

Millvale Borough Climate Action Plan

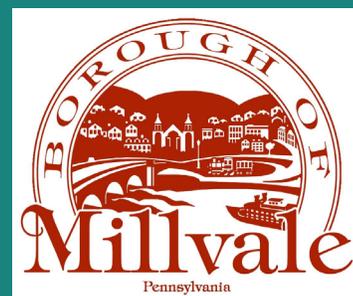


Local Actions and Policies to Reduce Millvale Borough's Greenhouse Gas Emissions

Approved by Borough of Millvale
August 11, 2020

Produced by Millvale Borough CAP Task Force

Through partnership with ICLEI – Local Government for Sustainability (ICLEI)



Credits and Acknowledgments

Local Government Officials and Staff

- Brian Wolovich, Millvale Borough Council, Committee Chair
- Ed Figas, Millvale Borough Administration, Borough Manager, Floodplain Administrator
- John Roth, Millvale Borough Administration, Zoning and Development Director, Zoning Office
- Brian Spoales, Millvale Borough Council, Mayor

External Agencies and Partners

- Lucas Skiba, Pennsylvania State University
- Heidi Kunka, Pennsylvania Department of Environmental Protection
- Calyn Hart, ICLEI – Local Governments for Sustainability USA
- Jesse Carpentier, ICLEI– Local Governments for Sustainability USA

Plan Contributors

- Anna Rosenblum, EvolveEA, LEED AP, EcoDistricts AP, LFA
- Zaheen Hussain, New Sun Rising, Director of Sustainability

This Climate Action Plan was made possible through a grant agreement between ICLEI – Local Governments for Sustainability and the PA Department of Environmental Protection, which was funded by the US Department of Energy State Energy Program. The template was developed by ICLEI – Local Governments for Sustainability, USA and was originally published in April 2018. It was later edited by PA Department of Environmental Protection in December 2019.

The icons are licensed under Creative Commons Attribution 3.0 Unported from Smashing Magazine.

Table of Contents

1. Introduction	Error! Bookmark not defined.
Statewide Climate Action	6
Purpose and Scope of the Climate Action Plan	7
Planning Process	8
Vision Statements and Objectives	12
2. Co-Benefits of Climate Action	15
1. Improving Public Health	15
2. Saving Money and Reducing Risk.....	15
3. Enhancing Resource Security.....	15
4. Creating Jobs.....	16
5. Fostering Social Equity	16
3. Millvale Borough's GHG Emissions	17
Millvale Borough Community-Wide GHG Emissions.....	17
Forecasting Millvale Borough's GHG Emissions.....	18
Millvale Borough's GHG Reduction Target	22
The Millvale Borough Climate Action Plan.....	22
4. Taking Action.....	25
Emissions Reduction Potential	25
Evaluating Co-Benefits	25
Supporting Actions	26
New and Existing Actions	26
Consistency with Statewide Climate Action Plan.....	26
Climate Adaptation	26
5. Commercial Energy	27

6. Residential Energy	29
7. Industrial Energy	31
8. Solid Waste Management	33
9. Water & Wastewater Management	35
10. Transportation	37
11. Climate Adaptation	39
Anticipated Climate Impacts	39
Adaptive Greenhouse Gas Reduction Measures.....	40
12. Monitoring Plan	42
13. References.....	43
Appendix I: Methodology	45
Appendix II: Climate Change Science	46

Executive Summary

With seasonal variations and catastrophic natural disasters becoming more intense and frequent, climate change threatens the health, safety, and overall well-being of communities across the globe. The Commonwealth of Pennsylvania and Millvale Borough are no exception. The Millvale Borough recognizes a growing need to address its own contribution to climate change, as well as adapt to the impacts that will occur and be exacerbated, absent local greenhouse gas reduction. This Climate Action Plan includes an inventory of the Millvale Borough's greenhouse gas emissions (GHGs) from community-wide activities, establishes an emissions reduction target, and outlines feasible actions to achieve that target. In addition, the Plan identifies ways in which GHG reduction actions can further the Millvale Borough's ability to adapt to climate change impacts. While this plan is not focused on adaptation, it ensures that GHG measures are not counteractive to the Millvale Borough's future resilience and will hopefully be a catalyst for developing a robust strategy towards that end.

The vision of the climate action plan (CAP) is to transition Millvale Borough to be a sustainable community through improving its energy, food, water, air, mobility, and equity. To continue reducing GHG emissions the community decided to become energy independent through the implementation of solar and other renewable energy resources, starting with efficiency and building performance. With the development of the Triboro Ecodistrict Pivot Plans, Millvale Borough is working toward becoming a water town with green storm water infrastructure which includes productive water parks, rain gardens, and bioswales (EvolveEA, 2019). Food is another important aspect of the community where the need for local production is essential, currently Millvale does not have a grocery store within its borough. With help from the Millvale Community Development Corporation (MCDC) and other organizations including New Sun Rising they are working on *The Town Square Project*. The goal of this project is to renovate an abandoned building on Millvale Borough's main street into a fresh food hub (EvolveEA, 2019). Girty's Woods, which connects Millvale Borough and Reserve Township, is currently under a conservation project with Allegheny Land Trust (ALT) and other local, state, private, and municipal supporters to save 155 acres of woodlands. Girty's Woods is important for preservation to protect wildlife and other forms of biodiversity, as well as reducing this regions carbon impact. It also acts like a sponge to collect heavy precipitation and flood waters from over running Girty's Run Watershed (ALT, 2020). The

implementation of Millvale Borough's CAP will mitigate/adapt strategies to climate change impacts, while reducing GHG emissions, and empowering community engagement and equity.

In the fall of 2019 The Pennsylvania Department of Environmental Protection (PADEP) and the International Council for Local Environmental Initiatives (ICLEI) started the Pennsylvania Climate Action Assistance Program. This allowed college students to work alongside local governments to develop a CAP specific to their local communities. By the end of 2019, Millvale Borough developed GHG emission inventories for the base years of 2016 and 2017. The inventories included the emissions from residential, commercial, industrial, water/wastewater, solid waste, and transportation energy sectors. The largest emissions come from the residential and transportation energy sectors, which results from the use of electricity and vehicle miles traveled (VMT). In the 2017 GHG inventory residential energy consisted of 24% (13,819 CO₂e) and transportation consisted of 49% (28,354 CO₂e) in GHG emissions. With these two energy sectors making up almost 75% of the of the GHG emissions we can focus on mitigation/adaptation strategies that will help the community reduce these energy sector emissions to meet the reduction goals. Using ICLEI's ClearPath tool the Millvale Borough Task Force quantified its GHG emission inventories with factor sets that forecast projections of future emissions using different scenarios, including business-as-usual (BAU). The factor set used for the BAU forecast projects that the population of Millvale Borough has been declining around 0.4% every five years. This causes a slight GHG emission reduction in each energy sector, but does not align with our target GHG emission reductions for 2050 (ICLEI, 2020).

This Climate Action Plan meets the reduction target outlined in the Commonwealth of Pennsylvania's 2018 Climate Action Plan. These GHG emission reduction targets are 26% by 2025, and 80% by 2050 which will align with legislative changes and environmental policies. Both the Pennsylvania and Millvale Borough CAPs will address GHG emission trends, evaluate cost effective strategies for reducing GHG emissions, identify cost/benefits/co-benefits of reduction strategies, and require to update the plan every 3-5 years (PADEP, 2018). The difference is Pennsylvania's CAP will be focused on a statewide GHG emission reduction, while this CAP will be created specifically for Millvale Borough's community. The goals for both of these CAPs are to focus on creating reduction strategies that reduce climate change impacts, are cost effective, use community engagement, and are equitable for all residents/citizens.

Climate change is the greatest environmental challenge of the 21st century, with overwhelming evidence in the past decade. It poses a serious threat not just to Millvale Borough's natural resources, but also to our jobs and our health. Climate action also presents huge opportunities for creating a healthier, safer, and more equitable zero-carbon world. Millvale Borough has an unparalleled opportunity to make changes in ways that

create jobs and benefit all residents. Scientists expect that with the current trends in fossil fuel use, Americans may see more intense heat waves, droughts, rainstorms, floods, wildfires and landslides in the future. These impacts could drag down our economy, stress our natural resources and worsen inequities facing many Americans. Action is required at all levels, and local governments have a unique role to play in building low-carbon communities. In Pennsylvania, temperatures have increased by more than 1.8°F since the early 20th century and are expected to increase by an additional 5.4°F by 2050. Similarly, annual precipitation in Pennsylvania has increased by approximately 10% since the early 20th century and is expected to increase by another 8% by 2050, with a 14% increase during the winter season (Shortle et al. 2015).

These impacts are caused by the accumulation of greenhouse gas (GHG) such as carbon dioxide (CO₂) and methane (CH₄) in the atmosphere, primarily resulting from burning fossil fuels and land use changes. Although the natural greenhouse effect is needed to keep the earth warm, a human enhanced greenhouse effect with the rapid accumulation of GHG in the atmosphere leads to too much heat and radiation being trapped. Carbon emissions from human activities have continued to rise in recent decades, reaching the highest rates in human history between 2000 and 2010 (Intergovernmental Panel on Climate Change (IPCC), 2014). About half of all carbon dioxide emitted between 1750 and 2010 occurred in the last 40 years. The energy, industry and transportation sectors have dominated the rise in emissions. In Pennsylvania, the sectors responsible for the most GHG emissions are industrial at 31%, electricity production at 30%, and transportation at 23% (Pennsylvania Department of Environmental Protection (PA DEP), 2019). With the current trajectory of population growth, urbanization, and reliance on personal vehicles, emissions will only continue to rise. Given the critical impacts of climate change on humanity, the time to act to reduce GHG and our carbon footprint is now.

In addition to national and state efforts to make systemic changes that will reduce global emissions, local governments can play a powerful role in addressing climate change. The design of American communities—how we use our land, how we design our buildings, how we get around—greatly impacts the amount of energy we use and the volume of GHG emissions we produce. It is critical that communities like Millvale Borough demonstrate that it is possible to dramatically reduce GHG emissions while creating more vibrant and prosperous places to live and do business.

