

**2020**

**Greenhouse Gas (GHG)  
Emissions Inventory**

**for the  
Town of Telluride, Colorado**



Prepared by Karen Guglielmon  
Environmental & Engineering Division Manager  
Telluride Public Works Department

Supported by Kim Wheels, EcoAction Partners

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## Executive Summary

In 2020 – this year—the format for this report and presentation of all GHG emissions for the Telluride Community and the Telluride Government were brought into alignment with accepted global protocols. Specifically, this 2020 inventory and each inventory through 2029 will follow the methodologies found in the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities* (GPC, 2014), which was produced by the World Resources Institutes, the C40 Cities, and ICLEI – Local Governments for Sustainability. This change is taking place because while Telluride was working at reducing its greenhouse gas emissions and moving toward a more sustainable future, methodologies that would allow comparisons among entities and allow small inventories like our own to serve as feedstock to larger state, federal, and global inventories were updated, solidified, and agreed upon. 2020 is a good year to make this shift and start a new decade of accounting and analysis.

It is important to note that the goal for the community and the government to become a carbon neutral (and even carbon negative) entity has not changed. In fact, an important purpose of Telluride's updated Climate Action Plan is to establish a timeframe for meeting that goal, along with interim milestones. That plan will be vetted and hopefully adopted in spring 2022.

Meanwhile, this inventory is intended to keep track of whether the community and the government are making progress in reducing greenhouse gas emissions while increasing the economy levels of service. Neither entity is succeeding to date; although, neither is losing ground. In 2020, total calculated GHG emissions for the Telluride Community, including government, were approximately 70,500 metric tons of CO<sub>2e</sub>. Government operations and facilities alone generated 3,208 metric tons of CO<sub>2e</sub>.

Clearly, a major change in focus and funding is needed to actually reduce GHG emissions. For now, efforts by Town Government and the Telluride Community continue as they have for over 15 years—by looking for opportunities presented by new technologies, new ideas, and renewed enthusiasm within the community to enact change. Our increasing portfolio of renewables, support of local renewables by purchasing energy credits, and consistent improvements in energy efficiency are a testament to our dedication. It is time to step up these already impressive efforts.

## Part 1 – An Introduction & History

2020 is an important year for the Town of Telluride greenhouse gas (GHG) inventory. It is a year of transition. It is a year when this report and all calculations of GHG emissions for the Telluride Government and the Telluride Community are brought into alignment with accepted global protocols. Specifically, this 2020 inventory and each inventory through 2029 will follow the methodologies found in the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities* (GPC, 2014), which was produced by the World Resources Institutes, the C40 Cities, and ICLEI – Local Governments for Sustainability. This change is not taking place because previous analyses were wrong. It is taking place because while Telluride was working at reducing its greenhouse gas emissions and moving toward a more sustainable future, methodologies that would allow comparisons among entities and allow small inventories like our own to serve as feedstock to larger state, federal, and global inventories were updated, solidified, and agreed upon. 2020 is a good year to make this shift and start a new decade of accounting and analysis.

Town of Telluride staff first started tracking the greenhouse gases (GHGs) generated by its operations in 2003 after engaging professional consultants to perform an energy audit of Town facilities. The consultant report recommended many actions to improve energy efficiency, most of which were implemented over the following year. Each year thereafter, the scope of the analysis became more inclusive and sophisticated. In a memorandum to Town Council dated August 27, 2006, the Town Manager's Office wrote:

*“Progress has been made in the Town’s energy conservation efforts, but analysis shows that we need to make an even more intensive effort throughout our departments and facilities in order to meet the goal set forth in the Mayor’s Climate Protection Agreement, signed by the Town of Telluride, and in the Aspen Canary Initiative, supported through a 2005 Town Council Resolution. These programs direct the Town to strive to meet the Kyoto Protocol target of a 7% reduction in overall greenhouse gas [GHG] emissions by the year 2012.”*

In 2009, Town officials raised the bar by formally adopting by resolution the Colorado Climate Action Plan 2020 Goal of reducing GHGs emissions 20% from 2005 levels by 2020. The Town took this step to recognize that global warming poses ongoing, significant environmental and economic risks to San Miguel County, the Town of Telluride, and the American West, as a whole. This resolution officially expanded the goal of lowering GHGs from Town Government facilities and operations to lowering GHGs from the broader community, as well. At its May 8, 2017, meeting, Town Council raised the bar once again, changing the goal for Town Government facilities and operations and the Telluride Community to become “carbon neutral.” This 2020 summary will reflect where the Town Government and the Telluride Community are 3 years after this new, tougher mandate.

Part 2 of this document explains the methods used to develop this GHG inventory. This accounting and reporting of the Telluride community's GHG emissions uses the principles stated in the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories* (2014) to represent a fair, true and comparative account of emissions.

Part 3 of this document details the community's GHG emissions from 2010 through 2020 and summarizes accomplishments of the Telluride Community in terms of energy efficiency, on-site and off-site generation of renewable energy, purchase of renewable energy credits, and Green Building requirements. Staff has attempted to make this summary comprehensive. It details our current understanding of trends and individual efforts within the Telluride Community. Hopefully, community members will look at this section and be inspired to take additional actions to lower their GHG emissions.

Part 4 of this document details the government's GHG emissions and is intended to inform the Manager's Office, Telluride Town Council, and the public about the Town Government's ongoing efforts at its facilities and operations to be “carbon neutral.” This goal is absolute and is not based on population or level of service, which makes it a significant challenge. Investing in renewable energy sources as a

complement to energy efficiency measures continues to be a winning strategy for the Telluride Government and the region.

Of course, government GHG emissions are estimated to be approximately 2 percent of the total emissions generated by the Telluride Community and therefore a much broader and more difficult to implement community-based effort is needed. To help ensure this broader effort gains momentum, Telluride Government has first set the example by dedicating funding and staff time to improve the long-term sustainability of its operations. Second, it works with EcoAction Partners to develop a GHG emissions inventory and reduction plan for the Telluride Community that establishes short and long-term GHG reduction targets and policies and programs to achieve those targets. Next, Telluride's Ecology Commission and staff has been working with Cascadia Consulting to update the community's Climate Action Plan, developing a schedule and targeted actions to move definitively toward being "carbon neutral". Perhaps someday the community can become "carbon negative". In addition, San Miguel Power Association (SMPA) is an important partner and source of technical expertise, promoting regional energy efficiency and creating opportunities for our region to create renewable sources of electricity. Likewise, Black Hills Energy is working on creating similar opportunities for efficiency of natural gas use.

Part 5 of this document summarizes recommendations for decisionmakers to consider implementing for 2021 and 2022 to continue progress in reducing GHG emissions and moving the government and community toward its goal of being carbon neutral.

## Part 2 – The Method Used to Develop this GHG Inventory

### ACCOUNTING & REPORTING PRINCIPLES

Accounting and reporting for community GHG emissions is taken from the principles stated in the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories* (2014) to represent a fair, true and comparative account of emissions.

#### **Relevance**

The reported GHG emissions will appropriately reflect emissions generated by activities and consumption patterns of the Town of Telluride. The inventory will also serve the decision-making needs of the Town, taking into consideration relevant local, subnational, and national regulations. The principle of relevance applies when selecting data sources and determining and prioritizing data collection improvements.

#### **Completeness**

The Town will account for all required emissions sources within the inventory boundary. Any exclusion of emission sources shall be justified and clearly explained. Notation keys shall be used when an emission source is excluded, and/or not occurring.

#### **Consistency**

Emissions calculations will be consistent in approach, boundary, and methodology. Using consistent methodologies for calculating GHG emissions enables meaningful documentation of emission changes over time, trend analysis, and comparisons between municipalities. Calculating emissions will follow the methodological approaches provided by the GPC. Any deviation from the preferred methodologies will be disclosed and justified.

#### **Transparency**

Activity data, emission sources, emission factors, and accounting methodologies require adequate documentation and disclosure to enable verification. The information will be sufficient to allow individuals outside of the inventory process to use the same source data and derive the same results. All exclusions will be clearly identified, disclosed and justified.

#### **Accuracy**

The calculation of GHG emissions will not systematically overstate or understate actual GHG emissions. Accuracy will be sufficient to give decision makers and the public reasonable assurance of the integrity of

the reported information. Uncertainties in the quantification process have been reduced to the extent that it is possible and practical.

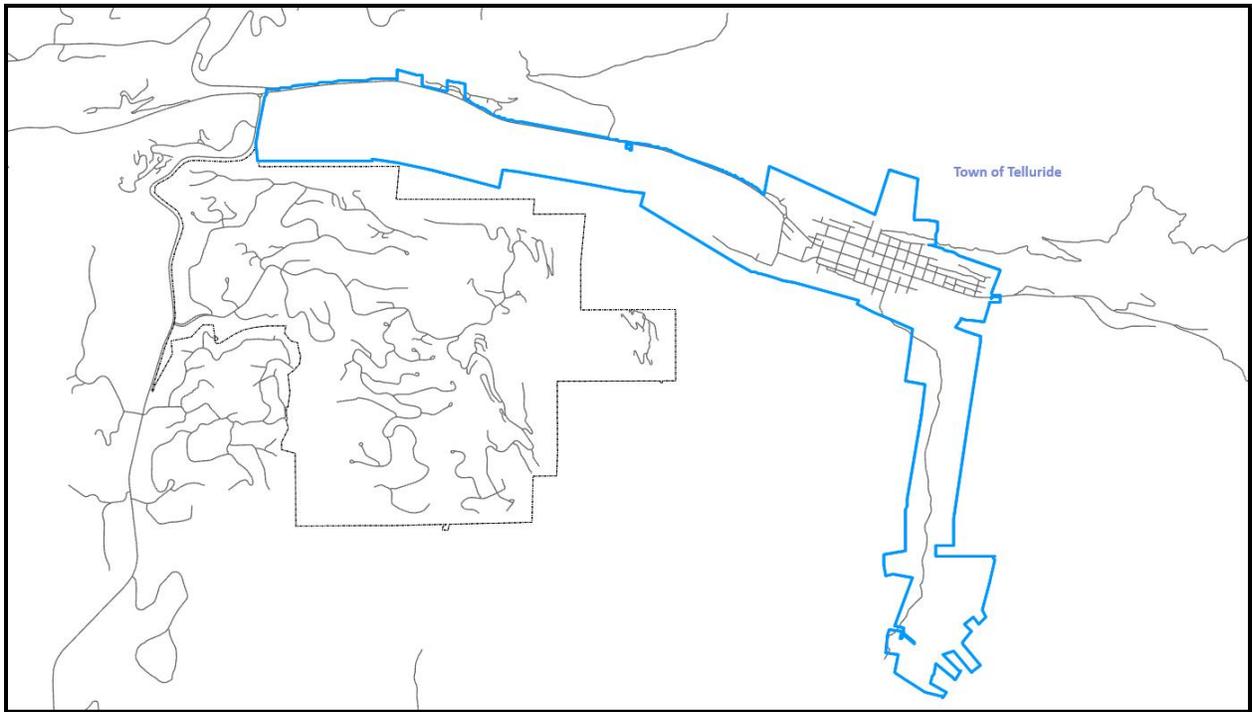
Data for the inventory comes from a variety of sources and varies in quality, format, and completeness. To accommodate limits in data availability and differences in emission sources between cities, the GPC requires the use of notation keys. Where notation keys are used, the Town will provide an accompanying explanation to justify exclusions or partial accounting of GHG emission source categories. Table 1.1 explains these notations.

**Table 1. Use of notation keys**

<b>Notation Key</b>	<b>Definition</b>	<b>Explanation</b>
<b>IE</b>	Included Elsewhere	GHG emissions for this activity are estimated and presented in another category of the inventory. That category will be noted in the explanation.
<b>NE</b>	Not Estimated	Emissions occur but have not been estimated or reported; justification for exclusion will be noted in the explanation.
<b>NO</b>	Not Occurring	An activity or process does not occur or exist within the Town boundary.
<b>C</b>	Confidential	GHG emissions that could lead to the disclosure of confidential information and can therefore not be reported.

## INVENTORY BOUNDARY

The boundary used for this inventory is the geographic boundary of the Town of Telluride itself. This is shown in Figure 1.



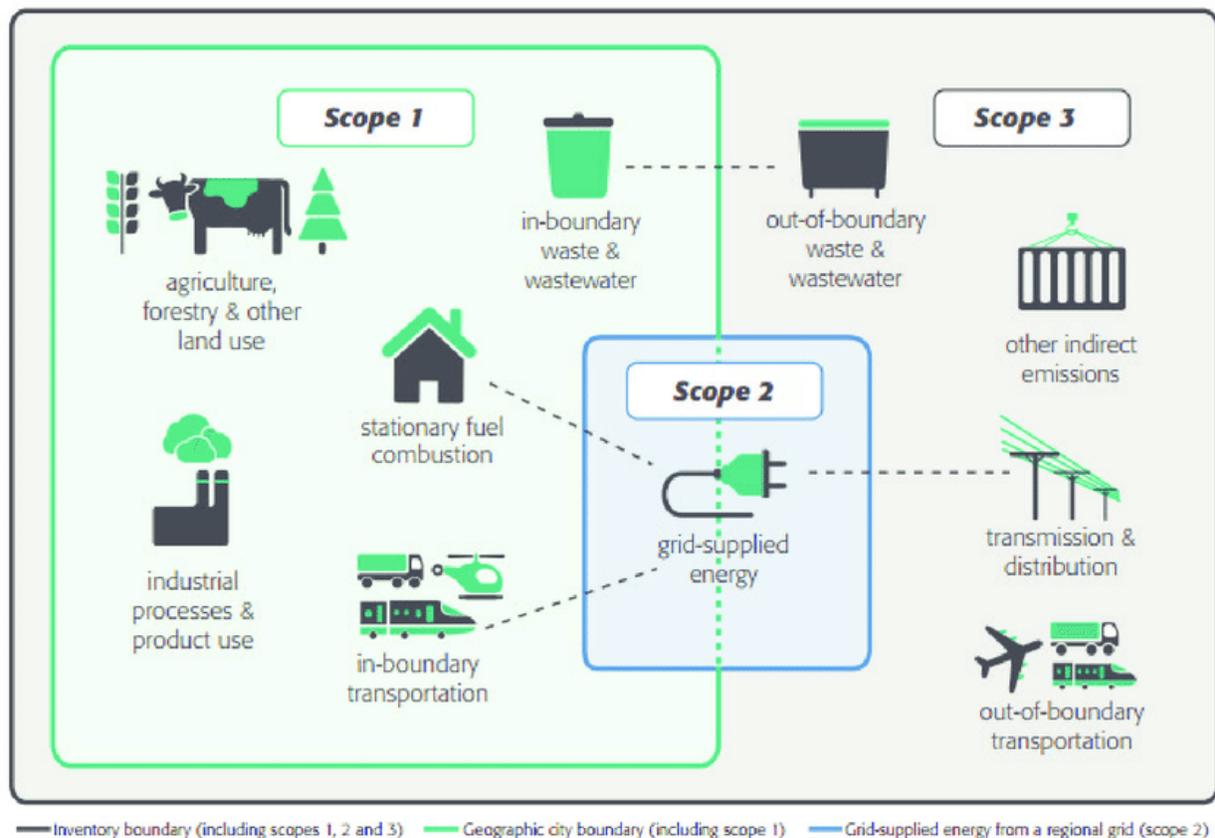
**Figure 1. Geographic boundary used for the Town of Telluride community greenhouse gas emissions inventory.**

## CATEGORIZING EMISSIONS BY SCOPE

Activities taking place within the Town of Telluride boundary can generate GHG emissions that occur inside the city boundary as well as outside the Town boundary. To distinguish between these, the GPC groups emissions into three categories based on where they occur: Scope 1, Scope 2, and Scope 3.

**Table 2. Scopes definitions for Town of Telluride Inventory**

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



**Figure 2. Sources and boundaries of Town of Telluride GHG emissions**  
(source: Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories)

## GHG ACCOUNTING CHANGES

EcoAction Partners is in the process of converting our community GHG Inventory calculation methodology to ICLEI's ClearPath online GHG tracking and analysis tool, the leading online platform for complete GHG inventories, forecasts, climate action plans, and monitoring at the community-wide or government operation scales. In 2022, the Telluride government GHG Inventory will be tracked in ClearPath as well. By using ClearPath, the government's and the community's GHG inventories can be directly compared to those of other cities and communities across the U.S., and around the world,

including a number of similar rural mountain communities. Additionally, ClearPath provides GHG forecasting and tracking tools that will help guide and track GHG reductions.

