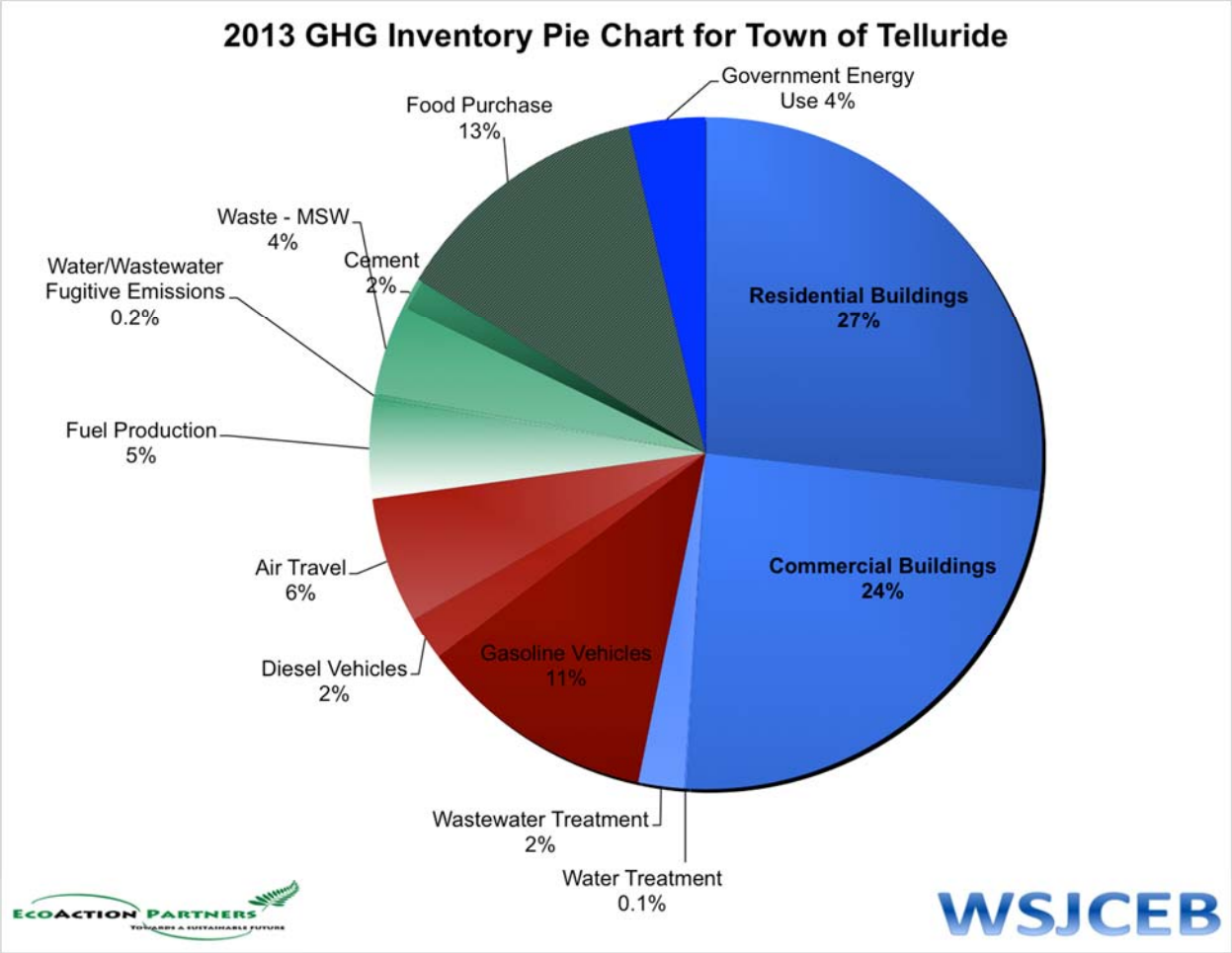
Data courtesy of Karen Guglielmone, Town of Telluride & Kim Wheels, EcoAction Partners.
*This is based upon the assumption that Renewable Energy Credit (RECs) purchases remain the same thru 2020.

Appendix C



Note. Pie Chart provided by EcoAction Partners & the Western San Juan Community Energy Board, (now known as the Sneffels Energy Board) for this report.

Appendix D



Note. Pie Chart provided by EcoAction Partners & the Western San Juan Community Energy Board, (now known as the Sneffels Energy Board) for this report.