Statewide Climate Action

In 2008, the Pennsylvania Climate Change Act was passed, and requires the Department of Environmental Protection (DEP) to (1) develop an inventory of GHG emissions and update it annually; (2) administer a Climate Change Advisory Committee; (3) set up a voluntary registry of GHG emissions; and (4) prepare a Climate

Change Action Plan and Climate Impacts Assessment, both to be updated once every three years. The most recent Climate Impacts Assessment was updated in 2015, and the most recent Climate Action Plan, as well as greenhouse gas inventory, were released in 2019. These documents offer information and guidance for local climate action planning in the Commonwealth. The Climate Impacts Assessment provides a scientific basis for potential statewide impacts of global climate change, which can be used alongside available local data to inform community adaptation efforts. The PA Climate Action Plan summarizes statewide greenhouse gas emissions, sets an emissions reduction target, and describes potential mitigation and adaptation actions for residents and businesses, as well as local and state government. The reduction targets are 26% by 2025 and 80% by 2050 from 2005 levels, consistent with an executive order signed by Governor Wolf in 2019 (PA DEP, 2019).

To ensure consistency with the PA Climate Action Plan, Millvale Borough's reduction targets meet the statewide targets. In addition, many of the statewide actions were incorporated into this plan, which is described further in Chapter 4: *Taking Action*.

Purpose and Scope of the Climate Action Plan

Millvale Borough is joining an increasing number of local governments committed to addressing climate change at the local level, in particular through its support to the Triboro Ecodistrict. Along with a cohort of 19 other jurisdictions in the Commonwealth of Pennsylvania, Millvale Borough began the climate action planning process in 2019. College students were matched with staff from each jurisdiction and were trained by ICLEI USA on each component of the climate action planning process. They worked together to develop individual climate action plans. ICLEI's technical guidance was enabled via a grant from US Department of Energy State Energy Program through the PA Department of Environmental Protection.

The Millvale Borough recognizes the risk that climate change poses to its residents and businesses, and is acting now to reduce the GHG emissions of both its government operations and the community at-large through the innovative programs laid out in this Climate Action Plan. Furthermore, it is recognized that Millvale Borough needs to address existing climate risks such as flooding, water quality, pollution, and landslides and adapt its systems and infrastructure to new conditions. This Climate Action Plan takes advantage of common-sense approaches and cutting-edge policies that our local government is uniquely positioned to implement – actions that can reduce energy use and waste, create local jobs, improve air quality, preserve our local landscape and history, reduce risk to people and property, and in many other ways benefit Millvale Borough for years to come.

Purpose

By creating a clear course of action so that everyone has a role in creating and achieving climate and sustainability goals, our Climate Action Plan drives and coordinates local efforts toward a reduction in GHG emissions of 2017 levels by 2025 and 80% percent below 2017 emission levels by 2050.

The Climate Action Plan is a framework for the development and implementation of actions that reduce Millvale Borough's GHG emissions. The Plan provides guiding objectives and actions to realize Millvale Borough's GHG reduction goal.

In addition to addressing mitigation concerns, the Climate Action Plan considers the vulnerability of Millvale Borough to hazards that are and will continue to be exacerbated by climate change. The plan prioritizes GHG reduction measures that support climate adaptation and does not propose any actions that are maladaptive to foreseen climate change impacts.

Scope

This Plan covers objectives and actions for reducing GHG emissions resulting from local government and community-wide activities within the Millvale Borough. It addresses the major sources of emissions in Millvale Borough and sets forth objectives and actions in the following energy sectors that both the Millvale Borough and community members can implement together to reduce greenhouse gas emissions:

- Commercial Energy
- Residential Energy
- Industrial Energy
- Solid Waste Management
- Water & Wastewater Management
- Transportation
- Other

The Plan creates a framework to document, coordinate, measure, and adapt efforts moving forward. In addition to listing actions, the Plan discusses how each action will be implemented via timelines, financing, and assignment of responsibilities to departments, staff, or community partners where known.

Planning Process

While Millvale Borough has already begun to reduce greenhouse gas emissions and climate risk through a variety of actions, this plan is a critical component of a comprehensive approach to reduce the Millvale

Borough’s emissions. The planning process was based on the following overarching framework, developed by ICLEI – Local Governments for Sustainability, USA (ICLEI), and known as the Five Milestones for Climate Mitigation.

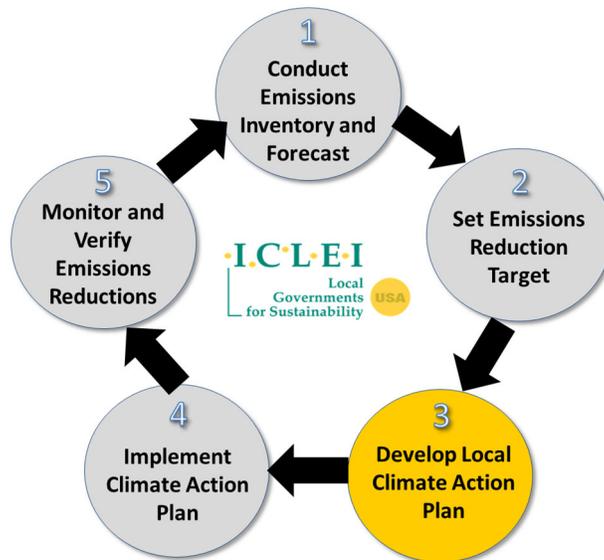


Figure 1: Five Milestones for Climate Mitigation

As indicated by the figure above, climate action planning is a continuing cycle and does not stop with the development of this document. However, this Climate Action Plan represents Millvale Borough’s first planning cycle, including the completion of the first three milestones:

Milestone 1: Chapter 3 summarizes the emissions inventory and forecast

Milestone 2: Chapter 4 sets reduction targets

Milestone 3: Chapters 5-12 outline objectives and actions

Chapter 13 also describes the initial steps of milestones 4 and 5, monitoring and implementation.

Planning Team and Stakeholders

Local government officials from Millvale Borough that are part of the planning team for this CAP are Ed Figas who is the Borough Manager, Brian Wolovich who holds a Committee Chair on the Millvale Borough Council, John Roth who is the Zoning and Development Director for Millvale Borough, and Brian Spoales who is the Millvale Borough Mayor. All of these local government officials are key assets for the planning, implementation, cost analysis, and community engagement processes of this CAP report. Zaheen Hussain who is the Millvale Sustainability Coordinator and the Director of Sustainability for [New Sun Rising \(NSR\)](#), which is a nonprofit organization located in Pittsburgh, PA who, “designs and implements programs that create economic

opportunity, solve social challenges, and strengthen the vibrancy of place” (New Sun Rising, 2020). Zaheen already has great experience in working with public engagement to implement mitigation, adaptation, and sustainability methods into communities. Anna Rosenblum is a LEED Accredited Professional, Living Futures Accredited (ILFI), and is also an EcoDistricts Accredited Professional. She works for EvolveEA which is a company that helps individuals, communities, and organizations become more sustainable through strategic action. She has worked on a project before in Millvale Borough called the Ecodistrict Pivot Plan (EvolveEA, 2019). Lucas Skiba who is a student at the Pennsylvania State University going for a Bachelor of Science in the Energy and Sustainability Policy Program. As an intern he help develop Millvale Borough’s GHG emission inventories for the base years of 2016 and 2017 through the Pennsylvania Climate Action Assistance Program.

List primary stakeholders and the organizations they represent.

- Brian Wolovich, Millvale Borough Council, Committee Chair
- Ed Figas, Millvale Borough Administration, Borough Manager, Floodplain Administrator
- John Roth, Millvale Borough Administration, Zoning and Development Director, Zoning Office
- Brian Spoales, Millvale Borough Council, Mayor

Meetings for the Millvale Borough planning team were held every 2-3 weeks during Spring 2020. These meetings consisted of developing mitigation/adaption strategies for climate impacts, vulnerabilities/hazards, and GHG emissions that are affecting Millvale Borough. The planning team decided on vision statements and GHG emission reduction targets to set goals for the target year of 2050. To achieve these goals processes of planning, implementing, and monitoring the progress of this CAP are outlined in this report. The data showing Millvale Borough’s future GHG emissions for BAU or reduction targets for 2050 were developed through ICLEI’s ClearPath tool. These projections show how GHG emissions will affect Millvale Borough depending on what climate actions are taken to implement sustainability within the community.

Social Equity

Climate equity was a core component of the planning process and will continue to be through implementation. Climate Equity ensures the just distribution of the benefits of climate protection efforts and alleviates unequal burdens created by climate change. Implementation of this concept requires intentional policies and projects that simultaneously address the effects of and the systems that perpetuate both climate change and inequity. Under the status quo, however, not everyone is given the opportunity to participate and benefit.

Communities of color and low-income populations have historically been under-served by programs and investments and under-represented in decision-making, including for the development and implementation

of climate policy. These exclusionary processes maintain or exacerbate disparities in public health; food, energy, and housing security; air and water quality; economic prosperity, and overall quality of life. These inequities primarily stem from ongoing institutional racial bias and historical discriminatory practices that have resulted in the inequitable distribution of resources and limited access to opportunities.

Climate change is likely to amplify the impacts of these existing inequities. Residents of frontline communities which often include lower income neighborhoods, communities of color, immigrants, unhoused, outdoor workers, the very young, and the elderly will disproportionately bear the burdens of climate change impacts. In addition, the many economic and health benefits of carbon reduction investments are not shared equitably across the city, especially among people of color and low-income communities.

To ensure an equitable climate action plan, Millvale Borough had a community-driven process, which is described in the following section.