With this transition the 2020 GHG Inventory will very clearly depict emissions associated with Scope 1 and 2 boundaries, separately from Scope 3 emissions. Thus, the following sources of emissions will continue to be included in the GHG Inventory, but will be labeled as Scope 3:

- Water and Wastewater - pumping and treatment located outside of town boundaries
- Telluride Regional Airport – located outside of town boundaries. 50% of air travel in/out of this airport is currently assigned to Telluride, in accordance with a tri-jurisdictional meeting held by EcoAction Partners in 2018.
- Montrose Regional Airport - 65% of MTJ travel is associated with San Miguel County. Currently, 50% of that is currently assigned to Telluride, in accordance with a tri-jurisdictional meeting held by EcoAction Partners in 2018.
- Waste - landfill and recycling materials transported outside of the town and county boundaries.
- Food – almost all food consumed within Telluride is imported from outside of town boundaries.
- Fuel, cement, and other material supplies – these materials are produced outside of town boundaries and imported for use.

In addition, the Telluride Community's GHG Inventory from 2020 forward will no longer reflect a reduction in electricity emissions associated with RECs or other carbon reduction offsets. Thus, the Town's annual purchase of RECs from the Ridgway Hydro Dam, Green Blocks purchased by community members, and ownership of panels at SMPA's community solar farm will not directly reduce GHG emissions. Progress with these activities will continue to be calculated separately in order to track and understand the success of our policies, programs and actions.

Renewable energy credits (RECs) have been part of our strategy for supporting renewable energy. While RECs are not a guarantee that additional renewable energy is produced that would not have been produced otherwise and RECs do not actually reduce Telluride's GHG emissions, purchasing RECs is a first step to demonstrate public demand and commitment to renewable energy, while we work to install local renewable energy sources. REC purchases are also not restricted by SMPA's contract with Tri-State, while non-net metered local renewable energy production is currently limited. Thus, RECs have been and will continue to be part of our strategy moving forward.

## Part 3 – Community GHG Emissions & Mitigation Efforts

### BASIS FOR COMMUNITY GHG INVENTORY

#### Base Year

Setting a base year is important for understanding progress in meeting GHG emissions goals. It is the benchmark against which future emissions are compared. The Telluride Community GHG inventory base year is 2010.

#### Time Period

The Telluride Community GHG Inventory covers 12 months aligning to the calendar year from January 1 through December 31.

### COMMUNITY GHG EMISSIONS

Figure 3a and 3b present the 2020 GHG emissions summary – approximately 70,500 metric tons CO<sub>2e</sub> – generated by the Telluride Community, including the government. Energy use by buildings, whether commercial or residential, remains the most significant contributor to GHG emissions, when compared to other emissions sources. This is not surprising considering the steady increase in square footage of buildings within the Town's jurisdiction, as shown in Figure 4. Note that GHG emissions by Town Government, which is shown as the bright yellow slice, is only 2.0% of the total.

Figure 5 presents the electric energy use by the Telluride Community, including government, from 2010 through 2020. Electric use averaged approximately 36 million kilowatt-hours between 2010 and 2016. Average usage dropped to approximately 34.5 million kilowatt-hours between 2017 and 2020. Figure 5 breaks the data into renewable energy source types and non-renewable energy. An important observation when considering these data is that electricity use by the Telluride Community appears to have decreased slightly on average since 2017, despite the continued steady increase in economic activity. This can be attributed to implementation of efficiency measures and renewables.

## PUBLIC TRANSPORTATION: THE GALLOPING GOOSE

Galloping Goose operations were impacted once again in 2020. This time, transit service provided by the Galloping Goose to residents and visitors throughout the Town was completely suspended in April and May in response to the COVID-19 pandemic. Capacity throughout the rest of the year was also greatly curtailed to better ensure public health and safety.

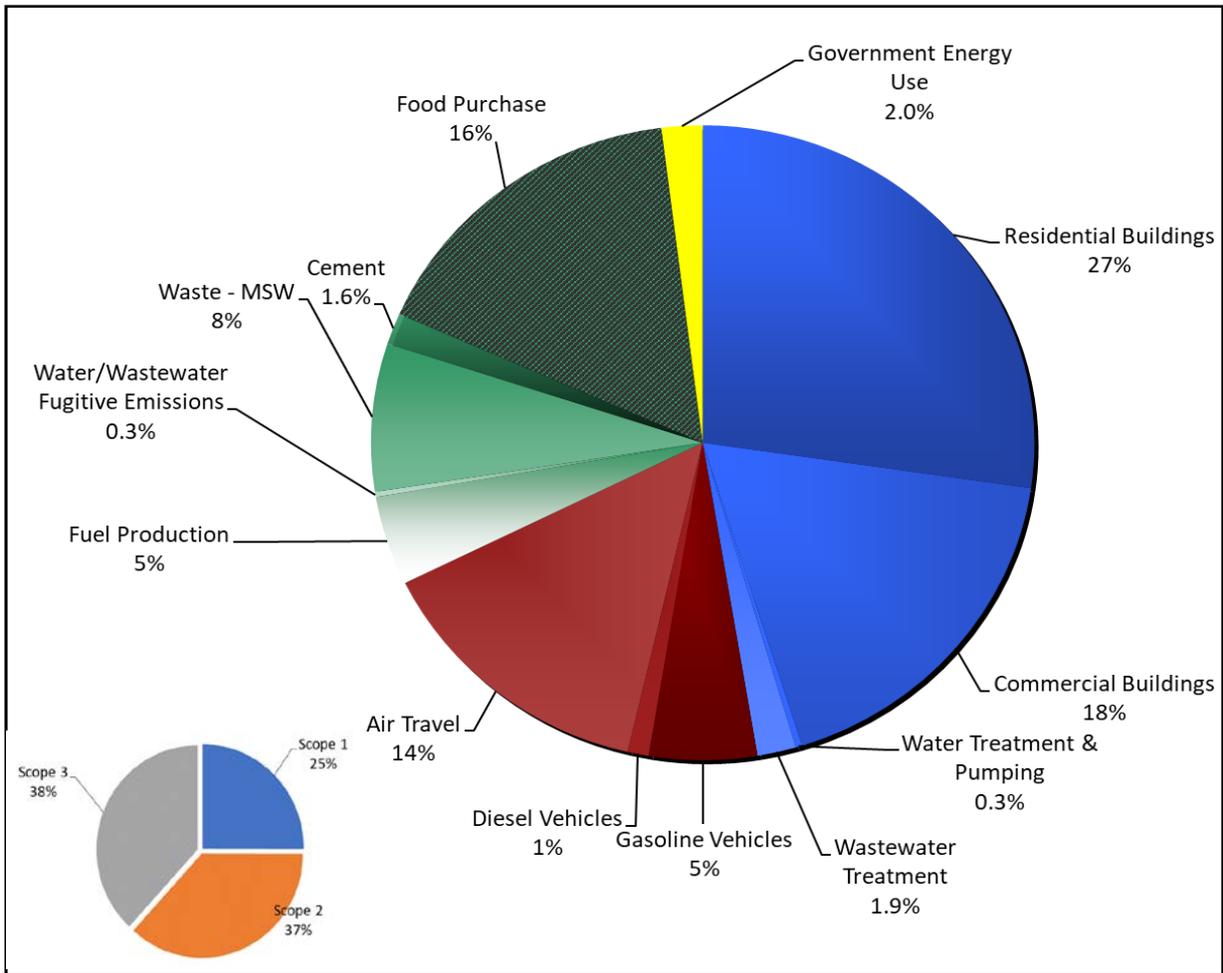


Service was provided within Town of Telluride with 3 buses running a loop. In 2020, Galloping Goose ridership was less than in 2005 by 16%, which is equivalent to about 34,000 riders. 2020 fuel use by the Galloping Goose was less than in 2005 by 53%. A separate analysis of the greenhouse gas emissions (i.e., CO<sub>2e</sub>) that would have been generated if each rider had driven separately to his/her destination in 2020 versus the CO<sub>2e</sub> generated by the Goose indicates there was **an overall savings of 104 metric tons of CO<sub>2e</sub> associated with public transit in the Town**. Figure 6 presents the Goose Ridership versus GHG emissions saved as a result from 2005 through 2020.

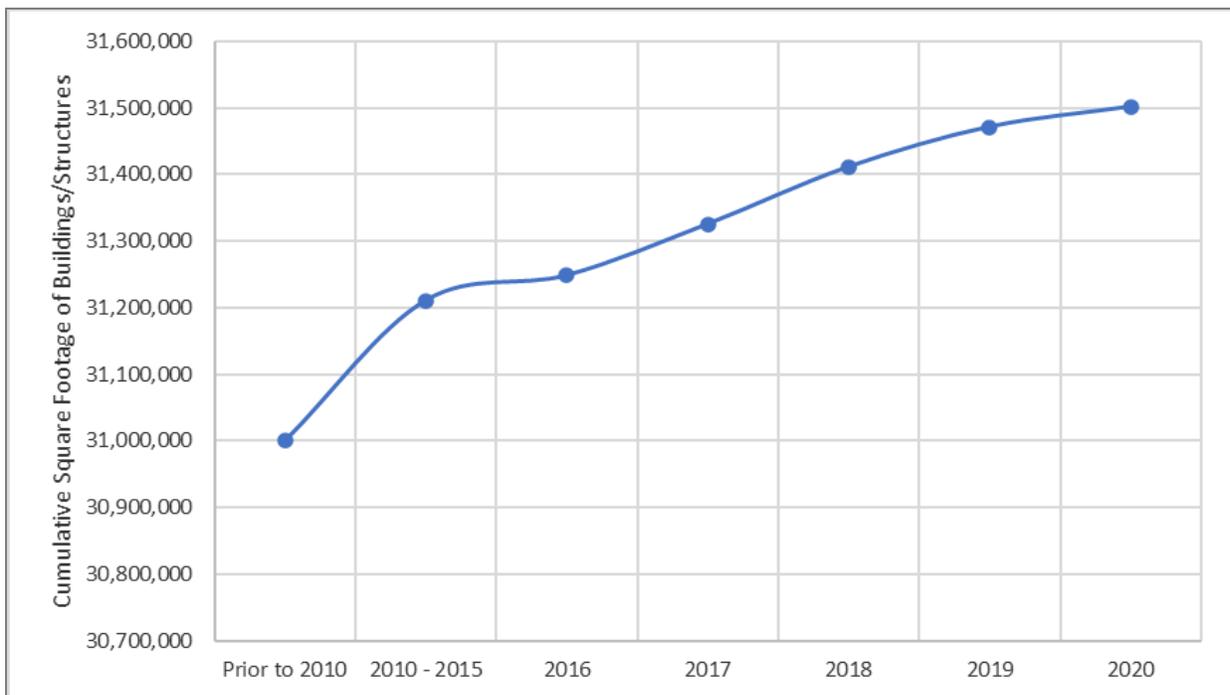
Carbon offsets were not sought in 2020 or 2021. They may be considered in 2022. In 2017, 2018, and 2019 GHGs generated by operating the Galloping Goose were offset by purchasing third party verified agricultural-based carbon offsets through an innovative partnership between the Telluride Foundation and The Pinhead Climate Institute. These carbon offsets were generated by a Colorado farm. Remember that riding the Goose has numerous benefits beyond just decreasing GHG emissions. These include reducing traffic congestion, reducing air pollution, and now assisting a Colorado farmer to place his land in a conservation easement.



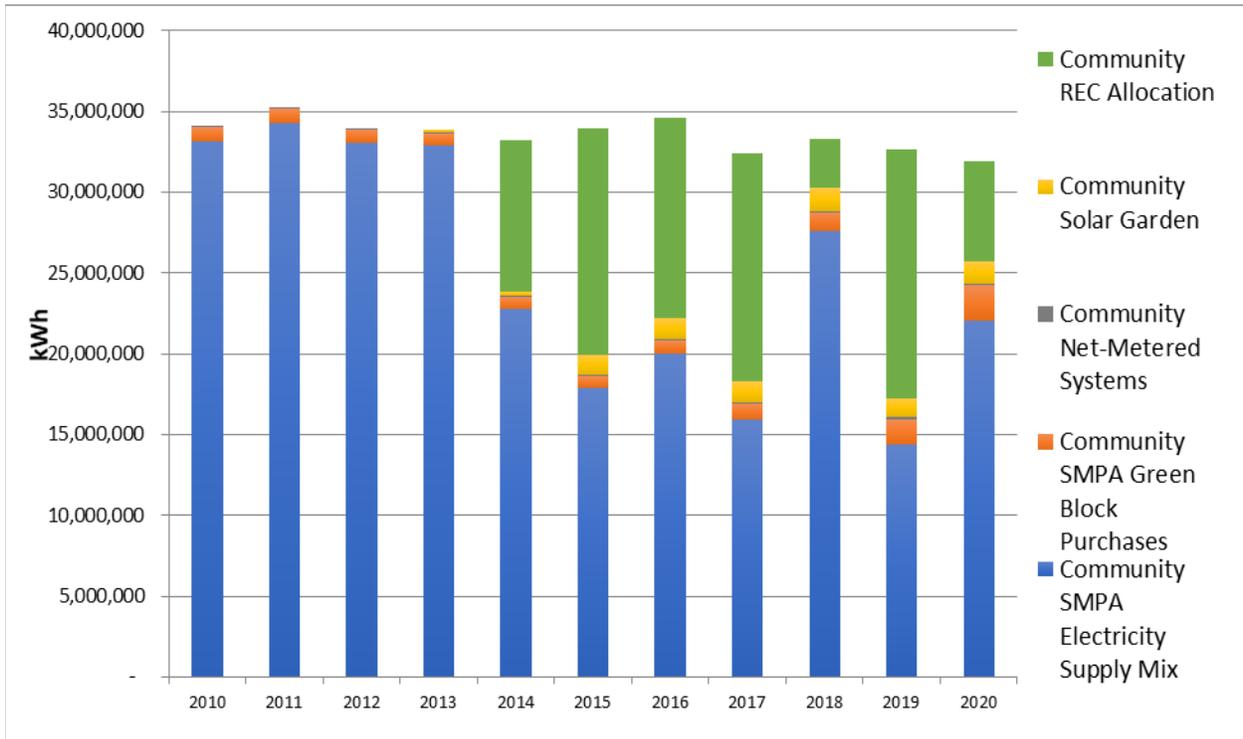
Figure 3a. GHG emissions (mTCO<sub>2e</sub>) from the Telluride Community & Government from 2010-2020 (source: EcoAction Partners).



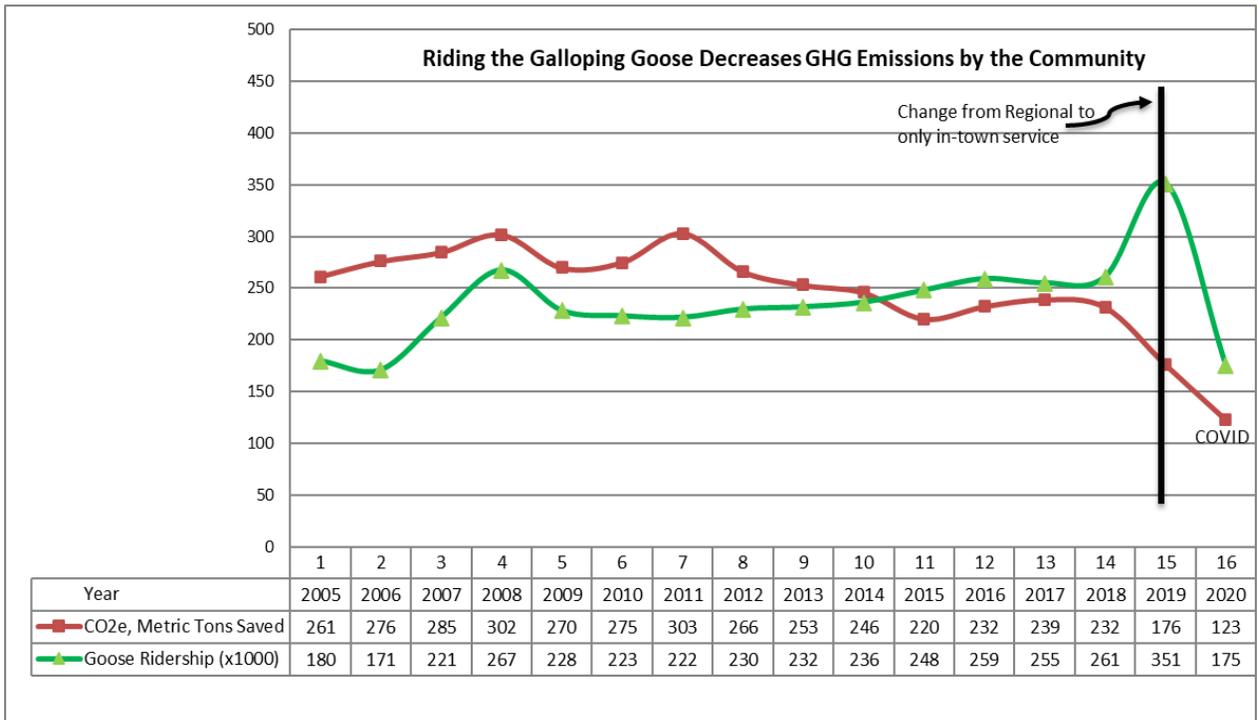
**Figure 3b. 2020 GHG emissions (approximately 70,500 metric tons) by the Telluride Community & Government (source: EcoAction Partners).**



**Figure 4. Cumulative square footage of buildings within the Town of Telluride.**



**Figure 5. Electricity use by the Telluride Community (kWh), including government, from 2010 – 2020 (Source: EcoAction Partners and San Miguel Power Association).**



**Figure 6. Goose Ridership versus CO<sub>2</sub>e emissions saved as a result from 2005 – 2020.**

## RENEWABLE ENERGY

All data show that the community supports renewable electricity generation in a variety of forms, including SMPA Green Blocks, the Paradox Community Solar Garden, and net-metering. For this 2020 report, SMPA tracked the kWh produced by the Telluride Community (non-government) based on net-metered systems, SMPA Green Block purchases, and through the Paradox Community Solar Garden. The Telluride Community owns 3582 panels at the Solar Garden, which produced approximately 348 kWh per panel. The large increase in generation from the Paradox Community Solar Garden from 2014 to 2015 reflects the Telluride School District's purchase of solar photovoltaic panels in the Garden.