Appendix E

Town Government Large Scale GHG Mitigation and Reduction Projects

- Purchase of solar panels at the SMPA Solar Farm in Paradox Valley, CO
- Purchase of micro-hydro power Renewable Energy Credits (RECs) at the Ridgway Dam, Ridgeway, Colorado and Bridal Veil Falls, Telluride, Colorado
- Installed on onsite solar array at the Waste Water Treatment Plant
- Installed micro-hydro power at the Pandora Water Treatment Plant
- Annexed large tracts of open space lands, in combination with other park lands that are held in either open space, open space conservation easement or park land zoning, having significant carbon sequestration[1] value of 1,026 acres in relationship to a community that is a total of approximately 1,418.3 acres.
- Implemented a Green Building Program in 2009, that requires 100% energy mitigation for heating exterior spaces, 100% offset of energy used in the construction of new homes, energy and water conservation requirements, insulation value requirements, boiler efficiency and window R-value requirements.
- Adopted a revised water rate study that financially penalizes excessive water use
- Adopted a Water Conservation Plan
- Supports housing mitigation requirements and a local affordable housing deed restriction program which reduces transportation related emissions because it reduces commuter miles
- Employs a local and regional public transportation program
- Purchased Green Blocks[1] from the local power company

A more comprehensive list of strategies can be found in the *Town of Telluride Government Facilities & Operations Annual Energy Audit: Energy Use & Carbon Footprint Summary (2013)* which was presented by Karen Guglielmone at the Town of Telluride Town Council regular meeting in Telluride, CO on April 1, 2014 and available through the town clerk's office.

[1] Green Blocks program is a San Miguel Power renewable energy initiative that allows members to purchase renewable energy credits (RECs) to offset their energy consumption. They cost $1.00 per block per month. One block represents 100 kilowatt hours of renewable energy. The average home uses approximately 800 kWh per month. (SMPA, 2014).

Appendix F

History of GHG Emission and Reduction Efforts in the Town of Telluride and Region

- 2003 the Town of Telluride begun tracking its energy use in an effort to reduce GHG emissions specific to its facilities and operations.

- 2005 the Town of Telluride endorsed the Mayor's Climate Protection Agreement to strive to meet the Kyoto Protocol target of a 7% reduction in overall greenhouse gas ("GHG") emission (within the municipal government buildings and operations) by the year 2012. This was achieved.

- 2006 Local Governments for Sustainability or International Council for Local Environmental initiatives (ICLEI) produced a Final Report: *San Miguel County Sustainability Inventory* in an effort to quantify local resources, sustainability identifiers and a work plan.

- 2007 a new local non-profit was formed "The New Community Coalition" now called "Eco-Action Partners" whose mission is to reduce GHG emissions through focusing on energy, food and waste. This organization is funded by three local governments: the Town of Telluride, Town of Mountain Village and San Miguel County along with ancillary funding sources (Town of Ridgway, City of Ouray, Ouray County, Town of Norwood, Town of Ophir).

- 2008 Wes Perrin (Affiliated with the San Miguel Power Association) produced for The New Community Coalition the *Greenhouse Gas Emissions Inventory of the Government Operations for San Miguel County and the Towns of Telluride and Mountain Village, Colorado.*

- 2009 the Town of Telluride ("Town") Town Council passed Resolution #10, Series 2009 ("Resolution") to commit to reduce Greenhouse Gas ("GHG") Emissions 20% by 2005 levels. Karen Guglielmone, Public works project manager and energy action coordinator for the town tracking energy data notes that the Resolution #10 was specific to the town government facilities and operations (4/1/2014); however, this is not specifically stated in the Resolution.

- 2009 The New Community Coalition received a grant from the Governor's Energy Office to form the Sneffels Energy Board (Western San Juan Community Energy Board or WSJCEB) a coalition inclusive of key regional community member.

- 2010 University of Colorado Denver in conjunction with The New Community Coalition (EcoAction Partners) produced the *Ouray and San Miguel County Greenhouse Gas Emissions Inventory & Sustainable Energy Benchmarking and Action 2010 (Published in July 2011).*

- 2010 *Alternative Futures for the Telluride Region* produced by the Telluride Foundation in cooperation with Harvard University Graduate School of Design and Massachusetts Institute of Technology.

- *2011 Strategy & Action Plan Collaborative Sustainability Action Plan & Implementation Methodology for Ouray and San Miguel Counties 2010-2020* produced by the Sneffels Energy Board.

- *2011 Telluride's Climate Action Plan Overview 2012-2020* – A working draft developed by Karen Guglielmone, Public Works Project Manager & Telluride Energy Action Coordinator.

- *2013 Energy Use and Carbon Footprint Summary Town of Telluride Government Facilities & Operations Annual Energy Audit.* Ms. Guglielmone notes recommends that the Town compete a Climate Action Plan for the Town of Telluride that encompasses projects and goals for the entire community, not just the Town Government.