Community-Driven Planning Process

[Community-Driven Climate Resilience Planning: A Framework from the National Association of Climate Resilience Planners.](#) Other resources for understanding equity principles and how to incorporate them into your planning process:

- **[U.S. Climate Resiliency Toolkit](#)**
- **[Equitable and Just National Climate Platform](#)**
- **[New York City Climate Action Plan](#)**

Some examples of how to ensure equity is a core component of your planning process include:

- **Forming a Community Working Group made up of a diverse group of stakeholders from grassroots groups, business representatives, faith and spiritual communities, and neighborhoods.**
- **Include climate equity in the overall Climate Action Plan vision and objectives.**
- **Evaluate proposed actions on whether they help to uplift climate equity and reduce disparities.**
- **Determine climate equity metrics to help track the progress made on those actions.**

In identifying which specific populations should be included in a community driven process, Millvale Borough consulted:

- The **[Pennsylvania Department of Environmental Protection’s Environmental Justice Viewer](#)**:
- The Allegheny County planning commission
- The MPO/RPO

- New Sun Rising
- Millvale Community Development Corporation
- Business Association of Millvale
- Millvale Community Library
- Emergence: A Women's Collective, Millvale

Vision Statements and Objectives

1. **Make Millvale Borough a self reliant urban solar village.**
2. **Transform our buildings into high-performing places to live, work, learn, and play.**
3. **Ensure the benefits of climate action are equitably distributed and empower historically underserved populations to participate in the process of transitioning to a carbon-free community.**
4. **Transform Millvale Borough into a place where people of all ages have the freedom to walk, bike, take mass transit, or carpool for most trips in a safe, accessible, and affordable transportation network.**
5. **Transition toward a clean, carbon-free transportation system that improves health and livability for the Millvale Borough community.**
6. **Become a leader in sustainable, smart transportation through innovative partnerships, policies, programs, and technology.**
7. **Understand potential climate-related risks and mitigate these risks while preparing our community for chronic and extreme weather events.**
8. **Millvale Borough is working to become a water town with water integrated into productive and pleasurable landscapes.**
9. **Making Millvale Borough a clean air community where people breathe easy indoors and outdoors.**
10. **Creating equity in Millvale Borough as a place of self-determination, where Millvalians are able to participate and shape their future as well as the future for Millvale.**

The Climate Action Plan offers a robust set of objectives and actions that will address the climate hazard vulnerabilities and aim for an 80% reduction in GHG emissions by 2050. Each action and objective were created

and reviewed by a group of stakeholders who considered technology limitations, funding constraints, public support, feasibility of implementation, environmental justice considerations, and other barriers.

The Borough of Millvale established the following targets to maintain a vibrant, healthy, and safe community for future generations, while improving the quality of life for those who live here today:

By 2025

- Millvale's will reduce energy use in its buildings by 10%
- Transition 100% of street lights into LED's.

By 2040

- Borough of Millvale will reduce energy use in its buildings by 20%
- 100% of Millvale's electricity will come from renewable energy
- 10% of Millvale's commuters will carpool
- 8% of Millvale's commuters will bike to work
- 10% of Millvale's commuters will walk to work
- 20% of Millvale's commuters will use public transit
- Electric Vehicles will be powered by 100% renewable energy
- Borough of Millvale will incentivize Leadership in Energy & Environmental Design (LEED) certification and/or enforce net-zero building codes for new buildings
- At least 30% of new housing units within ¼ mile of high-frequency transit are designated affordable.
- A food outlet selling fresh produce is located within a 15 minute walk of every resident
- An emergency cooling center is located within a 10 minute walk for the most vulnerable residents (based on age, income and other factors)
- 20% of jobs in transit construction and renewable energy installation are provided to residents of low-income neighborhoods, or groups that face employment challenges.
- Miles of bike lane per resident in low-income neighborhoods is equal to that in higher-income neighborhoods
- Increase annual number of households reached by low-income weatherization programs 30%
- Decrease the energy costs of low-income residents 20%
- Install roof-top solar on homes of 1000 low and moderate income residents

By 2050

- 80% of Millvale's households and businesses will participate in smart grid meter programs
- 90% of Millvale's existing buildings will complete energy-efficiency improvements
- 50% of heating fuel derived from fossil-fuels (oil, natural gas and propane) will be switched to a low-carbon fuel source and/or electric heat
- 20% of Millvale's commuters will bike to work
- 16% of Millvale's commuters will walk to work
- 18% of Borough of Millvale's commuters will use public transit
- 100% of public transportation will be carbon free
- 80% of light-duty vehicles will be electric
- 100% of [Jurisdiction]'s light- and heavy- duty vehicles will be electric or fueled by carbon-free fuel
- 100% of transportation network companies' cars (Taxis, Uber, Lyft, etc.) will be electric

1. Co-Benefits of Climate Action

Greenhouse gas reduction and climate resilience are not the only beneficial outcomes of climate action plans. The following outcomes are referred to as “co-benefits,” and they illustrate how taking action on climate change results in a more prosperous community.

1. Improving Public Health

Climate change mitigation activities, particularly those related to transportation, help to clean the air by reducing vehicle emissions and therefore improve public health. Mitigation activities help to engender a greater degree of choice for Millvale Borough’s residents. More transit options combined with transit-oriented development practices make for a more vibrant, livable community with shorter commute times and more opportunities for active transport. This creates more connected and resilient neighborhoods.

2. Saving Money and Reducing Risk

In addition to addressing climate change, measures taken to reduce greenhouse gas emissions have other important benefits. The most obvious of these is the potential for significant cost savings. In 2019, Millvale Borough spent over \$15,000 on energy to power buildings and fuel its vehicle fleet. Many of the measures in this plan pay for themselves quickly by reducing direct costs, such as fuel or energy used, and also indirect costs such as maintenance. For instance, a “right-sized” vehicle fleet is less expensive to purchase and fuel, while also being less costly to maintain. Encouraging energy efficiency, public transit use, building improvements, and other measures will also result in lower energy and water bills for residents and employers as well.

Acting now will also save on runaway costs on climate change, especially in the longer term. These costs range from infrastructure damage in extreme storms and pest control to industry losses, particularly for industries that depend on environmental conditions, such as winter sports.

3. Enhancing Resource Security

A key strategic side benefit of climate change mitigation activities is enhanced energy security through reduction in total demand. This will put less strain on the energy system as a whole as we transition to clean renewable energy. Similarly, demand shifts can help with improving water and food security as well.

Many of the actions identified here to mitigate GHG emissions will also help Millvale Borough's government, businesses, and residents to adapt to a changing climate. For example, extreme and prolonged heat waves can put considerable strain on the reliability of energy delivery in peak periods, possibly leading to service disruption during times when cooling is most needed. By increasing efficiency across the Millvale Borough, such service disruptions are less likely and the Millvale Borough will be able to better cope with those situations. Similarly, climate actions can secure food and water sources and prevent damage and service disruptions to these systems from flooding, drought, pollution, and landslides.

4. Creating Jobs

Renewable energy is a growing sector. The U.S. Department of Energy reports that sustainable tourism, green construction, and urban agriculture can provide job opportunities that didn't exist in the past. These climate protection measures can spur business and job growth during the design, manufacture, and installation of energy efficient technologies, which presents a particular opportunity to reinvest in the local economy and generate green jobs within Millvale Borough.

5. Fostering Social Equity

Social equity and justice are major concerns for addressing climate change, and thus were established as core values behind this plan. Equity is when all individuals have access to the opportunities necessary to satisfy their essential needs, advance their well-being and achieve their full potential. Environmental justice ensures fair treatment and meaningful involvement in the development of laws, policies and regulations and the identification of issues impacting vulnerable communities. As discussed in Chapter 1, Millvale Borough's community-driven planning process generated solutions that will both address climate change and ensure a better quality of life for communities of color and low-income communities.

2. Millvale Borough's GHG Emissions

Since the early 1990s, U.S. cities have developed community-wide and local government operations greenhouse gas (GHG) inventories based on accounting protocols created by ICLEI. Known as the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions and the Local Government Operations Protocol, these standards created a credible and defensible methodology which accelerated the number of inventories created and provides consistency within and across U.S. communities. In 2014, ICLEI partnered with the World Resources Institute and C40 Climate Leadership Group to create the Global Protocol for Community Scale GHG Emissions, which allows communities around the world to compare their emissions footprint.

Millvale Borough used the U.S. Community Protocol for the 2016 and 2017 GHG emission inventories. This protocol helps guide the completion of GHG inventories for local communities inside the United States. It uses emissions from businesses, residents, transportation, and local municipalities to conduct these inventories to make them as accurate as possible. It provides a detailed document that uses methods to help communities measure and report emissions within their communities to ensure the best practices are used.

Through the completion of a local emissions study, or “greenhouse gas inventory,” our Millvale Borough has determined emissions levels for the community as a whole. Community-wide emissions represent the sum total of emissions produced within Millvale Borough limits as well as emissions resulting from electricity use within the jurisdiction, even if said electricity is generated elsewhere. In this way, the community-wide figures represent all emissions for which the community is responsible.

Millvale Borough's Community-Wide GHG Emissions

The following figure breaks down community-wide emissions in [Jurisdiction]. Note that emissions from the Millvale Borough's operations are embedded within the community-wide totals. For example, emissions from government buildings are included in the “Commercial” sector and emissions from Millvale Borough fleet vehicles are included in the “Transportation” figure above. Government operations are therefore a subset of total community emissions.

CO2e By Category

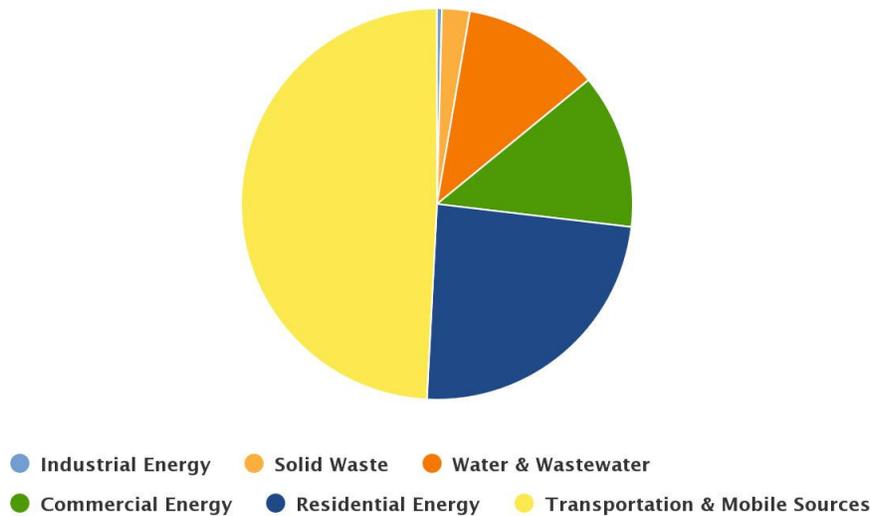


Figure 2: Millvale Borough's Community-Wide GHG Emissions 2017

Government emissions include all sources for which the local government exercises direct operational control including

Forecasting Millvale Borough's GHG Emissions

The Millvale Borough has also completed an emissions forecast based on projections of current data and expected future trends. This emissions forecast is the "Original" forecast (also known as a "Business as Usual" forecast), a scenario estimating future emissions levels if no further local action (i.e. projects within this Climate Action Plan) were to take place. The forecast indicates that, if we do not take action, GHG emissions will continue to stay stagnant or slightly decrease, but will not meet our future reduction goals. This data was formulated based on the population growth in Millvale Borough. Based on population numbers from the year 2016 it shows a decrease in population by 0.4% each year. This causes the GHG emission forecasts to slightly decrease over time, but will not be able to reduce the amount of GHG emissions for our reduction goals that are aligned with the PA CAP.