Table 3 and Figure 7 present the community renewables data to date. These numbers are important to help us more fully understand the Community's progress toward greater sustainability. The Town of Telluride's Green Building Code, which was adopted in 2010 requires 100% offset of electricity use for new construction using one of these three methods.

**Table 3. Renewable Energy Generation and Purchases (kWh) by the Telluride Community (non-government), and Ridgway Dam Hydro RECs Transferred from Telluride Government**

Year	Net-Metered On Site Systems	Paradox Community Solar Garden	Last Dollar Community Solar Garden	SMPA Green Blocks (Local RECs) Purchases	Ridgway Dam Hydro (Local) RECs Transferred from Telluride Government	Total, kWh	Total GHG Emissions Reduced, Metric Tons
2010	49,224	0		908,344	0	957,568	921
2011	49,224	0		866,538	0	915,762	881
2012	58,156	0		749,200	0	807,356	718
2013	57,749	146,064		637,600	0	841,413	737
2014	73,270	301,992		630,800	8,958,634	9,964,696	8,995
2015	67,297	1,352,207		827,372	13,526,415	15,773,291	13,379
2016	65,289	1,396,185		912,700	11,899,659	14,273,833	12,107
2017	96,233	1,367,823		958,800	13,584,552	16,007,408	13,578
2018	98,020	1,482,932		1,292,070	2,508,222	5,381,244	4,565
2019	122,541	1,247,909		1,666,338	14,879,471	17,916,259	15,197
2020	106,015	1,408,828	269,433	2,228,036	5,672,011	9,684,323	8,214
TOTAL	843,018	8,703,940	269,433	11,677,798	71,028,963	92,523,152	79,291

a Projected on-site generation based on capacity

b In 2014, 90% of RECs purchased by Telluride Government were assigned to the Community for GHG Emissions accounting purposes. This is equivalent to a \$13,095.00 grant.

c This is equivalent to 373 panels purchased by the Community at large

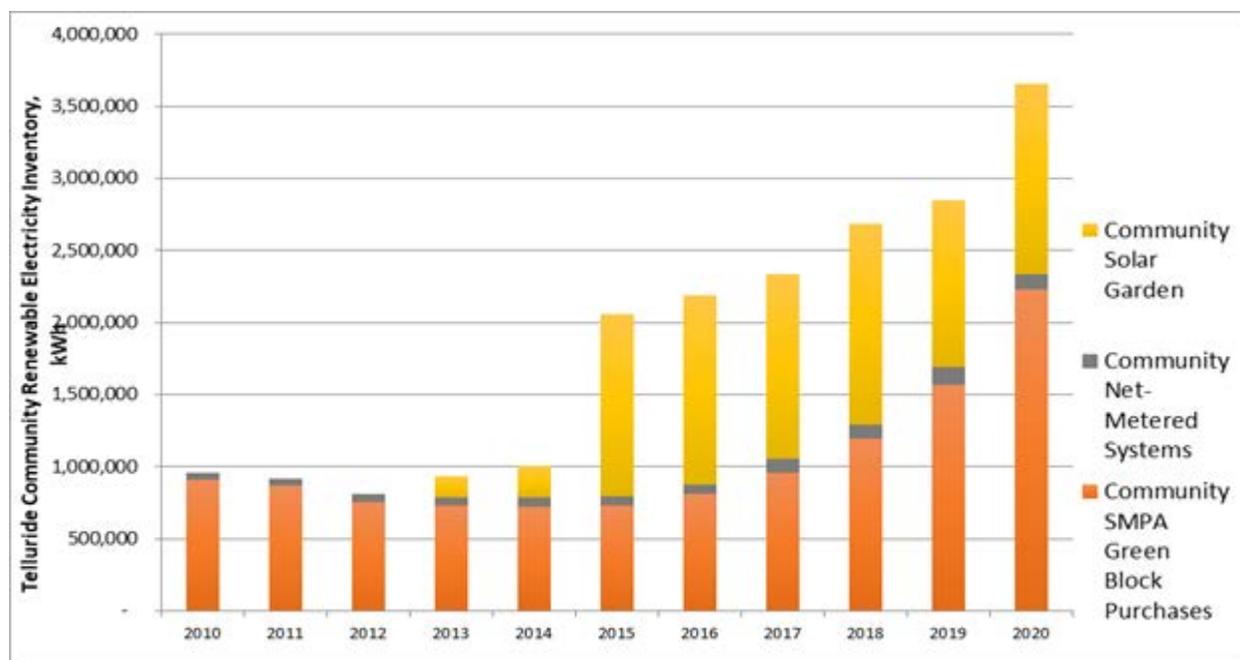
d This is an estimated value that includes the CEC solar panels purchased by the R-1 School District in 2015, and the 464 CEC solar panels purchase by the Telluride Government on behalf of owners and occupants of affordable housing throughout Telluride and in Shandoka in 2014. This is equivalent to a \$320,160.00 grant in late 2013.

## ENERGY EFFICIENCY

### Green Grants Program

The Town of Telluride began its Green Grant Project in 2019 and it took approximately 20 months to see all projects to completion, prior to starting the second cycle in fall 2020. Projects for the second cycle were completed during 2021 and their results will be reported as part of the 2021 GHG inventory report.

Table 4 presents all Green Grants projects to completed date. In 2019 and fall 2020, Green Grants of \$500 to \$35,000 were made available from a total of \$50,000 to qualified applicants. Funded by the Town of Telluride and administered by EcoAction Partners, Telluride Green Grants are available to discrete non-profit, commercial, and residential projects that deliver measurable greenhouse gas (GHG) reductions for the Town of Telluride community. Project ideas might include, but are not limited to, net-zero building construction, insulation & weatherization of existing buildings, replacement of old boilers and furnaces, renewable energy installations, waste reduction projects, water efficiency or conservation projects and transportation-related fuel reduction efforts.



**Figure 7. Telluride Community renewable electricity use 2010 – 2020, excluding the Ridgway Dam Hydro RECs purchased by the Telluride Government to offset electricity use by government operations and within the community.**

**Table 4. Projects Completed Through the Green Grants (GG) Program**

Company/Organization	Year Complete	Project Description	Annual Reduction	Unit of Measure	Life Span, years
Planet Bluegrass	2020	LED lighting and solar charging for Festivarians	1,018	kWh	10+
Viking Lodge HOA	2020	Window replacement and weatherization	15-20% improvement	Therms	20+
West Willow HOA	2020	Condominium insulation	473	Therms	20+
The Butcher & The Baker	2020	Bear-proof trailer for composting restaurant food waste	112	mTCO2	15+
San Miguel Resource Center	2020	SMRC Offices weatherization / energy efficiency projects	9.9	mTCO2	15+
Wilkin Court HOA	2020	Furnace replacements	19.3	mTCO2	20+
Telluride resident	2020	Window repair/replacement	50	Therms	20+
KOTO Radio	2020	Window replacement	15-20% improvement	Therms	20+
Beaver Pond HOA	2021	Replace insulation, siding, and windows		mTCO2	20+
Dirty Sturdy's Compost	2021	Expansion of local home and restaurant composting pickup business		Pounds of food	
The Blue House	2021	Replace 3 historic doors		Therms	20+
KOTO	2021	Window replacement		Therms	20+
Spruce House HOA	2021	Compost program pilot project		Pounds of food	
Viking Lodge	2021	Window replacement		Therms	20+
Wilkin Court HOA	2021	Furnace replacement for 10 units		Therms	20+

### Green Lights Program

EcoAction Partners' Greenlights Program is a partnership program between San Miguel Power Association and regional governments to assist residents and businesses with converting their lighting to LED bulbs. Through selected on-line LED vendors, the San Miguel Power Association (SMPA) rebate of up to fifty percent (50%) per LED bulb is rebated prior to the purchase (a pre-bate) for SMPA members. Each government's contribution goes directly towards off setting an additional twenty-five percent (25%) of the cost of the bulbs, for a total "pre-bate" of 75%, for its citizens and businesses to make the switch to LED lighting. Table 5 details the success of this program to date.

Note that 2020 Greenlights sales were significantly impacted by COVID, as EAP staff was unable to attend the Farmers' Market to sell bulbs to community members. A few businesses participated in the program as part of EAP's Green Business Program.

**Table 5. The Greenlights Program in Telluride**

<b>Year</b>	<b># LED Bulbs Purchased</b>	<b>Estimated kWh Saved</b>	<b>Reduced CO<sub>2e</sub> Generation, Metric Tons</b>
2016	438	23,000	20.1
2017	314	16,800	14.3
2018	311	17,100	13.8
2019	903	51,600	37.3
2020	86	2,188	1.69
<b>TOTAL</b>	<b>2,052</b>	<b>110,688</b>	<b>87</b>

### Green Business Certification Program

EcoAction Partners continued its Green Business Certification program through 2020. After a pause due to COVID, certification work resumed during the second half of the year. Through this program, EcoAction Partners helps businesses save money by guiding them to make targeted capital investments to decrease energy use of the space they occupy and their overall carbon footprint. The Telluride businesses that participated in the program in 2020 are listed below. The Town Government provides an incentive for businesses to renew their participation in the program by paying for the recertification fee.

Telluride's 2020 certified businesses that are based in or provide services to the Town of Telluride community, include the following:

1. Elevated Dental (year 1)
2. Alpine Bank (year 4)
3. La Cocina de Luz (year 7)
4. Jagged Edge Mountain Gear (year 7)
5. Mountainside Inn (year 1)
6. Ethos (formerly Picaya, year 7)
7. Patagonia (year 2)
8. San Miguel Resource Center (year 2)

More information about Green Building Certification in Telluride is provided at the following URL:  
<http://www.ecoactionpartners.org/certified-green-businesses/>

### Energy Audit Pilot Program

During the summer of 2016, the Town and Lotus Energy Solutions worked with two local realtors with homes in Telluride. The goal was to have them experience a Home Energy Audit, discuss the benefits and drawbacks of the process, agree to a meeting after a year to determine whether they implemented

the recommended actions to improve energy efficiency in their homes, and to pass on their experiences to other realtors. Ultimately, the goal is to have more existing housing go through a Home Energy Audit and to implement energy efficiency measures that make Telluride's existing housing stock more energy efficient over time. SMPA provided rebates for a portion of the cost of each audit. There has been no follow up to this program to date.

### **Plastic Film Upcycling Program**

EcoAction Partners (EAP) created this valuable recycling program off-shoot of its Green Business Program in response local businesses that requested a solution to dispose of plastic film in a responsible manner. EAP staff identified a solution through Trex®, a company that repurposes this material to create decking and furniture.

EAP provides a drop off location for the public in its shed behind the EAP office within the Town of Telluride. Collection also occurs at the following private businesses: Jagged Edge, Patagonia, Telluride Sports, Ghost Town and Bootdoctors/Paragon. These businesses typically drop off collected plastic at the EAP collection shed, though sometimes they directly transport large bulks of plastic to the Montrose collection site on their own. EAP relies on a community service volunteer and staff members to transport plastic to Montrose and continues to search for other community members who travel to/from Montrose regularly.

Since its inception through the end of 2020, this remarkable program has

- Upcycled well over 1,600 lbs. of plastic film since program inception, not including volume transported directly by businesses to the City Market collection location in Montrose without reporting weights to EAP staff.
- EAP directly collected 500+ lbs. of plastic film in 2020, despite a temporary pause in the spring due to COVID-19.

## **Part 4 – Government GHG Emissions & Mitigation Efforts**

The Town of Telluride government has been tracking and working to mitigate its GHG emissions since 2003. These emissions have been hovering around 4000 metric tons of carbon dioxide equivalents (CO<sub>2e</sub>) over time, while the level of service has increased considerably. In 2009, Town officials adopted by resolution the Colorado Climate Action Plan 2020 Goal of reducing GHG emissions 20% from 2005 levels by 2020 for the Town Government and the Telluride Community as a whole. In 2017, Town officials agreed to change the goal to becoming “carbon neutral”. No date was associated with this goal.

Town Government reached the goal of decreasing its GHG emissions 20% from 2005 levels by 2020 in 2012. It announced that it reached the goal of becoming carbon neutral in 2014 and has remained there ever since. However, in the future the Town will not likely be making this claim as it changes its GHG emissions accounting to be consistent with the updated globally accepted accounting methods in 2020.

Town Government has used a variety of methods to decrease its GHG emissions. These include:

1. Changing day-to-day operations, making efficiency improvements to facilities, and tracking energy usage each month to determine whether facilities are operating as expected.
2. Investing in local renewable electric generation in cooperation with the San Miguel Power Association and Tri-State Electric Generation and Electric Transmission Association, Inc.
  - a. Town Government owns and operates a 100kW solar array on its wastewater treatment facility, and a small hydropower generation facility at one of its water treatment plants.
  - b. Town Government owns a significant number of solar panels in the Community Solar Garden.

- c. Town Government purchases the renewable energy credits (RECs) that are available from hydropower generation at the Bridal Veil Powerhouse, which is at the headwaters of the San Miguel River at the east end of the Telluride Valley.
  - d. Town Government purchases the summer RECs that are available from hydropower generation at the Ridgway Dam, which is operated by Tri-County Water Conservancy District.
3. Preserving and caring for approximately 440 acres of parks and open space that provide opportunities for carbon sequestration.

## BASIS FOR GHG INVENTORY

### Base Year

Setting a base year is an important step for understanding progress in meeting GHG emissions goals. The base year is the benchmark against which future emissions are compared. The base year for the Telluride Government Facilities and Operations is 2005.

### Time Period

Like the Telluride Community GHG Inventory, the Telluride Government GHG Inventory covers a continuous period of 12 months aligning to the calendar year from January 1 through December 31.

### Boundary

GHG emissions for the Telluride government have been developed using the “bottom-up” quantification strategy. The “bottom up” approach is based on local data about activities in the government (e.g., emissions from natural gas use are derived from actual utility bills x the utility-specific natural gas emission factor). Bottom-up approaches are preferred for local government inventories.

Setting organizational boundaries is an important first step in creating a GHG inventory. It may seem straightforward to define which facilities and operations fall within the local government’s jurisdiction. However, according to global protocols, there are multiple ways to define jurisdictional boundaries. The two primary options for defining a jurisdiction are:

- Operational control: Under this approach, local governments account for the departments, activities, and operations over which they have “operational control,” or the authority to introduce and implement operating policies. This is the recommended approach in the LGOP and the most common way for local governments to set boundaries.
- Financial control: Under this approach, local governments account for the operations over which they have “financial control,” or the operations that are fully consolidated in financial accounts. This approach is consistent with international financial accounting standards.

This inventory, and all prior inventory documents, define jurisdictional boundaries that are under **operational control**. For example, while the Telluride Regional Wastewater Treatment Plant is a regional plant that is partly owned by the Town of Mountain Village, the Town of Telluride controls all operations of the facility and therefore claims all GHG emissions associated with this facility.

The LGOP recommends including several “required” emissions sources to ensure that GHG inventories are comprehensive and comparable between communities. The LGOP also suggests considering the quantification of “optional” sources for reductions to provide a more comprehensive image of the Telluride government’s environmental impacts and areas to target with sustainability projects. Those sources that are components of this 2020 GHG emissions summary are noted using a check mark.