Appendix G

ICLEI-Europe CCP 5-milestone methodology

The universal approach of the CCP Campaign is called the CCP 5- milestone methodology. This is presented as a simple cycle, but contains multiple actions within each step – both for mitigation and adaptation. The cycle is implemented once, and then repeated until climate neutrality is achieved (optimizing mitigation efforts, off-setting final GHGs, and adaptation to improve community resilience as far as is possible).

Overview	Mitigation:	Adaptation:
Milestone 1	Establish an inventory baseline and business-as-usual (BAU) forecast	Identify climate impacts and conduct a climate vulnerability / opportunity / resilience assessment)
Milestone 2	Adopt an emissions reduction target for the forecast year	Identify relevant adaptation strategies and implementation timeframe
Milestone 3	Develop and adopt a short-to-long-term Local Action Plan (LAP)	Prioritise areas for action & develop a Local Action Plan
Milestone 4	Implement the LAP (Local Action Plan)	Implement policies, systems improvements & adaptation measures
Milestone 5	Monitor, evaluate & report on results	Monitor, evaluate & report on results

Note. Courtesy http://www.iclei-europe.org/ccp

Appendix H

GHG Inventory Per Person and Population -Visitor Data Included

Greenhouse Gas Inventory Per Person and Population based upon UCD Worksheets

Description of Benchmark	Telluride, CO (2010)	Telluride, CO (2011)	Telluride, CO (2012)	Telluride, CO (2013)	Units of Measurement
Avg. Res. electricity use	830	849	807	823	kWh/hh/mo
Avg. Res. Natural gas use	80	83	63	81	therms/hh/mo
Avg. Comm/ Ind./ Pub. Buildings Energy use intensity	389	325	218	318	Kbtu/ft²/year
Vehicle Miles per person per day	26.0	26.0	26.0	25.6	VMT/person/day
Water supply	180	203	193	193	gallons/person/day
Municipal Solid Waste	4.3	7.0	6.9	6.9	lb/person/day
GHG Emissions per person	**35.5**	**35.4**	**32.9**	**33.1**	**Mt-CO_2e/person/year***
GHG Emissions with Visitors*	**31.7**	**31.7**	**29.5**	**29.6**	**Mt-CO_2e/person/year**
GHG Emissions per population	**82,537.50**	**83,827.20**	**78,828.40**	**79,307.60**	**Mt-CO2e/population/year****
Census population data per year	2325	2368	2396	2396	

Note. Table Courtesy of EcoAction Partners, adapted and produced for this report.
*Visitor GHG Emission Data included. The data used in the report consisted of GHG Emissions per person x census population data to derive GHG Emission per population.

Appendix I

Coursework Relevance

This capstone project incorporates many key public administration concepts learned throughout the master's in public administration degree program, namely: PUAD 5250 Intergovernmental Management, PUAD 5005 Law and Public Policy, and PUAD 5006 Leadership & Professional Ethics.

PUAD 5250 Intergovernmental Management

The Town of Telluride government endorsed the U.S. Conference of Mayors' Climate Protection Agreement and joined the Local Governments for Sustainable Cities for Climate Protection Program. These initiatives began with the international Kyoto Protocol agreement which endures by setting and adjusting GHG emission reduction goals internationally. Former President George W. Bush rejected the Kyoto Protocol in 1997 while European nations lobbied for more aggressive reduction efforts. Soon after and while still President, Hurricane Katrina devastated the New Orleans region, bringing climate change realities back to the surface if not politically, than socially. The federal government is large, complex, politically contentious and it "has experienced considerable difficulty in reaching consensus on new initiatives or in revising much earlier legislation" (Conlan & Posner, 2008, p.177). This has been evident as it relates to Climate Action legislation and Greenhouse Gas reduction legislation at the federal level. As noted by the scholarly literature section of the capstone paper, local and state level government is often more effective creating legislation and piloting programs to a degree more successfully than the federal government. In spite of top down political challenges, climate change is "impossible to deal with, yet impossible to ignore" (Kitchell, 2012). Like many environmental movements, the bottom-up approach may be the most effective means to influence mitigation of

climate change realities. "Almost eerily, there has been stunningly little constructive conversation between increasingly active states and continually disengaged federal entities such as regulatory agencies and Congress" (Conlan and Posner, 2008, p. 201). Heifetz (1994) notes in *Leadership Without Easy Answers*, that complex problems often cause system failures. Denial of climate realities will only result in compounding global problems such as a lack of adequate disaster recovery plans, lack of forethought and modeling of climate realities, lack of budget, lack of back up plans, or lack of adequate assessment of environmental conditions.