Projected Growth in GHG Emissions

Figures 3,4,5,6,7, and 8 show the projected growth in GHG emissions in Millvale Borough from 2017 to 2050. For complete information regarding the emissions inventory and forecast, including methodology and supporting data, please reference Appendix I.

Projected CO2e values

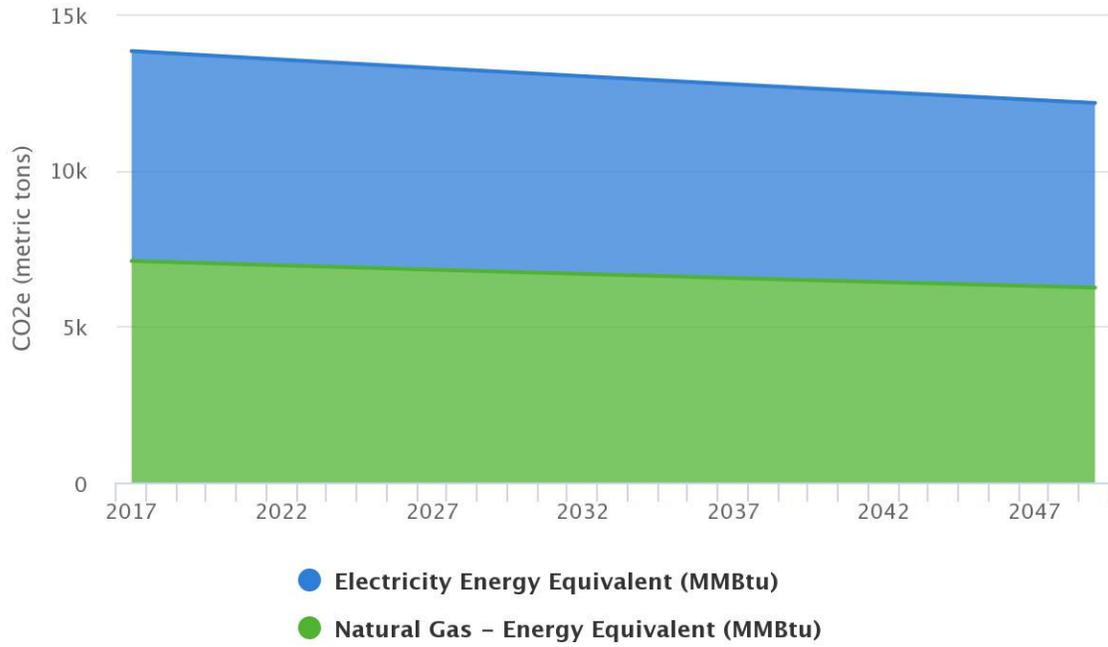


Figure 3: Projected Residential Energy in GHG Emissions from 2017 to 2050

Projected CO2e values

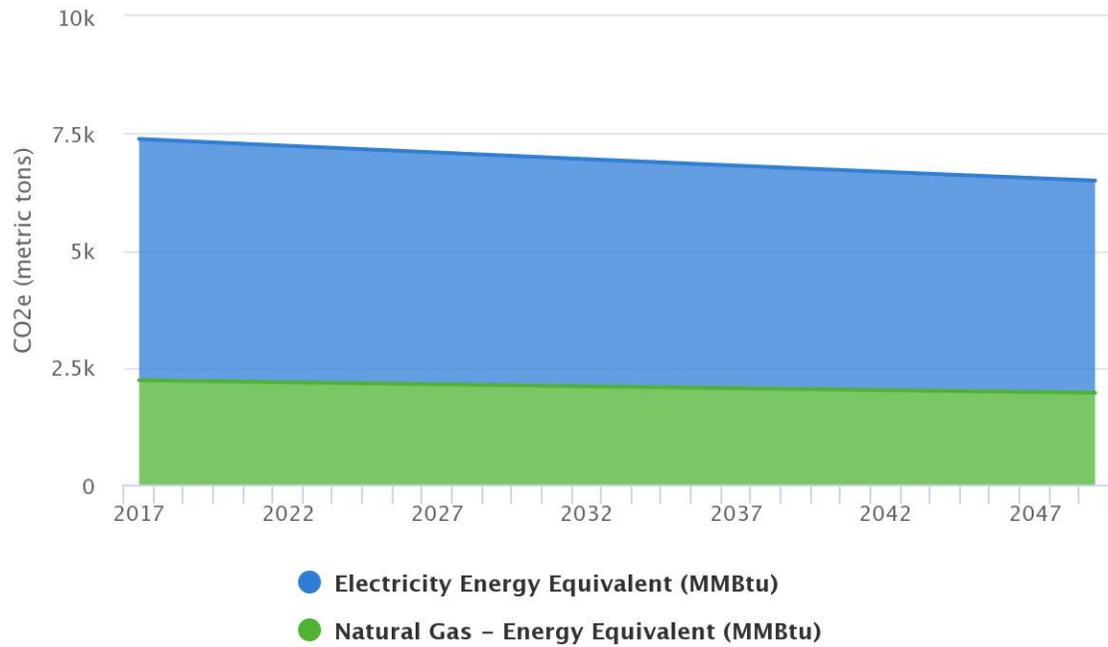


Figure 4: Projected Commercial Energy in GHG Emissions from 2017 to 2050

Projected CO2e values

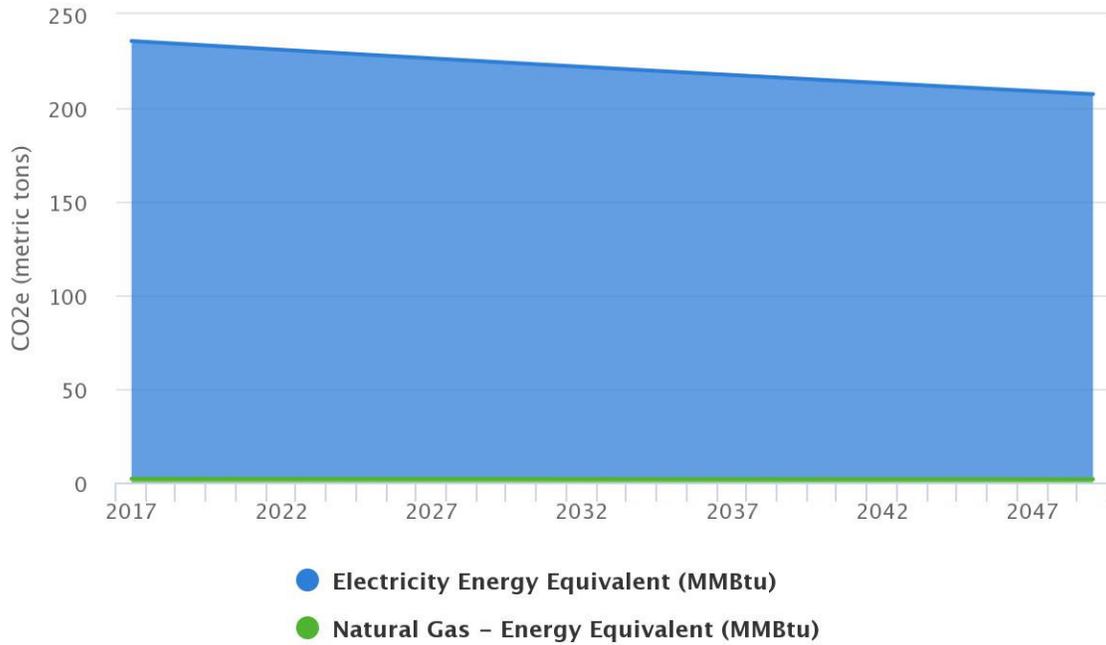


Figure 5: Projected Industrial Energy in GHG Emissions from 2017 to 2050

Projected CO2e values

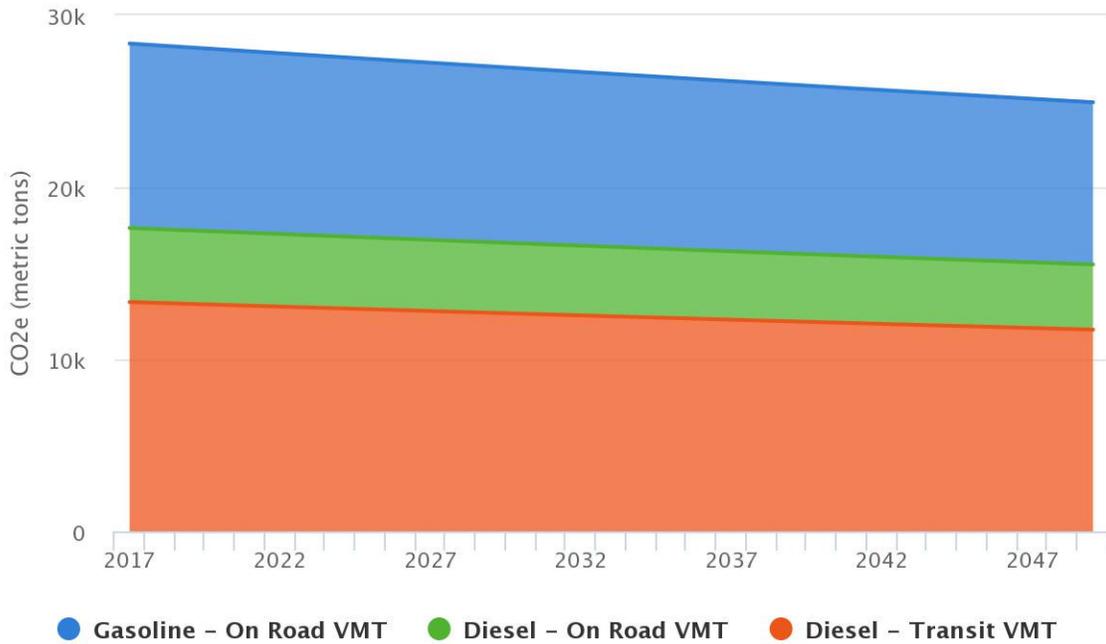


Figure 6: Projected Transportation Energy in GHG Emissions from 2017 to 2050

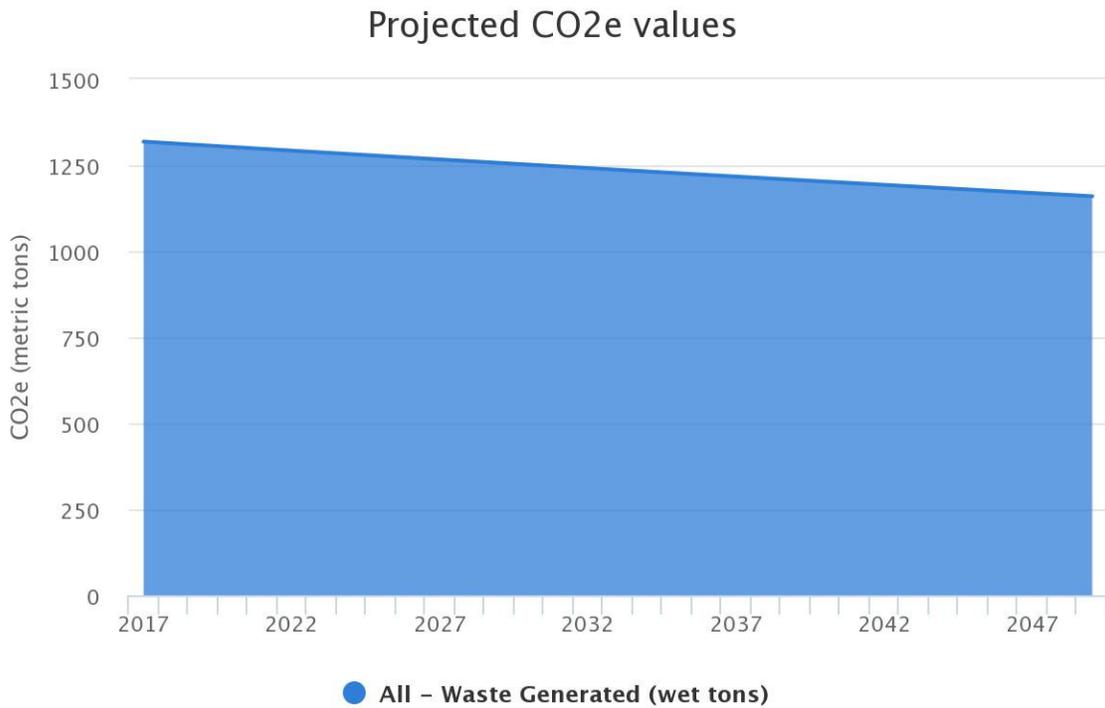


Figure 7: Projected Solid Waste Energy in GHG Emissions from 2017 to 2050

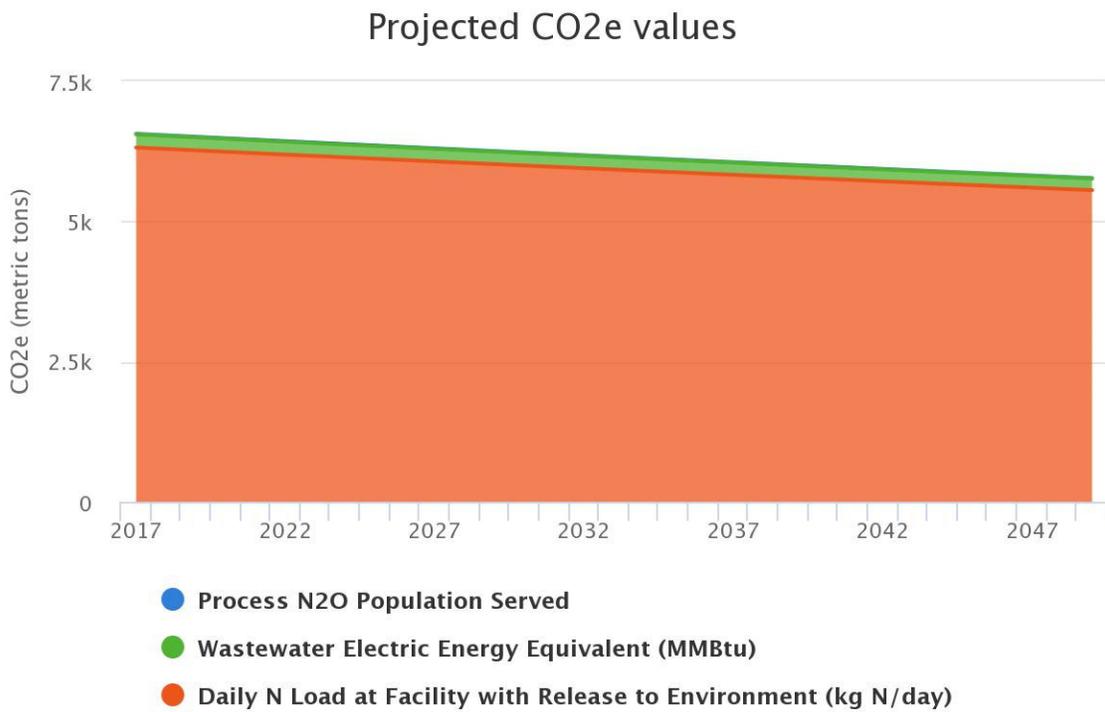


Figure 8: Projected Water and Wastewater Energy in GHG Emissions from 2017 to 2050

Millvale Borough's GHG Reduction Target

Millvale Borough has set targets to reduce its emissions to 2017 levels by 2050, or 80% percent below 2017 levels by 2050. Figure 9 compares the reduction target with the business-as-usual forecast. The combination of measures that Millvale Borough has already implemented, are currently planned, and are presented through this Climate Action Plan are designed to achieve the 2050 targets. Reductions in 2050 rely on the best information currently available pertaining to population forecasts, future changes to building codes, and vehicle fuel efficiency standards among other information.