### LGOP “Required” Emissions Sources

- ✓ Fuel combustion and electricity use in facilities (e.g., public buildings, wastewater treatment plants, water pumping stations)

- ✓ Electricity use for streetlights, traffic signals, and other public lighting
- ✓ Mobile fuel combustion in vehicle fleet and transit fleet
- ✓ Solid waste facilities

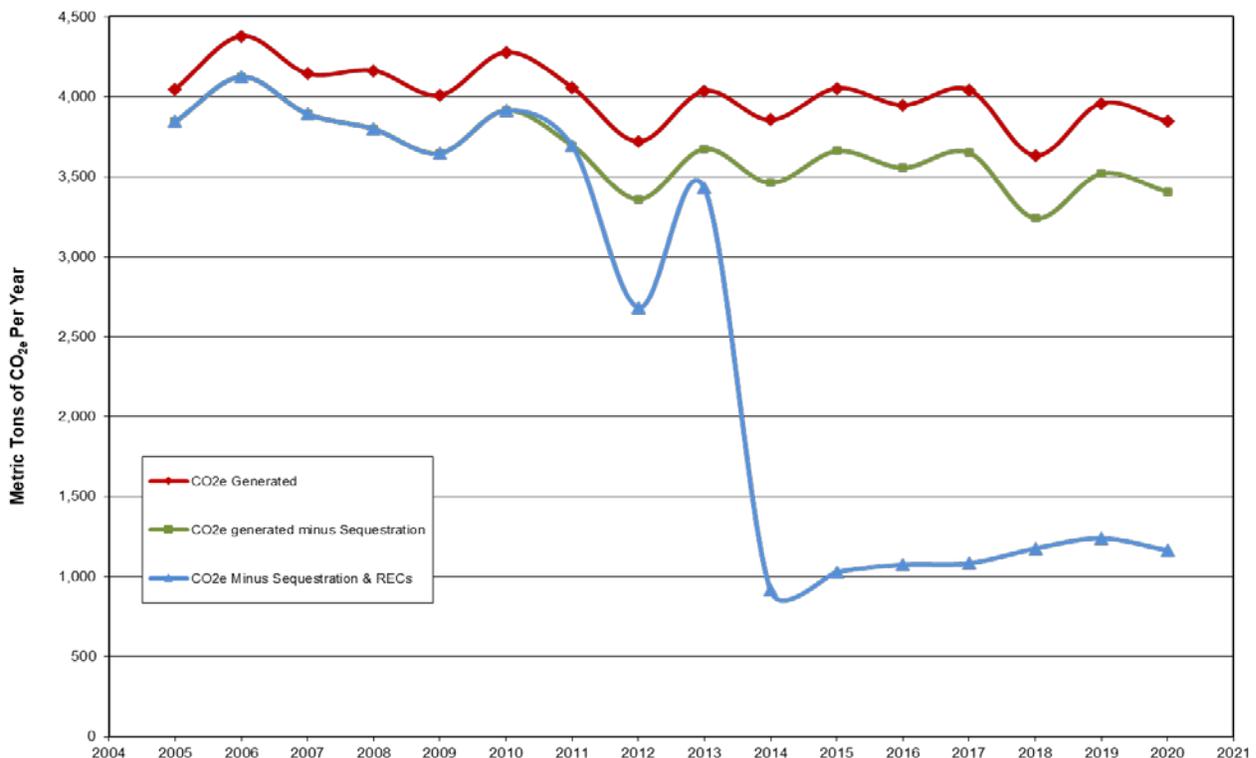
#### LGOP “Optional” Emissions Sources

- Purchased good and services
- Waste generation (Efforts will be made to include this in the 2022 GHG Emissions Inventory.)
- Electrical power distribution (Telluride does not generate power.)
- ✓ Employee commutes
- Employee business travel
- Fugitive refrigerants
- Other Scope 3 sources

### GOVERNMENT GHG EMISSIONS

**Telluride’s Government modified its GHG emissions accounting methodology to match global protocols and can no longer claim to be operating as a carbon neutral entity**

Figure 8 summarizes the GHGs generated and offset by Telluride Government facilities and operations from 2005 through 2020. GHG emissions from Telluride Government facilities and operations from 2005 through 2020 is shown by the red line. GHG emissions in 2020 were approximately 11% less than GHG emissions in 2005. Accounting for carbon sequestration by Town-owned open space lowers the Government’s GHG emissions approximately 17.6% below 2005 levels (green line). Adding benefits for the renewable energy credits from power generated at during the summer at Ridgway Dam (i.e., Tri-County Water), and Green Power Blocks purchased directly through SMPA, drops 2020 GHG emissions to 85% below 2005 emissions (blue line). The goal is to move the red line down to zero by 2040; therefore, there is a lot of work to do.



**Figure 8. The GHGs generated by Telluride Government facilities and operations from 2005 through 2020 (red), with carbon sequestration on Town-owned open space (green), and with REC purchases to offset electricity use (blue).**

In 2020, staff continued the GHG accounting system that it implemented in 2014. First, staff adjusts GHG calculations for 2019 using the latest Tri-State electricity multiplier, which is used to convert a kilowatt hour to pounds of CO<sub>2e</sub>. Sometimes, staff does not receive this information until approximately September of any given year after Tri-State officially releases its official value. Second, staff recognizes the Telluride Government's generation and use of local renewable electricity but does not use this as a credit in the accounting. This is because the Town Government does not own the renewable energy credits generated by these projects—San Miguel Power Association (SMPA) owns them—and therefore the Town Government cannot claim the environmental benefits (i.e., the GHG reductions).

Table 6 presents the multipliers used for each year for various energy sources. It is important to note that the gasoline and diesel multipliers reflect the total emissions generated from creating and using these fuels, which is inconsistent with the new “government accounting protocol.” Multipliers for the new protocol only account for the GHGs generated when the fuel is used.

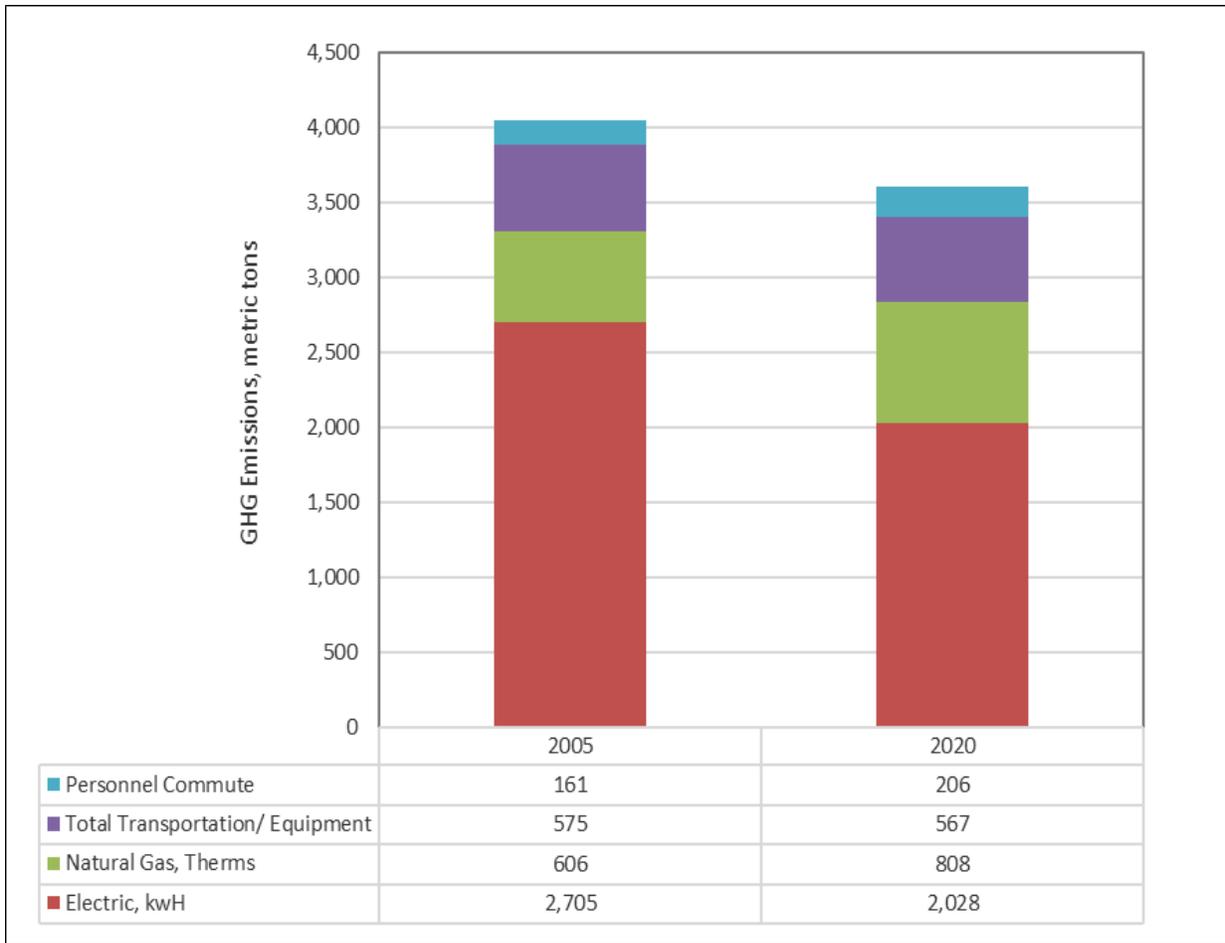
**Table 6. Multipliers Used for Various Energy Sources for Each Year of Accounting**

Year	Natural Gas, per therm	Electricity, per kWh	Diesel, per gallon	Unleaded Gasoline, per gallon	Biodiesel	Kerosene
2005-2009	12.05	2.20	27.81	26.22	17.9	19
2010-2011	12.05	2.12	27.81	26.22	na	na
2012	12.05	1.96	27.81	26.22	na	na
2013	11.88	1.93	27.81	26.22	na	na
2014	11.88	1.99	27.81	26.22	na	na
2015	11.68	1.87	27.81	26.22	na	na
2016	11.68	1.78	20.02	22.44	na	na
2017	11.68	1.746	20.02	22.44	na	na
2018	11.68	1.404*	20.02	22.44	na	na
2019	11.68	1.706	20.02	22.44	na	na
2020	11.68	1.570	20.02	22.44	na	na

\*This value is unusually low because the coal-fired plant at Craig, CO, was temporarily offline.

### **Government GHG Emissions by Energy Use Sector**

Figure 9 illustrates the GHG breakdown from absolute energy use by sector (i.e., electricity, natural gas, transportation/fleet, and personnel commute). The results of 2020 will likely be anomalous, as most government facilities were shut down or operating at much lower levels in 2020 due to the COVID-19 Pandemic. Nevertheless, electricity continues to be the largest type of energy consumed by Town operations and facilities. This has been true since 2005, which is why staff focus is on building energy use efficiency for lighting, appliances, water heaters, and weather proofing. Figure 9 illustrates the success of these efforts. However, at the same time, use of natural gas has increased, and fuel use for the personnel commutes has increased, essentially reducing much of the gain since 2005.



**Figure 9. Telluride government facilities & operations breakdown of CO<sub>2e</sub> generation for 2005 and 2020.**

**Carbon Sequestration by Town-Owned Green Space**

The Town quantifies carbon sequestration of town-owned open space, parks, and wild lands to include with other offsets such as RECs. This value is compared annually to overall GHG emissions as an accepted strategy of tracking the Town’s progress toward reaching GHG reduction goals. This approach recognizes the importance of Telluride’s commitment to park lands, open space, and wild lands as not just ecological and recreational amenities, but also as one component of the government’s strategy to meet its broader obligations to mitigate global warming.

Figure 9 illustrates the change in GHG emissions by Town Government facilities and operations when the carbon sequestered by Town-owned green space (e.g., parks, open space), if it were counted as a credit in the GHG emissions equation. Table 7 presents the methodology for calculating the amount of carbon sequestered by the ecosystems on the open space parcels. This table is updated when new acreage is added into the Town government’s Open Space Program. In 2020, no new acreage was added as Open Space. Future acreage estimates will adjust for improvements to Valley Floor habitat by restoration of the San Miguel River channel and increased wetland acreage created by beaver activity. As well, the CO<sub>2e</sub>.sequestration values for each ecotype will be updated with more recent scientific values.

**Table 7. Estimation of Carbon Sequestration by Open Space / Undeveloped Lands Owned and Managed by the Town of Telluride**

Town-owned Open Space	Type	Acreeage	CO2e Sequestered (metric tons/ac/yr)	CO2e Sequestered (metric tons/yr)	
Pearl Property	meadow	3	0.2	0.6	1.8
	grass wetland	6	0.2	1.2	
Bear Creek Preserve	forest	419	0.6	242.9	
Bear Creek Other	shrubland/meadow	100	0.2	20.1	
River Park	riparian	5	0.1	0.5	
In-town park lands	meadow/grass	25	0.2	5.0	
Cornet Gorge Wedge	forest	36.4	0.5	18.2	
Valley Floor	forest	56	0.5	28.0	127.8
	wetland	283	0.2	56.6	
	riparian	22	0.1	2.2	
	shrubland/meadow	205	0.2	41.0	
Boomerang Lode	forest	10.3	0.5	5.2	
Wolverine Lode	forest	5.7	0.5	2.9	
North and East	shrubland/meadow	4.2	0.2	0.8	
Beaver Park	shrubland/meadow	40.0	0.2	8.0	
Mill Creek Road	forest	9.0	0.5	4.5	
La Junta Basin	high alpine meadow	6.0	0.2	1.2	
Windhorse	shrubland/meadow	3.8	0.2	0.8	
<b>TOTAL</b>	<b>mixed</b>	<b>1,239.6</b>	<b>0.3</b>	<b>439.6</b>	

References:

- U.S. Environmental Protection Agency, Carbon Sequestration in Agriculture and Forestry ([http://www.epa.gov/sequestration/local\\_scale.html](http://www.epa.gov/sequestration/local_scale.html), 9/6/2006 3:58 pm)
- U.S. Geological Survey, International Program. Carbon Sequestration (<http://www.edcintl.cr.usgs.gov/carboneoverview.html>, 9/6/2006 3:15 pm)
- U.S. Department of Energy, Terrestrial Sequestration Research (<http://www.fossil.energy.gov/sequestration/terrestrial/index.html>, 3:03 pm)
- Open Space Program Inventory, Provided by Lance McDonald, 2019

## RENEWABLE ENERGY

### Renewable Electricity Generation and GHG Mitigation Projects by Telluride Town Government

Table 8 presents all Telluride Government renewable energy generation and GHG mitigation projects since 2005. Figure 8 shows the Telluride Government’s current GHG emissions picture eliminating all renewable energy projects that the Telluride Government has participated in, but for which it does not own the renewable energy credits. These projects include solar panels purchased for town-owned facilities at the Clean Energy Collective’s Paradox Solar Array (e.g., Public Works & Transit Facility, the Marshals Building, and Shandoka Affordable Rental Housing), and the solar panels located on the Telluride Regional Wastewater Treatment Plant (WWTP). Figure 8 for 2020, also shows credit for RECs purchased from the Ridgway Dam Project. The remainder of these 2020 credits were intended to offset the Telluride Community’s emissions generated by its usage of electricity, see Part 3 of this report.

**Table 8. List of all Town Government Renewable Electricity Generation and GHG Mitigation Projects**

#	Project	Year On Line	Cost	Potential kWh renewables generated per year <sup>a</sup>	Potential GHG Reduction (metric tons CO <sub>2e</sub> /yr) <sup>a,b</sup>	Renewable Energy Credits Ownership
1	Carhenge Bus Stop Solar Panel	2005	\$5,500			Telluride
2	Telluride Regional WWTP Solar Array	2010	\$305,945 <sup>b</sup>	172,000	151	SMPA
3	CEC Solar Panels to Offset Public Works & Transit Facility and Marshals Building Electric Use	2012	\$187,074	85,660	75	SMPA
4	CEC Solar Panels to Offset Shandoka House Meters and the Pre-School	2014		90,338	90	SMPA
5	Pandora Hydro Facility	2015	\$600,000	1,530,000	1,339	SMPA
6	Telluride Regional WWTP Green Blocks Purchase	2012	\$996 annually	99,600	87	Telluride
7	Bridal Veil Hydro Facility REC Purchase	2011	\$3,951 annually	395,100	346	Telluride
8	Ridgway Dam Hydro Facility REC Purchase <sup>d</sup>	2014	\$16,600 avg annual	13,000,000	11,381	Telluride
TOTAL				15,372,698	13,469	

<sup>a</sup> Each year the actual value will change based on electrical generation.