Federal and state goal setting, ideally, however, is one way that the layers of government act interdependently. Federal and state grant funding helps the state and local governments select goals by lowering the cost of pursuing specific objectives, identify, strengthen and create local goal allies. "By applying for a grant, state and localities indicate their shared interest in a problem that concerns the federal government (Conlan & Posner, 2008, p. 225). For example, the Colorado Governor's Energy Office provided grant funding to create the Ouray and San Miguel County initial GHG inventory method, worksheets and strategies for the region as well as initially funded the formation of the Sneffels Energy Board, a multi-jurisdictional coalition with a mission to set and accomplish regional sustainability goals. EcoAction Partners continues to monitor federal and state funding opportunities and works closely with the local power utility company, regional governments and offer programs for the public. Although often referred to as a layer cake, the layers of the United States government system is more akin to a "marble cake" (Kettl & Fesler, 2009, p.53) in that there are both top down influences and bottom up influences.

PUAD 5005 Law and Public Policy

Non-profit and private organizations are handling more responsibilities otherwise previously handled by the local governments. "At the state and local levels, the practice of contracting out public services has grown into a major feature." (Kettl & Fesler, 2009, p.384) This is seen at the Telluride town government local level in that the Town Council recently debated the pros and cons of providing the yearly $50,000 (since 2007) to EcoAction Partners for their services versus provision of the same services in-house. Typically the justifications for contracting some services include reduced costs, special expertise and/or avoidance of red tape (Kettl & Fessler, 2009). However, the EcoAction Partners provides a regional service with special expertise and acts in the role of assistance and support. In addition to facilitating the regional Sneffels Energy Board, the EcoAction Partners also facilitates intergovernmental communication regarding GHG emissions issues.

PUAD 5006 Leadership – Professional Ethics

In our evolving world, challenges are complex requiring a different leadership style, known as adaptive leadership. Climate realities require planning, direct action and cooperation. The ability for community leaders to have appropriate responsiveness to particular issue requires the following strategies outlined by Heifetz (1994) in *Leadership without Easy Answers*, such as getting ahead of the curve, to anticipate the possible range of problems and address solutions and framing the issue so that the public and your team can understand the problem in the right context, are strategies and tools to achieve better success with any pressing and complex issue facing a community . Getting the right people on the bus is a term and strategy outlined by the author of *Good to Great*" (Collins, 2001), another strategy to forming successful adaptive teams. Two key concepts are that people become motivated by issues and behavior modification when a

threat is perceived and that crisis management requires immediate adaptive skills. Climate realities will require a different type of vision, a different type of leader, and a different type of regulatory framework. Heifetz notes that identifying an adaptive challenge means regulating distress, focused direct disciple attention to the issue, giving the work back to the people at a rate they can manage, and protecting the voices of leadership in the community (Heifetz, 1994).

There is nothing more relevant than an adaptive leader's role while a community is faced with the unpredictable challenges of global warming. Public administrators are required to adapt, problem solve, and build consensus, when doing their job successfully. Even if a community may struggle or even deny a complex issue, the role of an adaptive leader is willing to address the problem. Heifetz notes that complex issues often causes system failures, that people fail to adapt for a few reasons including that they may misperceive the nature of the threat and people can respond only to those threats that they see (1994).

> "Innumerable human tribes and organizations have disappeared with the onslaught of disease, environmental challenge, invasion or competition because they could not develop the ability or find the means to adjust appropriately" (Heifetz, 1994).

Finally people fail to adapt because of the distress provoked by the problem and the changes it demands. Often denial is easier and feels less stressful than facing and taking responsibility for a complex challenges.

Conclusion

The role of local government and civil service in particular requires an ethical standard that the needs of the people are held above the needs of oneself. "The question for us is, how shall our series of governments within governments be so administered that it shall always be to

the interest of the public officer to serve, not his superior alone but the community also, with the best effort of his talents and the soberest service of his conscience?" (Schafritz & Hyde, 2007, p.27). Additionally, all public organizations must balance goals and constraints, and as Kettl & Fesler note, the balance leans toward the constraints. "With more constraints, government sometimes struggles to accomplish the objectives that policymakers set for it." (2009). The ability for the Telluride region to have the means to meet its existing 20% by 2020 is a great achievement. The ability to model an equally resilient community by the provision of more energy conservation measures, continued support of energy offsets and onsite energy generation, reducing waste and increasing local food production will further achieve the goals and aims of a successful CAP and will require continued intergovernmental relations, cooperative relations with partners such as non-profits, adaptive leadership skills, and placing the needs of the community above the needs of oneself as public administrators.