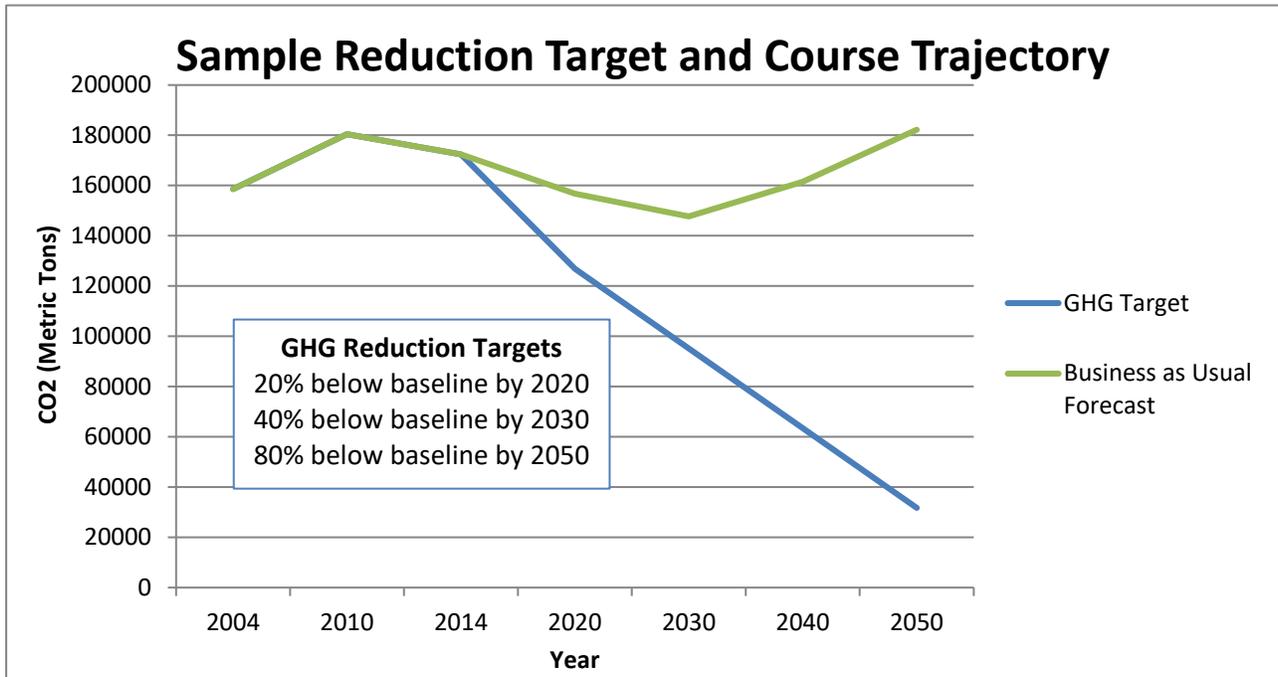


Figure 9: GHG Reduction Target

Millvale Borough's reduction target is consistent with the statewide target of 26% reduction by 2025 and 80% by 2050 from 2017 levels, as it exceeds its local percentage of the total emissions reduction needed in order to achieve that target (see Appendix I for these calculations).

The Millvale Borough Climate Action Plan

The summary table below identifies the sectors within the Millvale Borough Climate Action Plan, the number of actions within each sector, and the contribution of each sector toward the GHG reduction goal. Each sector has a dedicated section within this document where objectives and specific actions (both new and those already employed) are described.

While the local government cannot address climate change by itself, government policies and practices can dramatically reduce greenhouse gas emissions from a range of sources and help prepare Millvale Borough for

the anticipated impacts of climate change. In addition, the Millvale Borough will assist residents and businesses in their endeavors to reduce emissions through programs explained in this Plan. By working together, Millvale Borough can not only do its part toward achieving a stable climate - we can reap the benefits of healthier air, lower costs for utilities and services, improved transportation and accessibility, a more vibrant local economy, and many other positive side effects of reducing our carbon footprint.