<sup>b</sup> GHG reduction is calculated using the Tri-State conversion value of 1.93

<sup>c</sup> The total cost was \$620,685; however, this includes \$150,000 contributed through a Governor’s Energy Office Grant and \$164,740 contributed as 35% cost share by Mountain Village.

<sup>d</sup> The cost is for the full amount of RECs, which is for 13,000,000 kWh per year. However, the Town Government has elected to grant a majority of these RECs to the community at large while using enough to offset to carbon neutrality for its own facilities and operations.

### **Renewable Energy Credits Purchases for Locally Generated Power**

#### **Bridal Veil Powerhouse – Idarado**

Table 9 shows the kilowatt-hours purchased, renewable energy credits, and cost for one half of the power generated at the Bridal Veil Powerhouse from 2012 through 2016. The Bridal Veil Powerhouse has not generated power since August 2016, because it is undergoing repairs and renovations that will improve on its reliability into the future. It is expected to be generating power once again in 2022.

#### **Ridgway Reservoir Power Station – Tri-County**

2020 was the seventh year that the Telluride Government purchased renewable energy credits from the summertime power generated by Ridgway Reservoir Power Station—a hydroelectric system. The purchase agreement was extended in May 2017 to continue indefinitely. Table 10 shows the kilowatt-hours purchased, renewable energy credits, and cost for 2014 through 2020 for this local renewable energy credit program. The Town assigns only enough of these renewable energy credits to Town Government to offset its electricity use. Each year this varies. The remaining renewable energy credits are assigned to the Telluride Community. While in 2018, due to severe regional drought (D4 rating), the Ridgway Reservoir Project generated far less power than in previous years, power generation was up again in 2019 and 2020.

**Table 9. Price, Kilowatt-hours, and Renewable Energy Credits from the Bridal Veil Powerhouse Purchase Agreement**

Year	kWh	Credits, Metric Tons CO <sub>2e</sub>	Cost
2012	395,100	351	\$ 3,951.00
2013	144,090	126	\$ 1,440.90
2014	40,410	36	\$ 404.10
2015	652,410	553	\$ 6,524.10
2016	190,440	154	\$ 1,904.40
2017	0	0	\$ -
2018	0	0	\$ -
2019	0	0	\$ -
2020	0	0	\$ -
TOTAL	1,422,450	1,221	\$ 14,224.50

**Table 10. Price, Kilowatt-hours, and Renewable Energy Credits from the Ridgway Reservoir Power Station Purchase Agreement**

Year	kWh	Credits, Metric Tons CO <sub>2e</sub>	Cost
2014	11,641,000	10,508	\$ 14,550.00
2015	15,879,000	13,469	\$ 19,845.76
2016	14,684,700	11,856	\$ 18,355.88
2017	16,730,300	14,191	\$ 20,912.89
2018	5,655,900	4,377	\$ 7,069.88
2019	18,363,800	14,211	\$ 22,954.76
2020	8,756,860	6,776	\$ 12,006.34
TOTAL	91,711,560	75,388	\$ 115,695.51

### ***Pandora Hydroelectric Facility Power Production***

The Pandora Hydroelectric Facility officially began producing power for purchase in 2015 through a Power Purchase Agreement with San Miguel Power Association. Table 11 provides information on the production of electricity and revenue associated with the purchase of that power through 2020. The current estimated payback for investment in this equipment is likely to be 10 more years.

### ***Telluride Regional Wastewater Treatment Plant Solar Array Power Production***

The TRWWTP solar array has been operating for 10 years. Table 12 details the solar array production from 2010 through 2020. To date, this generated power has saved the Town of Telluride approximately \$127,600 in electric costs and approximately \$35,000 in demand charges (calculated based on a comparison with 2010 demand charges). The Solar Array cost approximately \$621,000 dollars total: \$150,000 came from a GEO grant; the remaining funds were provided by Telluride and Mountain Village. The estimated payback for the investment in this equipment is approximately 24 years.

**Table 11. Annual Kilowatt-hours and payback generated by the Pandora Hydroelectric Facility**

Year	kWh	Reduced CO <sub>2e</sub> Generation, Metric Tons	Revenue
2015	599,918	509	\$ 51,235.00
2016	551,920	446	\$ 28,293.42
2017	220,392	175	\$ 1,689.08
2018	564,552	437	\$ 26,084.49
2019	983,680	761	\$ 66,284.40
2020	379,440	294	\$ 24,735.51
TOTAL	3,299,902	2,621	\$ 198,321.90

**Table 12. Telluride Regional Wastewater Treatment Plant Solar Array Production**

Year	Time of Operations	Total Energy Produced (kWh)	Credits, Metric Tons CO <sub>2e</sub>	Approx. Energy Dollars Saved, \$
2011	Feb 28 – December 31	155,948	150	\$ 9,146
2012	January 1 – December 31	182,609	162	\$ 13,845
2013	January 1 – December 31	175,459	154	\$ 14,005
2014	January 1 – December 31	171,685	155	\$ 13,765
2015	January 1 – December 31	172,289	146	\$ 13,783
2016	January 1 – August 24	107,927	92	\$ 8,643
2017	February 15 – December 31	166,321	141	\$ 13,285
2018	January 1 – December 31	186,347	158	\$ 14,885
2019	January 1 – December 31	164,000	139	\$ 13,120
2020	January 1 – December 31	164,000	139	\$ 13,120
Total through 2020		1,646,585	1,436	\$ 127,597
Averages		164,659	144	\$ 12,760

\*A ground short that stopped power production in August 24, 2016, at 3:30 pm was not discovered until end of year data retrieval in January. A contractor was hired to locate and repair the problem. Electricity was once again being generated in February 2017.

### ***Carhenge Bus Stop & Restrooms Solar “Array”***

Since its construction in 2005, electricity for the Carhenge bus stop and restrooms has been provided entirely by single solar panel located behind the building. The Town has never calculated the energy savings this provides because it has never contributed to the government facilities’ carbon footprint. It is an example of how everyday construction and operations decisions by staff has helped to move closer to the goal of operating as a carbon neutral entity.

### ***Solar Panels at the TRWWTP & Gondola River Gages***

The electricity provided to the Town’s flow recorder on the San Miguel River upstream from the Telluride Regional Wastewater Treatment Plant discharge and a second gage at the Gondola were, until October 2021, powered by small solar panels. The Town never calculated the energy savings these provided—it was likely quite small—but these important facilities never contributed to the town government’s carbon footprint through energy use. The current gages are powered by battery.

## ENERGY EFFICIENCY

Appendix A provides generalized graphs of electricity and natural gas use for government facilities and operations, as well as transportation fuel use and commuting fuel use for employees. Government operations and use of facilities were curtailed for much of 2020 in response to the COVID-19 pandemic. As a result, much of the 2020 GHG inventory is anomalous.

Town Government actual electric use in 2020 was greater than in 2005 by 17%. This includes the benefits of the solar panels on the wastewater treatment plant. Because a greater proportion of the Tri-State electricity mix is coming from renewables, the GHG emissions from this electric use remained below 2005 GHG emissions by 16%.

Town Government, natural gas use in 2020 was greater than in 2005 by 38% and GHG emissions were greater than in 2005 by 33%.

Use of fuels for transportation and various equipment in 2020 was less than in 2005 by 1%. This includes fuel use by the Town Government fleet. GHG emissions created by this energy use was also less than in 2005 by 1%.

A 53% decrease of fuel use and GHG emissions by transit resulted from decreased service levels, because San Miguel Area Regional Transit (SMART) took over all routes outside of the town proper, and because local service was curtailed in response to the COVID-19 pandemic.

GHGs generated by fuel use by personnel commutes for work in 2020 continued to climb and were greater than 2005 levels by nearly 26%.

As electricity use remains significantly larger, the GHGs produced by Town facility electric usage has dropped from 3 times greater than the CO<sub>2e</sub> produced by Town facility natural gas usage to 2.8 times greater. In 2020, Town Government facility electric use generated approximately 4 times more CO<sub>2e</sub> than Town Government transportation fuels use. While staff continues to recommend focusing energy use improvements on electric use in Town Facilities, the upward trends of use of transportation fuels and natural gas will have to be examined more closely and addressed, if possible, within the next several years.

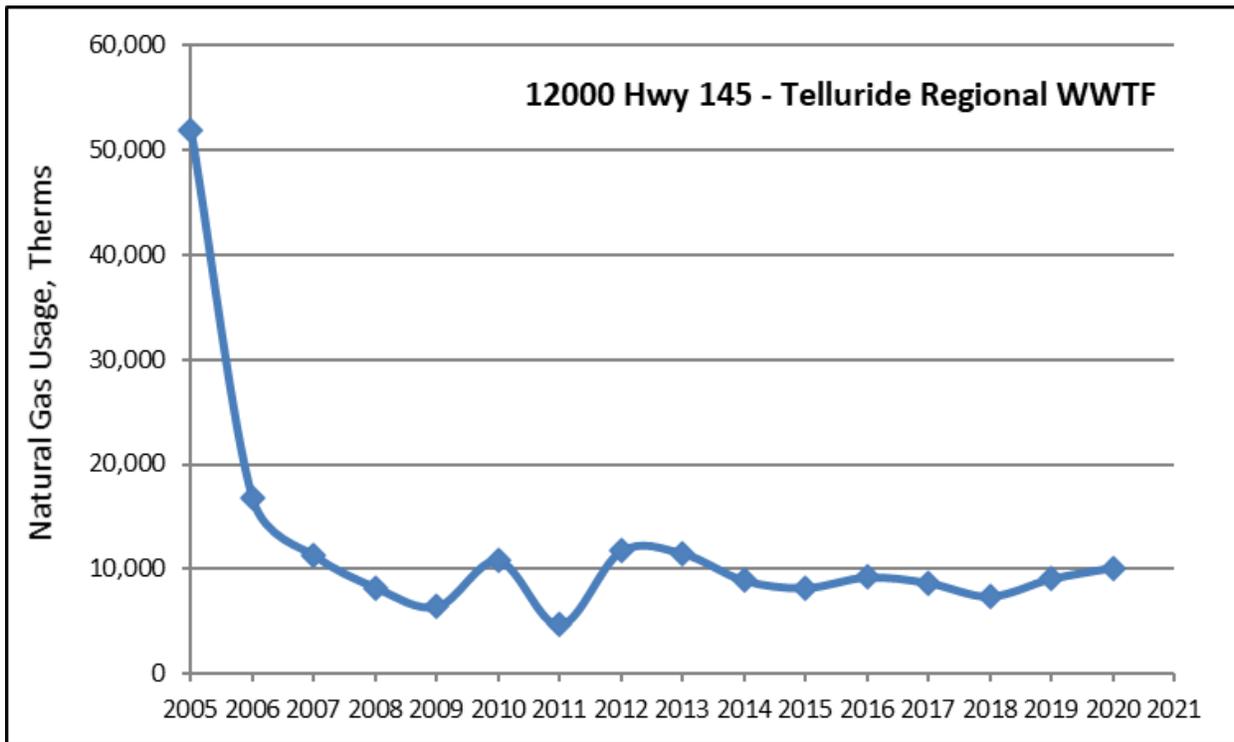
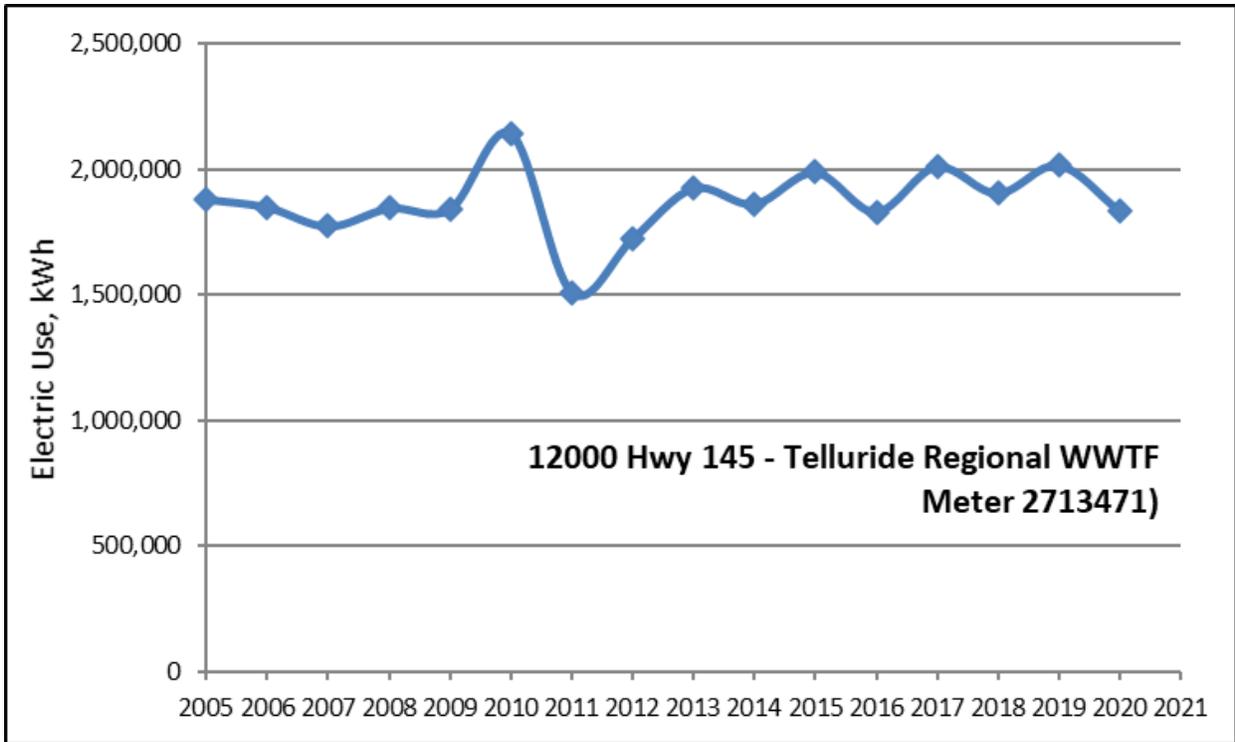
To help staff keep an eye on the energy use in facilities that they use and/or occupy, each quarter the Energy Action Coordinator provides graphics of energy use at each facility to Department Heads. Department Heads are expected to provide this information to their staff, discuss the results, and brainstorm ways to improve results.

Figures 10, 11, and 12 show the Town facilities with the highest energy use over time to date: Telluride Regional Wastewater Treatment Plant, Hanley Pavilion, and the Public Works & Transit Facility. Each facility is being used much more intensively in 2020 than in 2005.