Millvale Borough Climate Action Plan Summary Table – Sectors

Sector	Description	Number of Distinct Actions	Anticipated MTCO2e Reduction by XXXX	Percentage of Total Reduction at XXXX
Commercial & Industrial Buildings	Policies and programs to reduce commercial, municipal, and industrial sector energy use.	9	~14,900	22%
Residential Buildings	Policies and programs to reduce residential sector energy use.	6	~12,900	19%
Energy Production	Policies and programs to promote local small-scale renewables.	7	~6,800	10%
Waste, Composting and Recycling	Policies and programs to reduce solid waste generation.	8	~10,200	15%
Water and Wastewater Management	Policies and programs to reduce water demands and corresponding wastewater treatment needs.	10	~8,100	12%
Transportation	Policies and programs to reduce on-road vehicle miles traveled and promote electric or low emission vehicles.	5	~7,450	11%
[Other Sector]	Table provided here as example – to be modified according to local plan/conditions.	4	~7,450	11%

*MTCO2e (Metric tons of CO₂ equivalent)

The Impact on Emissions

The figure below depicts historic GHG emissions, forecasted growth in emissions, and target emissions from 2000 to 2020. The color wedges represent the projected reductions in emissions based on state and local programs.

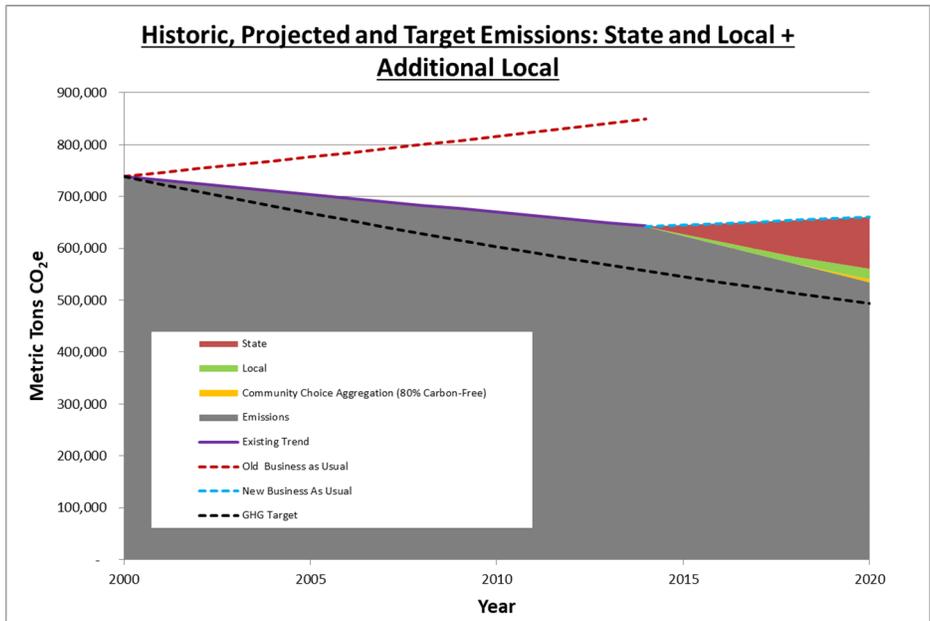


Figure 10: Visualizing GHG Reductions

3. Taking Action

In the following chapters, a series of objectives with supporting actions are explored for each emissions sector. An “Objective” is a goal, end result, or target, and an “Action” is a means of realizing the objective. Each sector draws on the actions of the local government, residents, and businesses, although some areas may be largely one or the other.

Emissions Reduction Potential

Calculating expected emissions reductions for each objective and action requires making assumptions about degree of implementation, technology, and individual behavioral changes several years into the future. The uncertainty associated with these assumptions makes it difficult to assign exact reduction totals to each objective or action. To address this uncertainty and provide a simple but useful reference for reduction potential, a series of symbols and percentage ranges has been devised to represent the emission reductions associated with each objective and its actions:

Symbol	GHG Reduction
	[Small Impact Range]
	[Moderate Impact Range]
	[Significant Impact Range]

Specific implementation assumptions and GHG reduction estimates are listed in the Appendix.

Evaluating Co-Benefits

In addition to measuring the GHG reduction potential, each objective and action is also evaluated for other benefits such as public health, equity and justice, jobs and prosperity, and environmental conservation. The symbols below will indicate which co-benefits a measure will generate.

Symbol	Co-Benefit
	Supports jobs and economic prosperity
	Advances social equity



Fosters resource security



Improves public health and local environmental quality

Supporting Actions

Certain actions might be supportive of more than one objective within the same or another sector. These cross-cutting actions will be indicated in the “Supporting Actions” column for each objective.

New and Existing Actions

This Climate Action Plan includes a combination of existing policies and programs as well as new ideas based on best practices from around the country. Whether an action is new or existing is noted in the action heading.

Consistency with Statewide Climate Action Plan

The Commonwealth of Pennsylvania’s 2018 Climate Action Plan includes many actions that are meant to be implemented by local governments as well as on the state-level. This Climate Action Plan incorporates as many of those actions as possible and appropriate. The tables in the following chapters will indicate whether an action is adapted from the statewide plan.

Climate Adaptation

Some of the proposed actions reduce risk to climate hazards as well as greenhouse gas emissions, which is explicitly identified in the “Reduces Climate Risks” column. This Plan does not propose any actions that would foreseeably increase the community’s risk to climate hazards, but some actions are more directly supportive of climate adaptation than others. The “Climate Adaptation” chapter describes climate hazards and related actions in more detail.

4. Commercial Energy

Energy consumed in commercial buildings and industrial processes account for 13% of Millvale Borough’s total GHG emissions. Improving the efficiency of our commercial building stock and reducing the energy intensity of the local industrial sector will contribute significantly to achieving Millvale Borough’s greenhouse gas reduction target. This chapter focuses on opportunities to retrofit existing commercial and industrial buildings and to ensure that future activities in these sectors are compatible with our community’s climate protection goals.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Co-Benefits	Reduction Potential
CB 1 – Retrofit existing commercial and industrial buildings to achieve a [XX]% reduction in energy use by [Year]	RB 1, EP 1		
CB 2 – Ensure new commercial and industrial construction is built to maximize energy efficiency	CB 1, RB 2		
[Other Objective]	[X]		
[Other Objective]	[X]		
[Other Objective]	[X]		

Objective CB1 – Existing Commercial and Industrial Buildings

Retrofit existing commercial and industrial buildings to achieve a [XX]% reduction in energy use by [Year]



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
CB-1A EXAMPLE	Partner with local utility companies to ensure commercial properties maximize use of energy efficiency rebate programs	N	Y			Community and Buildings Dept	Number of partnerships
CB- 1B EXAMPLE	Require benchmarking and disclosure of energy use in commercial and industrial buildings over [XX] square feet	N	Y			Utility, Bldgs & Finance Dept	Number of buildings using benchmarking
CB-1C EXAMPLE	Establish PACE program and/or partner with utilities to offer on-bill financing for commercial energy efficiency retrofit projects	N	N			Utility, Bldgs & Finance Dept	Number of PACE projects

5. Residential Energy

Energy consumed in residential buildings accounts for 89% of Millvale Borough’s total GHG emissions. Improving the efficiency of our residential building stock will contribute significantly to achieving Millvale Borough’s greenhouse gas reduction target, while saving residents money on utility bills and reducing the need for new infrastructure. This chapter focuses on opportunities to retrofit existing residential buildings, increase the quality of new construction, and to ensure that future activities in these sectors are compatible with our community’s climate protection goals.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Benefits	Reduction Potential
RB 1 – Retrofit existing residential buildings and homes to achieve a [XX]% reduction in energy use by [Year]	☒		
RB 2 – Ensure new residential buildings and homes are built to maximize energy efficiency	☒		
[Other Objective]	☒		
[Other Objective]	☒		
[Other Objective]	☒		

Objective RB 1 – Existing Residential Buildings

Retrofit existing residential buildings and homes to achieve a [XX]% reduction in energy use by [Year]



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
RB-1A	Double the number of homes weatherized through existing programs per year	E	N	Y		Community and Buildings Dept	Number of homes weatherized
RB- 1B	Offer financing vehicle to residential sector for energy retrofits	N	N	Y		Utility, Bldgs & Finance Dept	Financing program finalized
RB-1C	Increase residential uptake of utility incentives for energy efficiency	N	N	Y		Utility, Bldgs & Finance Dept	Number of residents participating

Objective RB 2 – New Residential Buildings

Ensure new residential buildings and homes are built to maximize energy efficiency



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
RB-2A	Improve building codes to exceed minimum efficiency requirements by XX%	N	Y	Y		Community and Buildings Dept	Number of homes weatherized
RB- 2B	[strategy description]	-	-	-		Utility, Bldgs & Finance Dept	Financing program finalized
RB-2C	[strategy description]	-	-	-		Utility, Bldgs & Finance Dept	Number of residents participating

6. Industrial Energy

Broadly speaking, the use of fossil fuels for energy (including electricity, heating, transportation, and other uses) is the single largest contributor to greenhouse gas emissions and climate change. Fossil fuels still supply a considerable share of energy for electricity, heating, transportation, and other energy-producing uses. Emissions from fossil fuel combustion for energy, including transportation, represent 45% of the community’s total GHG emissions. Energy Production is a cross-cutting sector in that nearly all activities that take place in the community require energy of some sort. While Duquesne Light is working hard to increase the percentage of electricity generated through renewable sources, opportunities also exist for citizens and Millvale Borough’s local government to produce small-scale renewable energy or fuels, offsetting the need for fossil fuels. This sector is limited to energy production exclusively – objectives and actions that focus on end use energy efficiency are included in other sectors. The programs and projects within this sector are designed to spur local government and community investment in renewable energy sources including those that produce electricity, heat, and mobile fuels.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Benefits	Reduction Potential
EP 1 – Enhance support to residents for installing small-scale renewable energy systems	CB 1, RB 1		
EP 2 – Supply [XX]% of [Jurisdiction] local government electricity demand via local renewable generation	CB 1		
EP 3 – Promote local production of biofuels and harness waste energy	WR 1, WW1		
[Other Objective]	[X]		
[Other Objective]	[X]		