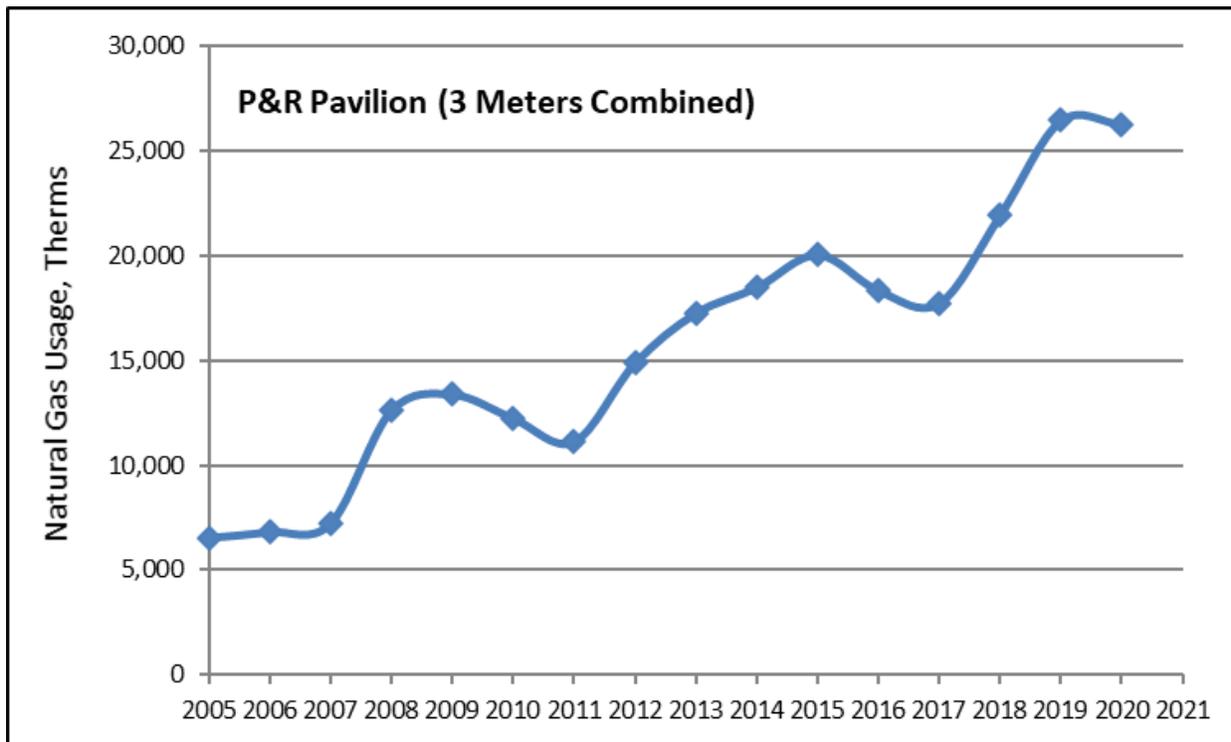
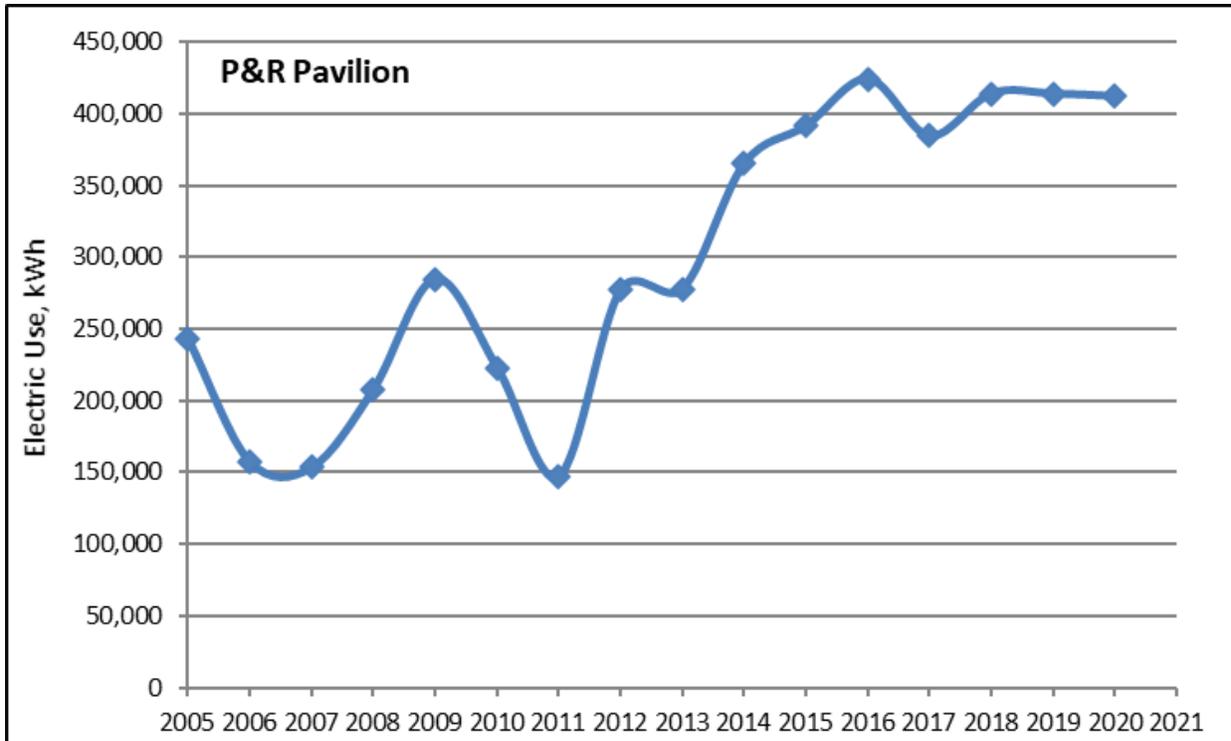
Figure 10 shows long term electric and natural gas use at the Telluride Regional Wastewater Treatment Plant. The figure shows the positive result of efforts to make that facility more efficient with electricity use over time.

Figure 11 shows energy use at the Hanley Pavilion, which reflects increasingly intensive use and also shows the Parks & Recreation staff are managing building energy use more closely. The addition of the Zamboni Room and the HVAC system clearly increased natural gas use by approximately 300% over 2005 usage levels. Expansion of the facility 3,300 square feet in 2020 has not increased energy use.

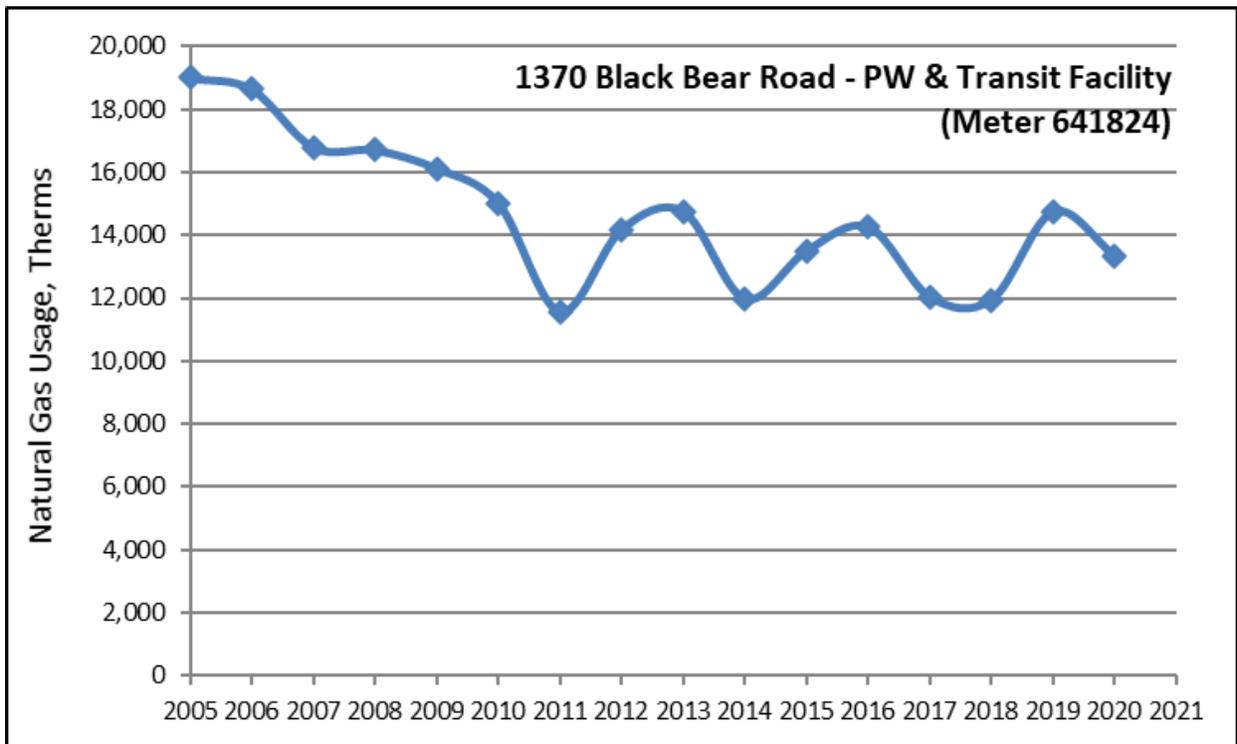
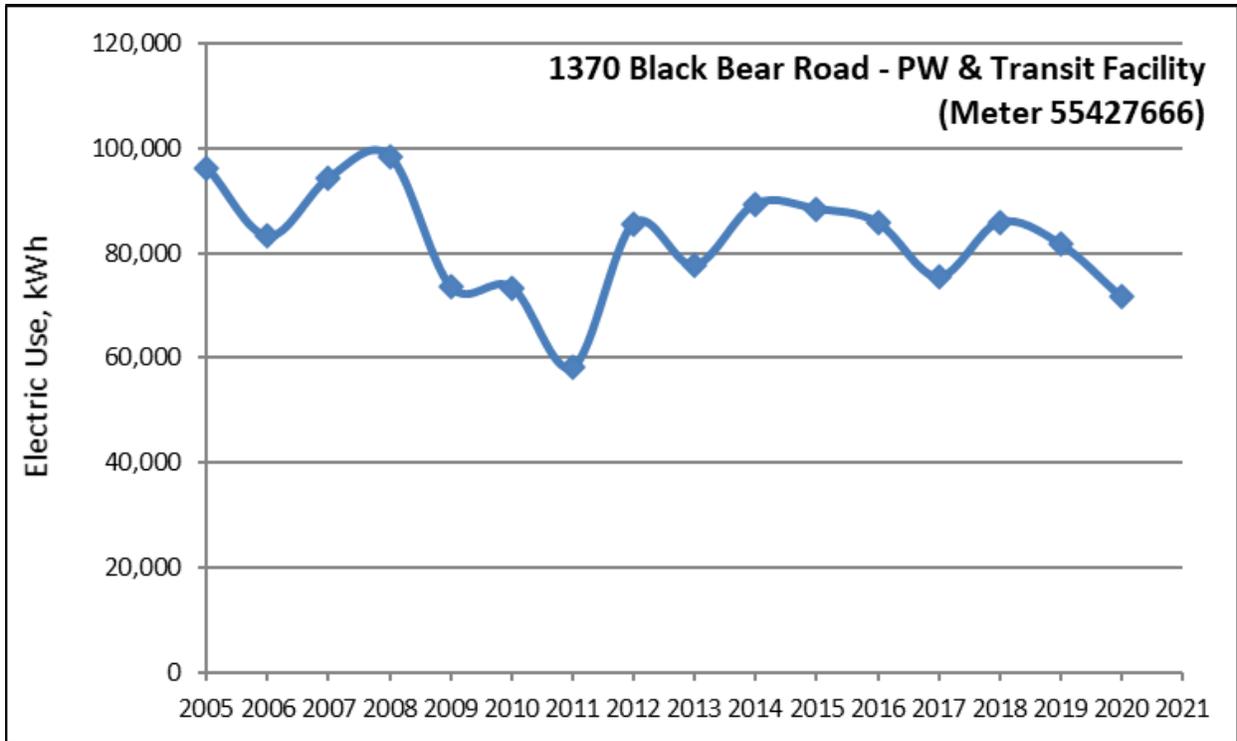
Figure 12 shows energy use at the Public Works and Transit Facility. The Public Works and Transit Facility has decreased electric use over time, and the physical modifications to this facility that expanded interior garage and office space resulted in no significant energy use changes. It is important to note that the electricity used by this facility "comes from" the Paradox Community Solar Array.



**Figure 10. Annual average electric usage (top) and natural gas usage (bottom) for the Telluride Regional Wastewater Treatment Plant from 2005 through 2020**



**Figure 11. Annual average electric usage (top) and natural gas usage (bottom) for the Town Park Pavilion from 2005 through 2020**



**Figure 12. Annual average electric usage (top) and natural gas usage (bottom) for the Public Works & Transit Facility from 2005 through 2020**

## Part 5 – Recommendations

### TO DECREASE GHGs GENERATED BY THE COMMUNITY

#### Status of Recommended 2020 Actions

1. Work with EcoAction Partners  
(complete)
  - ✓ Expand the Green Business Certification Program in Telluride
  - ✓ Manage and promote the Green Lights Program in Telluride
  - ✓ Assist with launch of 2021 Green Grants Program for Telluride residents and businesses
  - ✓ Quantify Telluride-specific community GHG emissions
2. Continue to work with SMPA to track renewable energy generation, and green block and solar energy offsets by those living within the Town of Telluride.  
( ✓ complete)
3. Build additional affordable housing within the Town-limits and develop a methodology to calculate the estimated GHG emissions reductions. However, a methodology to calculate the estimated GHG emissions reductions has not yet been established.  
(mostly complete)

#### Recommended 2021 & 2022 Actions

1. Update Telluride's Climate Action Plan
2. Work with EcoAction Partners
  - Expand Green Business Program in Telluride by converting to a membership program with a one-time certification option.
  - Manage and promote the Green Lights Program in Telluride. Transition in 2022 to a business-only program in association with Green Business, and without the current 25% government rebate subsidy.
  - Assist with launch, administration and project monitoring of 2021 and 2022 Green Grants Program for Telluride residents and businesses
  - Inventory Telluride-specific community GHG emissions. Update calculation and tracking methodology to ICLEI's online ClearPath program for greater staff accessibility, forecasting tools, and other ICLEI membership benefits.
3. Continue to work with SMPA to track renewable energy generation, and green block participation by those living within the Town of Telluride.
4. Build additional affordable housing within the Town-limits and develop a methodology to calculate the estimated GHG emissions reductions. (Sunnyside Affordable Housing Project)

### TO DECREASE GHGs GENERATED BY GOVERNMENT OPERATIONS & FACILITIES

#### Status of Recommended 2020 Actions

Item IV.A of Town Council's 2020 Goals & Objectives listed the following objectives to reduce the town government's carbon footprint. In the 2019 Energy Audit, Staff recommended specific actions for each. The status of each recommended action is summarized.

1. Work with Local Resources re Environmental Data, Outreach and Education. ( ✓ complete)

*EcoAction Partners analyzes energy use by the broader Telluride Community, and the region, to help staff understand where the Town Government stands when compared to the whole. In*

2020, despite challenges posed by the COVID-19 Pandemic, EcoAction Partners continued to spearhead Telluride's Green Lights Program and continued to implement the Green Business Certification Program.