Objective EP 1 – Small-Scale Renewable Energy Systems

Enhance support to residents for installing small-scale renewable energy systems



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
EP-1A EXAMPLE	Encourage community partners to finance and install renewable systems on large-scale private facilities	N	Y	N/A		Community, Economic Dev Committee	Number of partnerships
EP- 1B EXAMPLE	Establish a program to offer renewable energy system financing to small commercial properties	N	Y	N/A		Community, Local Bank, Bldgs, Finance, Legal Depts, Utility Experts	Program establishment
EP-1C EXAMPLE	[strategy description]	-	-	-		-	-

Objective EP 2 – Local Renewable Generation for Millvale Borough

Supply [XX]% of [Jurisdiction] local government electricity demand via local renewable generation



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
EP-2A EXAMPLE	Install renewable energy systems on [City/County]-owned facilities such that [20]% of total energy demand of local government buildings is met.	N	Y	N/A		PW Dept	Number of RE systems installed; percentage of energy demand met
EP- 2B EXAMPLE	Execute renewable power purchase agreement with [Utility] for 30% of total electricity demand of local government buildings	N	Y	N/A		PW Dept, Utility	Establishment of RE power purchase

7. Solid Waste Management

Millvale Borough’s solid waste is disposed of, primarily, at Allied Waste Imperial Landfill, which is just south of the Pittsburgh International Airport and sits on around 340 acres. Emissions from decaying putrescible material directly contribute 2% of Millvale Borough’s total GHG emissions and contribute to emissions in the Transportation sector via hauling of waste to and from facilities. Additionally, embodied energy within the items that we throw away might be harnessed through reuse and recycling of materials. It is in Millvale Borough’s long-term interest to reduce waste at its source, expand recycling facilities, reduce food waste, and enable re-use of materials. This chapter focuses on opportunities to reduce waste, reuse materials, and recycle what cannot be reused.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Benefits	Reduction Potential
WR 1 – Reduce solid waste generation by [XX]% by [Year]	CB 1, RB 1		
WR 2 – [objective description]	CB 1		
	WR 1, WW1		
	☒		
	☒		

Objective WR 1 – Reduce Solid Waste

Reduce solid waste generation by [XX]% by [Year]



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
WR-1A EXAMPLE	Establish “Building Materials Reuse Warehouse” for community construction and demolition use.	N	N	N/A		Solid Waste, PW, Bldg Depts	Establishment of warehouse
WR - 1B EXAMPLE	[Strategy description]	-	-	-		-	-
WR -1C EXAMPLE	[Strategy description]	-	-	-		-	-

8. Water & Wastewater Management

This sector does not include the methane collection system; please refer to Energy Production sector for this project.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Benefits	Reduction Potential
WW1 – Upgrade the energy efficiency of water delivery and treatment systems by 15%	CB1, RB 1		
WW 2 - [objective description]	CB1		
	WR 1, WW1		
	☒		
	☒		

Objective WW1 – Energy Efficiency

Upgrade the energy efficiency of water delivery and treatment systems by 15% by 2035



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
WW -1A EXAMPLE	Upgrade the mechanical and electrical systems at [Water or Wastewater Facility]	N	Y	Y		Co-owners, PW Dept	Number of systems upgraded
WW- 1B EXAMPLE	Participate in [Utility] energy efficiency incentive programs to upgrade pump efficiency	N	N	Y		PW Dept	Program participation
WW -1C EXAMPLE	[Strategy description]	-	-	-		-	-

9. Transportation

Emissions from transportation is a common sight to nearly everyone in Millvale Borough. Besides emitting greenhouse gases, transportation fossil fuels also produce a host of criteria air pollutants when combusted, reducing local air quality and affecting our health. Transportation accounts for 74% of Millvale Borough’s total GHG emissions. This chapter focuses on programs and policies to reduce emissions from transportation and includes design-oriented approaches as well as expansion of alternate modes such as walking, biking, or public transportation to and from the most common destinations in Millvale Borough.

The following tables contain sample objectives and actions. Please update the text and symbols accordingly.

Objective	Supporting Actions	Benefits	Reduction Potential
TR 1 – Reduce vehicle miles traveled by single-occupancy vehicles by XX% by XXXX	CB1, RB 1		
TR 2 – Electrify all municipal fleet and buses by 2050	CB1		
TR 3 – Build electric vehicle accommodations into development requirements	WR 1, WW1		
TR 4 –	⊠		
	⊠		

Objective TR 1 – Reduce single-occupancy vehicles

Reduce vehicle miles traveled by single-occupancy vehicles by 50% by 2035



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
TR-1A EXAMPLE	Expand existing XX bus route to XX street and add XX more stops	-	-	-		-	-
TR- 1B EXAMPLE	Incorporate designated carpool parking requirements into the development code	-	-	-		-	-
TR-1C EXAMPLE	Convert major corridors, including XX street, into complete streets	-	-	-		-	-

Climate Adaptation

This section provides a high-level assessment of potential climate impacts and highlights those greenhouse gas reduction actions that support adaptation for each type of hazard. While the Millvale Borough does not currently have the capacity to complete a more robust climate vulnerability assessment and adaptation action, the following analysis was completed to educate the public on local impacts and inform future efforts.

Anticipated Climate Impacts

Over the last 110 years, the Commonwealth of Pennsylvania has experienced a long-term warming of more than 1.8°F, as well as an increasing number of wet months. The warming and wetting trend is expected to continue at an accelerated rate, especially if the world continues on its current path of greenhouse gas emissions. Under this scenario, Pennsylvania will be about 5.4°F warmer than it was at the end of the 20th century, and the annual precipitation will increase about 8%. While the likelihood of meteorological drought is projected to decrease, months with above-average precipitation will continue to rise. These changes will have a variety of ecological, economic, and social impacts on the Commonwealth, particularly related to agriculture, energy, forests, human health, outdoor recreation, water, wetlands and aquatic ecosystems, and coastal resources (Shortle et al. 2015).

Millvale Borough is likely to experience pollution, floods, landslides, and water quality impacts due to climate change. For Millvale Borough's hazard/vulnerability assessment the U.S. Climate Explorer was used to determine specific projections for temperature and precipitation. From these graphs we can estimate what the max temperature and total precipitation will be depending on Millvale Borough's future GHG emissions. If Millvale Borough continues business-as-usual (BAU) max temperatures and extreme precipitation events/drought will likely increase.

The Millvale Borough used the U.S. Climate Explorer to identify likely changes from today through 2050. The following sections discuss the top climate hazards according to those projections. For more information about the science behind climate change, see Appendix II: Climate Change Science.

Rising Temperatures & Heat

The following graph (Figure 5) indicates that average daily temperatures have been increasing and will continue to rise through 2050, which could impact agriculture, public health, and other sectors of the community. The second graph (Figure 6) indicates that total precipitation through 2050, which will fluctuate depending on the severity of climate change impacts that include flooding, extreme weather events, and drought.

These graphs are from the U.S. Climate Explorer.

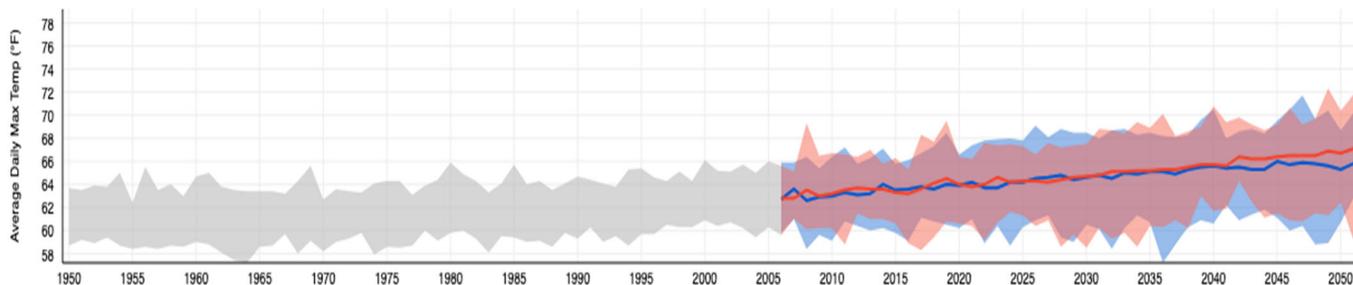


Figure 5: Average Daily Max Temperature Between 1950–2050

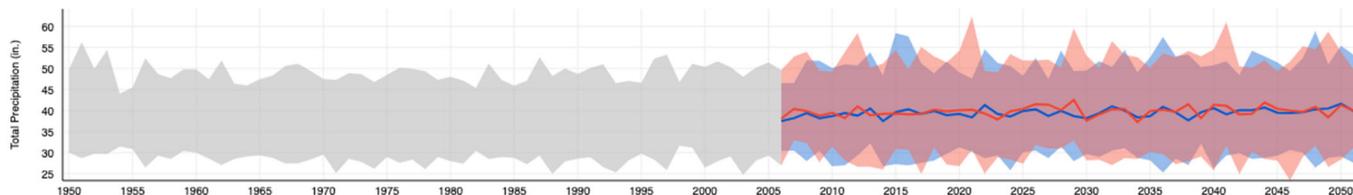


Figure 6: Total Precipitation Between 1950–2050

Adaptive Greenhouse Gas Reduction Measures

Some greenhouse gas reduction measures also reduce risk to climate hazards. The following are a few of many examples of how these outcomes can be related to one another:

- Actions that improve energy efficiency and distribute renewable energy can (1) reduce pressure on the grid when there is higher energy demand for heating and air conditioning during extreme heat events, and (2) increase energy independence for households and businesses, as opposed to complete reliance on centralized power infrastructure that could fail during a catastrophic event.