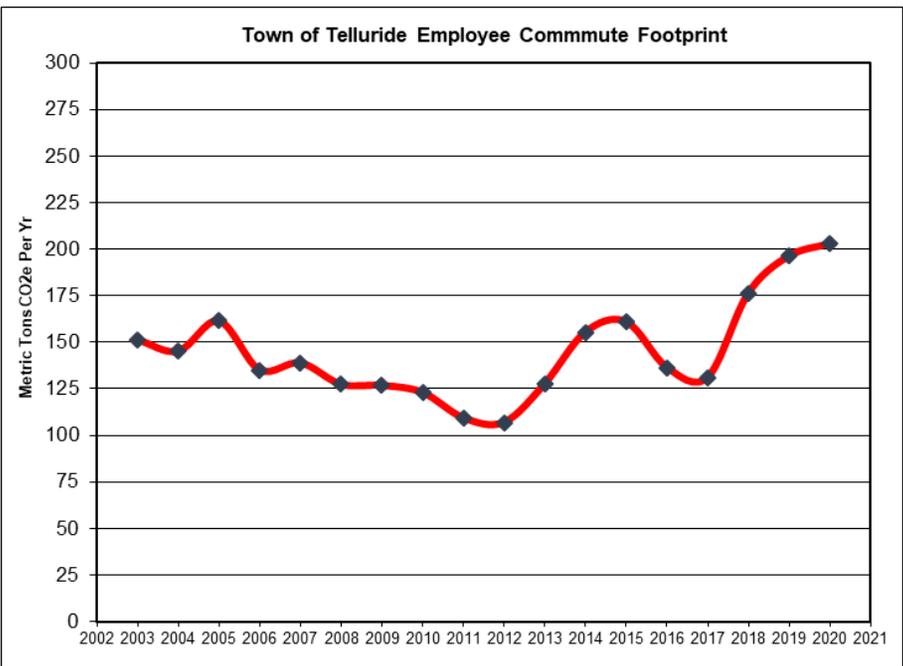
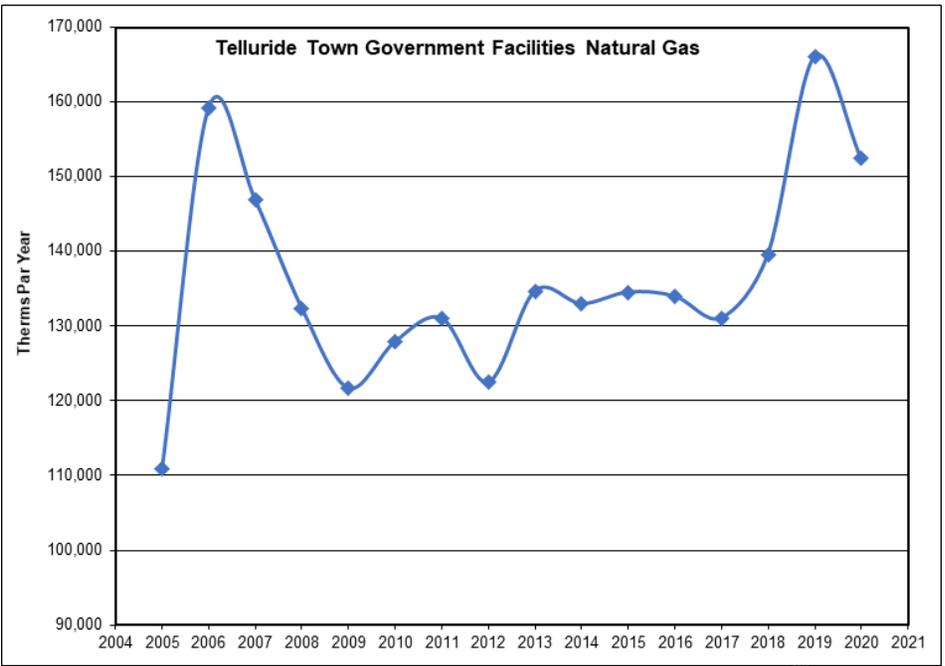
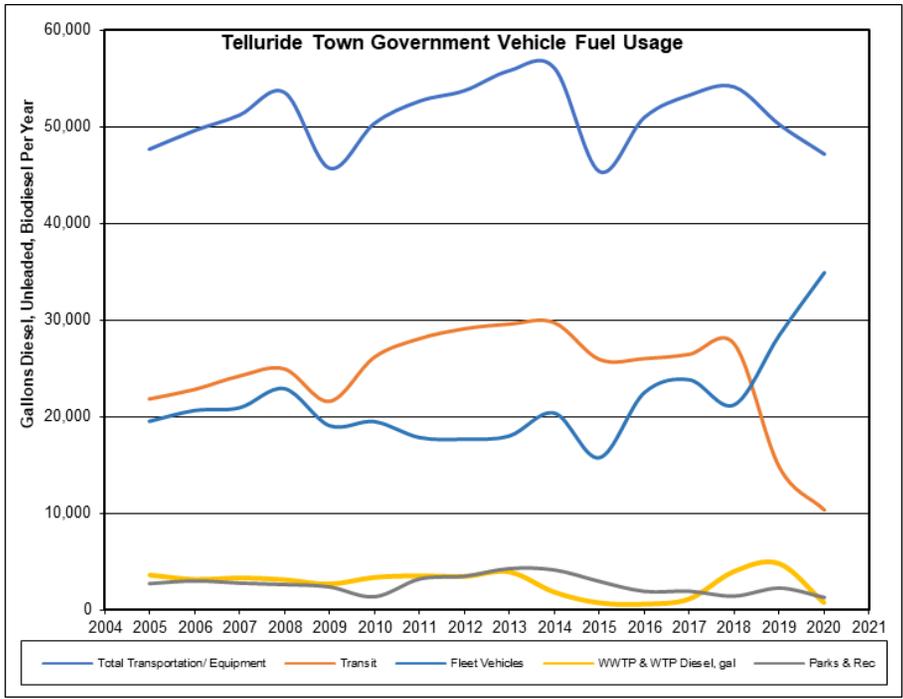
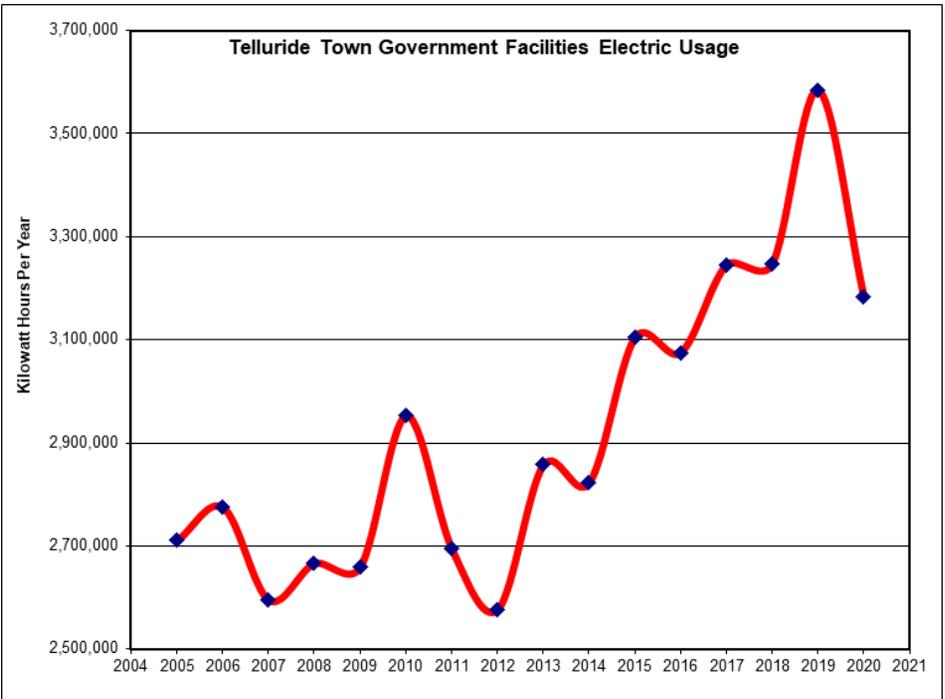
2. Engage in Advocacy for Climate Action at Local, State, and Federal Levels.
  - o CC4CA (✓ complete)
  - o Compact of Colorado Communities (✓ complete)
  - o CML (✓ complete)
  - o Sneffels Energy Board (✓ complete)
  - o The Carbon Neutral Coalition (✓ complete. This organization dissolved in 2020.)
3. Continue to Pursue Renewable Energy Options. (✓ complete)
  - o Continue to explore opportunities to invest in or support local micro-hydroelectric generation.
  - o Continue to explore opportunities to invest in or support solar electric generation in town and the region. The solar array by the airport was brought online in 2020. While the electric generation is not currently being sold, it is being donated to local nonprofits.
4. Improve energy efficiency in Town facilities and Activities. (✓ complete)
  - o Moved forward on the Lighting Efficiency Program for Town facilities
  - o Implemented the LED lighting prototype along West Pacific Avenue. Track energy use. Plan for 2020 Street Lighting Replacement.

### **Recommended 2021 & 2022 Actions**

The following continue to be objectives to reduce the town government's carbon footprint.

1. Work with Local Resources re Environmental Data, Outreach and Education.
2. Engage in Advocacy for Climate Action at Local, State, and Federal Levels.
  - o CC4CA
  - o Compact of Colorado Communities
  - o CML
  - o Sneffels Energy Board
3. Continue to Pursue Renewable Energy Options.
  - o Continue to explore opportunities to invest in or support local micro-hydroelectric generation.
  - o Continue to explore opportunities to invest in or support solar electric generation in town and the region.
4. Improve energy efficiency in Town facilities and Activities.
  - o Move forward on the Lighting Efficiency Program for Town facilities
  - o Install another 10 LED new-style commercial lights in the Town core. Track energy use. Plan for 2021 & 2022 Street Light Replacement.

# **APPENDIX A - Long-term Energy Use Trends for Telluride Government Facilities & Operations**



# Telluride Town Government Carbon Tracking

Fuel Breakdown	2005			2020			% Change CO <sub>2e</sub> from 2005
	Usage	CO <sub>2e</sub> lb/yr	CO <sub>2e</sub> MT/yr	Usage	CO <sub>2e</sub> lb/yr	CO <sub>2e</sub> MT/yr	
<b>Facilities</b>							
Electric, kWh	2,710,674	5,963,483	2,705.0	3,184,454	4,470,973	2,028.0	-25.0%
Natural Gas, Therms	110,824	1,335,429	605.7	152,437	1,780,464	807.6	33.3%
		<b>7,298,912</b>	<b>3,310.8</b>		<b>6,251,438</b>	<b>2,835.6</b>	-14.4%
<b>Transportation/Vehicles/Equipment</b>							
<b>Transit</b>							
Gas-Unleaded, gal	11,952	313,376	142.1	10,300	270,097	122.5	
Diesel, gal	8,638	240,209	109.0	34	951	0.4	
Biodiesel, gal	1,256	22,477	10.2	0	0	0.0	
Transit Total	21,845	576,062	261.3	10,334	271,048	122.9	-52.9%
<b>Fleet Vehicles</b>							
Gas-Unleaded, gal	10,582	277,468	125.9	24,442	640,967	290.7	
Diesel, gal	8,956	249,058	113.0	10,408	289,426	131.3	
Fleet Total	19,538	526,526	238.8	34,850	930,393	422.0	76.7%
WWTP & WTP Diesel, gal	3,562	93,396	42.4	698	15,663	7.1	-83.2%
<b>Parks &amp; Rec</b>							
Gas-Unleaded, gal	2,344	61,470	27.9	0	0	0.0	
Diesel, gal	356	9,906	4.5	0	0	0.0	
Additional Diesel, gal				250	6,952	3.2	
Additional Unleaded, gal				1,004	26,329	11.9	
Kerosene				0	0	0.0	
Parks & Rec Total	2,701	71,376	32.4	1,254	33,281	15.1	-53.4%
<b>Total Transportation/ Equipment</b>	<b>47,646</b>	<b>1,267,360</b>	<b>574.9</b>	<b>47,136</b>	<b>1,250,384</b>	<b>567.2</b>	<b>-1.3%</b>
Personnel Commute		355,797	161.4		447,563	203.0	25.8%
<b>CO<sub>2e</sub> Generated</b>		<b>8,922,068</b>	<b>4,047.0</b>		<b>7,949,385</b>	<b>3,605.8</b>	<b>-10.9%</b>
Open Space CO <sub>2e</sub> sequestered		447,317	202.9		969,093	439.6	
CO <sub>2e</sub> generated minus Sequestration		<b>8,474,751</b>	<b>3,844.1</b>		<b>6,980,292</b>	<b>3,166.2</b>	<b>-17.6%</b>
Bridal Veil RECS				0	0	0.0	
Ridgway Dam RECS				3,084,849	5,262,753	2,387.2	
Pinhead Goose RECS					-271,048	-122.9	
WWTP GreenPower Purchase				99,600	-186,252	-84.5	
WWTP PV Electric Generation				0	0	0.0	
CEC Solar Panels				0	0	0.0	
<b>CO<sub>2e</sub> Minus Sequestration &amp; RECS</b>		<b>8,474,751</b>	<b>3,844.1</b>		<b>1,260,239</b>	<b>572</b>	<b>-85.1%</b>

# APPENDIX B - Specific Actions to Decrease Energy Use in Town Government Facilities & Operations

## 2020 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use

- 10 streetlights along West Pacific Avenue were changed to LED in summer 2020.
- Update pumps at Mill Creek Water Treatment Plant to a higher efficiency.
- Update structure at Mill Creek Water Treatment Plant to improve insulation.
- Insulated the Public Works & Transit Facility Bus Barn ceiling.

## 2019 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use

- 10 streetlights along West Pacific Avenue were changed to LED in summer 2019.
- **New For-purchase Affordable Housing Projects (Longwill 19, Silverjack)** built to be energy efficient and sustainable and providing qualified locals with in-town housing.
- Eliminated the sewage lift station at the Public Works Facility (November 2019).

## 2018 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use

- 10 streetlights along West Pacific Avenue were changed to LED in summer 2018.
- September/October Elks Building Restroom remodel replaced heating system with more efficient system and replaced an exhaust unit with an air recirculation unit to the back.
- Used Precision Concrete Cutting to grind down trip hazards on sidewalks throughout Town.
- **New For-rent Affordable Housing Projects (Virginia Placer, Boarding House, 3 tiny homes)** built to be energy efficient and sustainable and providing 88 qualified locals with in-town housing.

## 2017 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use

- 9 streetlights along Butcher Creek Drive were changed to LED in summer 2017.
- Used Precision Concrete Cutting to grind down trip hazards on sidewalks throughout Town, rather than ripping up older concrete and replacing it, saving on equipment costs and concrete costs.
- Replaced numerous lighting throughout town-owned facilities with LEDs.
- EcoAction Partners calculated that good construction practices for the Town Park Backstop Replacement Project resulted in 32.9 metric tons of GHG emissions reductions.
- **Special Note on Affordable Housing Projects (Spruce House) –**  
While affordable housing units are built by the Town, they are not town-owned facilities once they are sold. Nevertheless, it is important to document the efforts to make housing in Telluride, in general, more energy efficient and sustainable. The following was provided by Lance McDonald, Program Manager, as a summary:
  - *The Project was designed to meet the “Town of Telluride Energy Efficient and Environmentally Responsible Building Code.” Following is a listing of “green” or sustainable products and practices incorporated into the Project.*
  - *Energy Efficiency: building product installation techniques for a properly sealed envelope; high efficiency natural gas boiler systems (95% efficient) with in-floor and baseboard radiant heat; Energy Star rated appliances and lighting fixtures (~90%); mostly compact fluorescent light fixtures; insulation of hot water pipes at specified locations, R-50 roofs, R-24 wall.*
  - *Materials: recycled-content or certified wood deck material; aluminum-clad wood, low-E glazed windows; fiber cement siding; natural linoleum, tile, concrete, or wood in lieu of vinyl for flooring; and recycled-content carpet with recycled-content carpet pads.*
  - *Indoor Air Quality: formaldehyde-free insulation; low-toxic, solvent-free adhesives; and low VOC paints and stains.*
  - *Resource Conservation: construction recycling area and practices; energy saving water fixtures/fittings.*

## 2016 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use

- Used Precision Concrete Cutting to grind down trip hazards on sidewalks throughout Town.
- LED lighting exchange program. Over time, the Facilities Management Division is working to decrease electric usage by changing to LED lighting as old bulbs and fixtures wear out. In 2016, 48 light bulbs and/or fixtures were changed to LEDs.
- Shandoka Parking Lot lighting change to LED was completed in spring 2016.
- EcoAction Partners calculated that good construction practices for the Town Park Tennis Courts Rehabilitation Project resulted in 5 metric tons of GHG emissions reductions.

## **2015 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

- Used Precision Concrete Cutting to grind down trip hazards on sidewalks throughout Town.
- LED lighting exchange program. Over time, the Facilities Management Division is working to decrease electric usage by changing to LED lighting as old bulbs and fixtures wear out.
- Shandoka Parking Lot lighting change to LED. This project has not yet been implemented fully; although, the fixtures were purchased in 2015. The fixtures will be installed in spring 2016.
- With funding for materials from the Colorado Water Conservation Board's small grants program, 134 toilets in the Shandoka Affordable Rental Housing Complex were changed out for 1.2 gallon per flush toilets. Let potable water use results in less need for electricity to produce potable water over time. The water savings will be tracked in the annual Water Audit report.
- Town Park Pool and Restroom Improvement projects tracked construction waste mitigation progress. EcoAction Partners calculated that good construction practices resulted in 12 metric tons of GHG emissions reductions.

## **2014 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

- On March 4, a programmable thermostat was installed in Old Town Hall.
- On March 4, window shades were installed on all windows in Old Town Hall to control excessive heating from sunlight
- Used Precision Concrete Cutting to grind down trip hazards on sidewalks throughout Town. A total of 75 cuts were made, as well as a driveway cut section for the Ace Hardware Store. This saved literally tons of concrete from being excavated and replaced.
- November 24 replaced 24 high pressure sodium yard lights at the Public Works Facility with 12 LEDs.
- Shandoka Management purchased solar panels in the CEC-SMPA Community Solar Array to offset energy use of all Shandoka electric meters.
- The Affordable Housing Fund purchased solar panels for Town deed-restricted housing that expressed interest in exchange for specific energy use information.
- The Planning Director developed a Climate Action Plan that encompasses the entire community, which will be adopted by the Telluride Town Council.

## **2013 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

- In February, the office paper used by Town government offices switched from 30% post-consumer content recycled to 50% and then to 100%.
- In March, changed all lights at the Historical Museum to LEDs. (Note: This building is not counted in the Town's Carbon Footprint to date.)
- In July, at Rebekah Hall skylights, applied an exterior coating "film" that is chemically applied. It is reflective therefore, in addition to UV protection it is anticipated to reduce the amount of heat passing through, thereby reducing the energy needed for cooling in the summer.
- On November 11, switched the water heater at the Hanley Pavilion in Town Park from a 150-gallon electric tank to a 93% efficient 50-gallon electric tank.
- In late December, installed window inserts to better seal the building envelope of Rebekah Hall and Old Town Hall.

## **2012 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

### General

- Purchased all available Renewable Energy Credits from SMPA that are available through their power purchase of energy generated at the Bridal Veil Power Station, which is owned and operated by Idarado.
- The Personnel Board amended the Personnel handbook to lay out expectation for all employees regarding recycling and energy use minimization.
- Much of staff continues to use public transit, carpooling, or human-power to get to work.
- Parks Management continues to attend Rebekah Hall meetings on foot or using bicycles.
- Public Works staff continues to carpool to do errands in Town from the Facility, when possible.
- All Town facilities are recycling #1-7 plastics, corrugated cardboard, aluminum, glass, and paper.
- Public Works recycles all batteries, tires, fluorescent bulbs, metal, and computers for the Town facilities.

### Public Works

#### Water/Wastewater

- In June Financial Energy Management (FEM) conducted a lighting Audit of the Telluride Regional Wastewater Treatment Plant.

- On October 16 and 17 for \$14,260 (this leaves \$7,740 on our table) FEM completed a Lighting Upgrade at the WWTP. The estimated direct annual energy savings is about \$2,100 per year, making the estimated net payback period about 6 years (ROI 16%). Those are the financial perspective. From the environmental perspective, anticipated environmental impacts of this project as detailed by FEM are as follows:

Energy Saved = 18,837 kWh per year  
 KW reduced by = 14 kW  
 CO2 reduction = 5 tons per year  
 SO2 reduction = 13 lbs per year  
 NOX reduction = 15 lbs per year

#### Public Works & Transit Facility –

- In June Financial Energy Management (FEM) conducted a lighting Audit of the Public Works & Transit Facility. No lighting upgrade was completed as no funds were available.

#### Public Works Projects –

- Sidewalk Trip Hazard Repair. By repairing rather than replacing concrete panels, reduced estimated generation of CO2 created by project by 1.3 metric tons.
- Carhenge resurfacing experiment using local materials and no hauling.
- Water heater replacement.

#### Rebekah Hall

- Green Meeting Room lighting was upgraded to dimmable LEDs.
- All electric Exit signs were upgraded to LEDs.
- Water heater replacement.
- HVAC system replacement.

#### Museum

- Installed Ecogreen 1-gallon power flush toilet at the Museum on October 22, 2012.

#### Shandoka

- April - Completed an energy audit on all of the buildings.
- Shandoka staff began implementing recommendations of the audit. E.g., increasing/replacing insulation, replacing windows, sealing cracks and leaks, etc.

### **2011 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

Much of staff is using public transit, carpooling, or human power to get to work.

Parks Management continues to attend Rebekah Hall meetings on foot or using bicycles.

Public Works staff continues to carpool to do errands in Town from the Facility, when possible.

All Town facilities are recycling #1-6 plastics, corrugated cardboard, aluminum, glass, and paper.

Public Works recycles all batteries, tires, fluorescent bulbs, metal, and computers for the Town facilities.

#### **General –**

- As an experiment, Staff replaced 10 cfl tube lights with 10 LED tube lights in buildings where emergency lights are required 24/7.
- All outdoor spot safety lights on all buildings were changed out to LED spotlights.
- The Personnel Board considered a request to put wording in the Personnel Handbook regarding expectations for all employees regarding recycling and energy use minimization (i.e., resource use).

#### **Water/Wastewater –**

- Electricity – Completed installation of a 100-kW solar system on the Telluride Regional WWTP. Electric generation started up in late January 2011.

#### **Shandoka –**

- Insulated the hot water pipes in the crawl spaces under A and B buildings, December 2011. (This should show up as a 2012 reduction in natural gas use on the building B meter (the A building meter is only the laundry room). Building F was completed in January. Building C, D & E are schedule for summer 2012. G & H were insulated at original construction.

### **2010 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

Much of staff is using public transit, carpooling, or human-power to get to work.

Parks Management continues to attend Rebekah Hall meetings on foot or using bicycles.

Public Works staff continues to carpool to do errands in Town from the Facility, when possible.

All Town facilities are recycling #1-6 plastics, corrugated cardboard, aluminum, glass, and paper.

Public Works recycles all batteries, tires, fluorescent bulbs, metal, and computers for the Town facilities.

#### **Town Park Electricity –**

- In May, the Parks & Recreation Department reworked the plumbing on the Town Park Pool, which has increased the efficiency and effectiveness of the filter pumps.
- Hanley Pavilion** – In October, the Parks & Recreation Department worked with TNCC to install the *Reallce®* System to make ice more efficiently.

- **Hanley Pavilion** – In October, the Parks & Recreation Department replaced the lights in the rink area with more efficient bulbs that can be dimmed and will require less maintenance/replacement.

**Shandoka –**

- Installed fiberglass jackets on water heaters for buildings C, D, E, and F.
- Routinely install compact fluorescents at Unit Turns
- Energy Star appliances used for all replacements.
- Laundry Room upgrades – washers and dryers.

**Water/Wastewater –**

- Electricity – Moved forward on installation of a 112.8 kW solar system on the Telluride Regional WWTP. Electric generation started up in late January 2011.

**Special Note on Affordable Housing Projects (Entrada and Gold Run) –**

While affordable housing units are built by the Town, they are not town-owned facilities once they are sold. Nevertheless, it is important to document the efforts to make housing in Telluride, in general, more energy efficient and sustainable. The following was provided by Lance McDonald, Program Manager, as a summary:

*The Project was designed to meet the “Town of Telluride Energy Efficient and Environmentally Responsible Building Code.” Following is a listing of “green” or sustainable products and practices incorporated into the Project.*

*Energy Efficiency: building product installation techniques for a properly sealed envelope; high efficiency natural gas boiler systems (95% efficient) with in-floor and baseboard radiant heat; Energy Star rated appliances and lighting fixtures (~90%); mostly compact fluorescent light fixtures; insulation of hot water pipes at specified locations, R-50 roofs, R-24 wall.*

*Materials: recycled-content or certified wood deck material; aluminum-clad wood, low-E glazed windows; fiber cement siding; natural linoleum, tile, concrete, or wood in lieu of vinyl for flooring; and recycled-content carpet with recycled-content carpet pads.*

*Indoor Air Quality: formaldehyde-free insulation; low-toxic, solvent-free adhesives; and low VOC paints and stains.*

*Resource Conservation: construction recycling area and practices; energy saving water fixtures/fittings.*

**2009 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

All staff appeared to increase use of public transit, carpooling, or human power to get to work.

Parks Management attended Rebekah Hall meetings on foot or using bicycles.

When possible, Public Works staff carpooled to do errands in Town from the Facility.

Transit shift changes used the Electric Vehicles as often as possible.

Less paper use: 2-sided copying and printing are the norm for Town operations, as is heavier reliance on email.

Public Works has instituted a cloth towel option in the kitchen and ladies room to cut down on paper towel use.

Public Works has instituted #5 plastics recycling campaign.

Public Works has instituted a coffee grounds composting campaign.

**Carhenge Parking Lot**

- Electricity – In late December, the current was changed from 220V to 110V. Then, all High Pressure Sodium light ballasts were removed and 130 watt equivalent CFLs were installed. It is the intent of Public Works to replace the CFLs with LEDs when the CFLs wear out (about 2 years) and appropriately colored LEDs become available.

**2008 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

All staff appeared to increase use of public transit, carpooling, or human power to get to work.

Parks Management attended Rebekah Hall meetings on foot or using bicycles.

When possible, Public Works staff carpooled to do errands in Town from the Facility.

Transit shift changes used the Electric Vehicles as often as possible.

**Telluride Regional Wastewater Treatment Facility –**

- Electricity
  - In December, removed a water fountain with an electric cooling system that was not used but operated continuously.
- Heat
  - Installed a heat recovery system at the effluent stream to heat the offices in July. Expanded the system to heat all of the areas except the Dog Pound in November.

**Old Town Hall –**

- Electricity

- Replaced the old computer server with a more efficient system.
- All staff systematically turns off lights when leaving office for lunch or meetings.
- Copy machine turned from “sleep” mode to “off” mode each night.
- All computers and monitors turns to “off” mode each night.

## **2007 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

All dead fluorescent and CFL bulbs are sent to a state-of-the-art recycling/recovery facility.

All dead computers and peripherals are sent to a state-of-the-art recycling/recovery facility.

Use 2-sided copying.

When possible, copy on the clean side of used paper.

When possible, send intra-office mail in a way to enable the reuse of the envelope.

When possible, use email in lieu of paper copies.

Rebekah Hall –

- Lights
  - Changed all lights in Council Chambers
    - T12s to T8s
    - Canned lights from a mix to a standard Green Bulb
  - Changed all lights in Computer Room from T12s to T8s
  - Changed lights in Green Room to CFLs w/dimmer
  - Changed all lights on 1<sup>st</sup> Floor from T12s to T8s
- Water Heaters
  - Put water heater on a timer to run 4 hours per day. (7 am – 11 am) *[Recommend to replace with a smaller tank electric heater or an on demand heater, depending on available technology.]*
  - Lowered water heater temperature from 140° F to 110° F
- Building Heating/Cooling
  - Scheduled maintenance of furnaces (filter changes, oiling motors)
  - Set building heating at 68° F daytime and 65° F at night.
  - Disconnected redundant electric floorboard heaters in Council Chambers.
  - Opened all dampers in all offices to ensure more even heating throughout building.
  - Cleared obstructions from in front of all heating vents in building. Louvers can be manually shut, if desired.
- Added an electric vehicle for the Manager’s Office use.

Old Town Hall –

- Lights
  - Changed most lights from T12s to T8s
- Building Heating/Cooling
  - Scheduled maintenance of furnaces (filter changes, oiling motors)
  - Set building heating at 68° F daytime and 65° F at night.
  - Disconnected redundant electric floorboard heaters
  - Cleared obstructions from in front of all heating vents in building. Louvers can be manually shut, if desired.
  - Sealed and caulked leaks prior to repainting and replacement of damaged siding.
  - Installed new seal plate between crawl space and floor of building.
- Appliances
  - Replaced 1 old refrigerator with a smaller volume EnergyStar refrigerator.
- Computers
  - Started turning off computer electronics when not in use
- Water Heaters
  - Put water heater on a timer to run 6 hours per day.
  - Lowered water heater temperature from 140° F to 110° F

Public Works & Transit

- Facility
  - Computers
    - New Policy: All computers, monitors, and printers turned off each night.
  - Lights
    - Put all restroom lights on motion detectors
    - Installed a 20-minute maximum timer on the gas pump lights
    - Office lights used only when necessary; not turned on automatically, taking advantage of natural light through windows.
  - Appliances
    - Replaced the office refrigerator with an EnergyStar refrigerator when the old one broke down.

- Vehicles
  - Retired Ford Ranger Pick Up (estimated EPA mileage 20 mpg) and replaced it with an all-electric vehicle
- Water Heaters
  - Lowered water heater temperature from 140° F to 110° F
- Building Heating/Cooling
  - Cleaned vents.
  - Cleaned furnace.
  - Replaced thermostat in Old Bus Barn to not exceed 70° F
  - Turned off 2 of 4 hanging gas heaters in the Old Bus Barn. Heaters are turned off completely from May until October.
  - Turned off 2 of 4 hanging gas heaters in the New Bus Facility during winter. Heaters are turned off completely from May until October.
  - Installed timer for the wash pad heating system. Minimizing use of wash pad heating system.
- Disconnected electric baseboard heater at Shandoka Bus Stop.
- Carhenge
  - Restroom heaters can be turned completely off after winter.
  - Restroom fixtures are all water saving.
  - Restroom lighting is solar LED.
  - Restroom insulation is spray on foam.
  - Parking Lot lighting switched to a timer from a photocell, which decreases hours of lighting to conform with hours of operation.
  - Parking Lot light bulbs switched to 70-watt low pressure sodium. Unfortunately, the ballasts will not support this change and the bulbs must be changed back to 100 watts. *[Recommend changing out the ballasts to support a 70-watt lps.]*
- Residential Streetlights
  - Replaced 13 of 24 SMPA-owned cobrahead (high pressure sodium) streetlights with dark-skies compliant fixtures with 26-watt CFLs.
- Commercial Street Lights
  - Completed conversion of all bulbs to 100-watt equivalent CFLs.
  - All streetlights on photocells
- Bike Path Tunnel
  - Put lighting on solar (underway).

#### Shandoka

- Changed all lights from incandescent to 60-watt equivalent CFLs outside and 40 watt equivalent inside. Will change all lights within 2 years to ensure efficiency remains high, as recommended. (And instituted a policy that requires all light bulb purchases to be CFLs & made at the front desk at the special low price of \$1.80 each.
- Began recycling computers, TVs and appliances.
- All appliances installed are EnergyStar.
- Heating boiler system for each building was inspected. The older systems were completely overhauled.
- Replaced all laundry room facilities with EnergyStar washers (24) and dryers (12).

#### Parks & Recreation Department

- Water Heaters
  - Lowered temperature from 140° F to 110° F on all water heaters: (1) Pavilion, (2) Office, (3) Shower Rooms, (4) Nordic Center Office, (5) Warming Hut.
- Building Heating/Cooling
  - Scheduled furnaces servicing.

#### Youth Link

- None

#### Marshals Department (New remodel starting 2007 January)

- All lights are T8s
- All appliances EnergyStar

#### Old Marshals Building

- Kept heat at 70° F.
- Completely turned off hot water heater, unless building is occupied.
- Disconnected flag spotlight.

### **2003 - 2006 – Town Government Actions to Lower CO<sub>2e</sub> Generation by Energy Use**

Recycling at all facilities.

Low water usage fixtures at all facilities.

Rebekah Hall –

- Began to replace T12s with T8s.
- Insulated water heater pipes in crawl space.

Old Town Hall –

- Changed some lights from T12s to T8s

Public Works & Transit

- Facility
  - Installed programmable thermostats.
  - Put the soda machine on the VendingMiser so that it does not run 24/7.
- Residential Streetlights
  - Nothing
- Commercial Street Lights
  - Started conversion of all bulbs to 100 watt equivalent CFLs. (2005)
  - All streetlights on photocells (when installed)

Wastewater and Water Division of Public Works

- Some T12 lights converted to T8s.

Shandoka

- Was not under Town Management prior to 2007.

Parks & Recreation Department

- None

Marshals Department

- None

Youth Link

- None

## “Green” Purchasing Specifications (implemented starting 2008)

As a result of the Ecology Commission’s recommendation to develop more specific purchasing specifications for commonly used office materials, Town Council directed staff to develop a list of typical products with the desired specifications, and to complete a budget analysis comparing the more sustainable products with the traditional products. The table that is provided on the next page and the subsequent product sheets satisfies this task. After a cursory analysis of available web sites, it is obvious that products with recycled content and chlorine-free and low-chemical processing are readily available—sometimes at a lower price than their traditional counterparts. The Office Depot website is easiest to use when looking for more sustainable alternatives to traditional products. However, Quill and OfficeMax both have recycled products available. They are just more difficult to find, at times. The bottom line is that given the assumptions of use, it would be possible to adopt the specifications in the second column of the table for less than \$500 more over the course of 2008. This seems imminently reasonable and therefore I would recommend that these minimum specifications be adopted as soon as possible.

### Cost analysis of more sustainable purchasing of commonly used office supplies with more traditional products

Item	Specification	Potential Supplier	Cost Analysis			
			Preferred Product	Traditional Product	Per Unit Cost Difference	Annual Cost Difference
Copy paper	1. Minimum 35% post-consumer recycled content 2. Process chlorine free (PCF)	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$35.99/case	\$32.99/case, for 10% recycled content	\$3.00/case	\$300.00/yr, assumes 100 cases/yr
3-M Post It Notes, 3”X3”	1. Minimum 30% post-consumer recycled content 2. Minimum 100% total recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$10.99/dozen	\$9.99/dozen	\$1.00/dozen	\$10.00/yr, assumes 10 packs of a dozen pads/yr
Clasp Envelopes, 6”x9”	Minimum 20% post-consumer recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$8.99/box	\$7.39/box	\$1.60/box	\$16.00/yr, assumes 10 boxes/yr
Clasp Envelopes, 9”x12”	Minimum 20% post-consumer recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$5.99/box of 100	\$6.99/box of 100	-\$1.00/box	(-\$10.00/yr), assumes 10 boxes/yr
Standard Blank, white envelopes	Minimum 30% post-consumer recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$7.99/box of 250	\$9.99/box of 250	-\$2.00/box	(-\$4.00/yr), assumes 2 boxes/yr
Markers & highlighters	Water-based inks	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$6.29/pack of 12	\$7.29/pack of 12	-\$1.00/pack	(-\$5.00/yr), assumes 5 packs/yr
Writing pads	Minimum 50% total recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$9.99/dozen for 8.5”x11”**	\$9.99/dozen for 8.5”x11”**	\$0.00	\$0.00
File folders	1. Minimum 50% post-consumer recycled content 2. Minimum 100% recycled content	Office Depot* <a href="http://www.officedepot.com">www.officedepot.com</a> Quill** <a href="http://www.quill.com">www.quill.com</a>	\$16.49/box of 100**	\$9.99/box of 100 with 10% recycled content *	\$6.50/box	\$58.50/yr, assumes 9 boxes/yr or 1 box/department
Hanging file folders	Minimum 10% post-consumer recycled content	Office Depot <a href="http://www.officedepot.com">www.officedepot.com</a>	\$10.99/box of 25	Could not find a comparable product without 10% recycled content		\$0.00
<b>TOTAL ESTIMATE COST DIFFERENCE PER YEAR</b>						<b>\$ 335.50</b>