These types of actions include, but are not limited to:

- Energy-efficient building design for new construction, and retrofits for existing buildings (e.g. weatherization)
- Smart grid technologies
- Solar Installations

- Street lights to LEDs
- Replacing doors and windows
- Actions that reduce impervious surfaces can reduce the potential for flooding by retaining stormwater in place. These types of actions include, but are not limited to:
 - Expanding or restoring green space
 - Installing green roofs, rain gardens, bioswales, pervious pavers, and other green infrastructure (as well as requiring them for future development)
- Installing green roofs and planting trees adjacent to buildings can regulate indoor temperatures during extreme heat events
- Expanding and protecting alternative transportation routes (bicycle, pedestrian, bus, and rail) provides network redundancies and alternative routes for emergency evacuation
- Water efficiency and conservation actions can (1) reduce pressure on the grid from energy used for pumping, treating, and distributing water, and (2) make the community less vulnerable to drought

The following table identifies specific greenhouse gas reduction actions from the previous chapters that have the potential to reduce risk from climate hazards, and which hazards they address.

Action	Extreme Temperatures	Flooding	Drought	Seasonal Variations	[Other Hazard]
Solar Installations	X		X		
Green Infrastructure	X		X	X	
Improve Building Efficiency	X		X	X	
Install LED Street Lights				X	X
Expand/Restore Green Space	X	X	X	X	
Water Efficiency	X	X	X	X	X
Expand Bike Routes				X	X
Improve Sidewalks		X		X	
Expand Bus Routes	X			X	X

10. Monitoring Plan

Establishing a monitoring process enables Millvale Borough to track the impacts of the actions included in the plan and compare estimated impacts to what is actually achieved in terms of energy savings, renewable energy production, and GHG emissions reduction. Assessing the implementation status of the actions will allow determination of whether the action is performing well and to identify corrective measures. This process is also an opportunity to understand barriers to implementation and identify best practices or new opportunities in moving forward.

The table below describes the components of the monitoring reports. Action reports are to occur every two years and will only include status updates on the overall action, the mitigation action plan, and the adaptation action plan. The full monitoring report will occur every 5 years and in addition to the components in the action report, will include an updated community and municipal GHG inventory. This will help Millvale Borough track its GHG emissions reduction progress. With the approval of this Climate Action Plan in 2021, the first monitoring action report will be due in 2026 and the first full monitoring report with the updated GHG inventories will be due in 2025. Ideally, the most recent GHG inventories should be no more than four years old.

Monitoring Report Component	Action Reporting	Full Reporting
Overall Action: Reporting any changes to initial action as well as updated information on human and financial resources	Yes	Yes
GHG Emissions Inventories: Provide updated energy consumption and GHG emissions data for the reporting year	No	Yes
Climate Action Measures: Report the implementation status (completed, in progress, on hold) of key actions and update their impacts	Yes	Yes

Input needed from local government/task force.

11. References

- Allegheny Land Trust (ALT). (2020). Girty's Woods. Retrieved April 10, 2020, from <https://alleghenylandtrust.org/girtyswoods/>
- EvolveEA. (2019). Millvale Ecodistrict Pivot Plan, Sustainable Communities Award Winner. Retrieved February 22, 2020, from <https://evolveea.com/pivot-millvale/>
- Intergovernmental Panel on Climate Change (IPCC). (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerabilities: Summary for Policymakers. New York, NY: Cambridge University Press.
- International Council for Local Environmental Initiatives (ICLEI). (2020). Community Scale: Forecasts. Retrieved April 12, 2020, from https://clearpath.icleiusa.org/community_scale/forecast_years/1810/categories/7/forecasts/5627/edit
- IPCC. (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the IPCC [Core Writing Team, R.K. Pachauri, and L.A. Meyer (eds.)]. Geneva, Switzerland.
- IPCC. (2014). Summary for Policymakers. In: Climate Change 2014: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Av. Cambridge, U.K. and New York, NY, USA.: Cambridge University Press.
- New Sun Rising. (2020). How We Work. Retrieved February 15, 2020, from <https://www.newsunrising.org/how-we-work/overview/>
- Pennsylvania Department of Environmental Protection (PADEP). (2018). PA Climate Action Plan. Retrieved April 12, 2020, from <https://www.dep.pa.gov/Citizens/climate/Pages/PA-Climate-Action-Plan.aspx>
- Pennsylvania Department of Environmental Protection (PA DEP). (2019). Climate Change. Retrieved from Pennsylvania Department of Environmental Protection: <https://www.dep.pa.gov/citizens/climate/Pages/default.aspx>
- Pennsylvania Department of Environmental Protection (PA DEP). (2019). Pennsylvania Greenhouse Gas Inventory. Retrieved from <https://www.dep.pa.gov/citizens/climate/Pages/GHG-Inventory.aspx>

Shortle, James, David Ablner, Seth Blumsack, Aliana Britson, Kuai Fang, Armen Kemanian, Paul Knight, Marc McDill, Raymond Najjar, Michael Nassry, Richard Ready, Andrew Ross, Matthew Rydzik, Chaopeng Shen, Shilong Wang, Denice Wardrop, Susan Yetter. 2015. Pennsylvania Climate Impacts Assessment Update. Pennsylvania State University. Retrieved from Pennsylvania Department of Environmental Protection:

<http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5002&DocName=2015%20PENNSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%20UPDATE.PDF%20>

Appendix I: Methodology

This appendix details calculation methods and other technical information gathered and used throughout the report. The GHG inventory may be included here or referenced if there is already separate documentation.

Appendix II: Climate Change Science

For some communities, this section might be unnecessary. An alternative is to simply provide links to scientific articles here for those who would like more information. You could also use information from the National Climate Assessment report, which is just focused on the United States: <https://nca2018.globalchange.gov/>

If your community would like to add more details about local/regional climate change projections than what is provided in the Climate Adaptation chapter, feel free to add to the text below as necessary.

Note: When IPCC's 6th report is released in 2021, information and references need to be updated.

The Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report affirms that “warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level” (IPCC, 2014, p. 151). Researchers have made progress in their understanding of how the Earth's climate is changing in space and time through improvements and extensions of numerous datasets and data analyses, broader geographical coverage, better understanding of uncertainties and a wider variety of measurements (IPCC, 2014). These refinements expand upon the findings of previous IPCC Assessments – today, observational evidence from all continents and most oceans shows that “regional changes in temperature have had discernible impacts on physical and biological systems” (IPCC, 2014, p. 151).

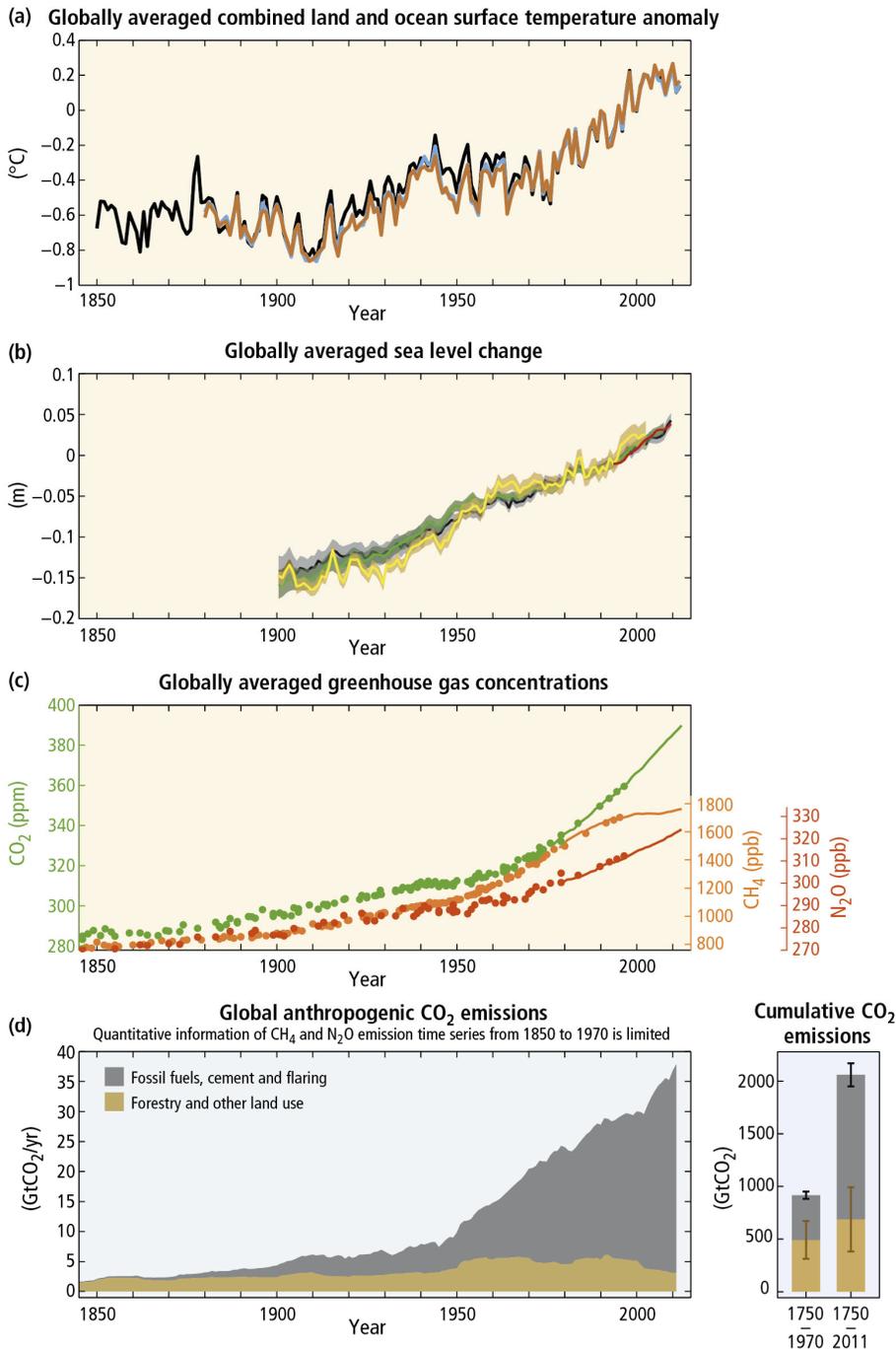


Figure 1 Observations and other indicators of a changing global climate system

The Fifth Assessment also asserts that “it is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing’s together. Globally, economic and population growth continued to be the most important drivers of increases in CO₂ emissions from fossil fuel combustion. Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm

temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions” (IPCC, 2014, p. 151).

In short, the Earth is already responding to climate change drivers introduced by mankind.

Temperatures and Extreme Events are Increasing Globally

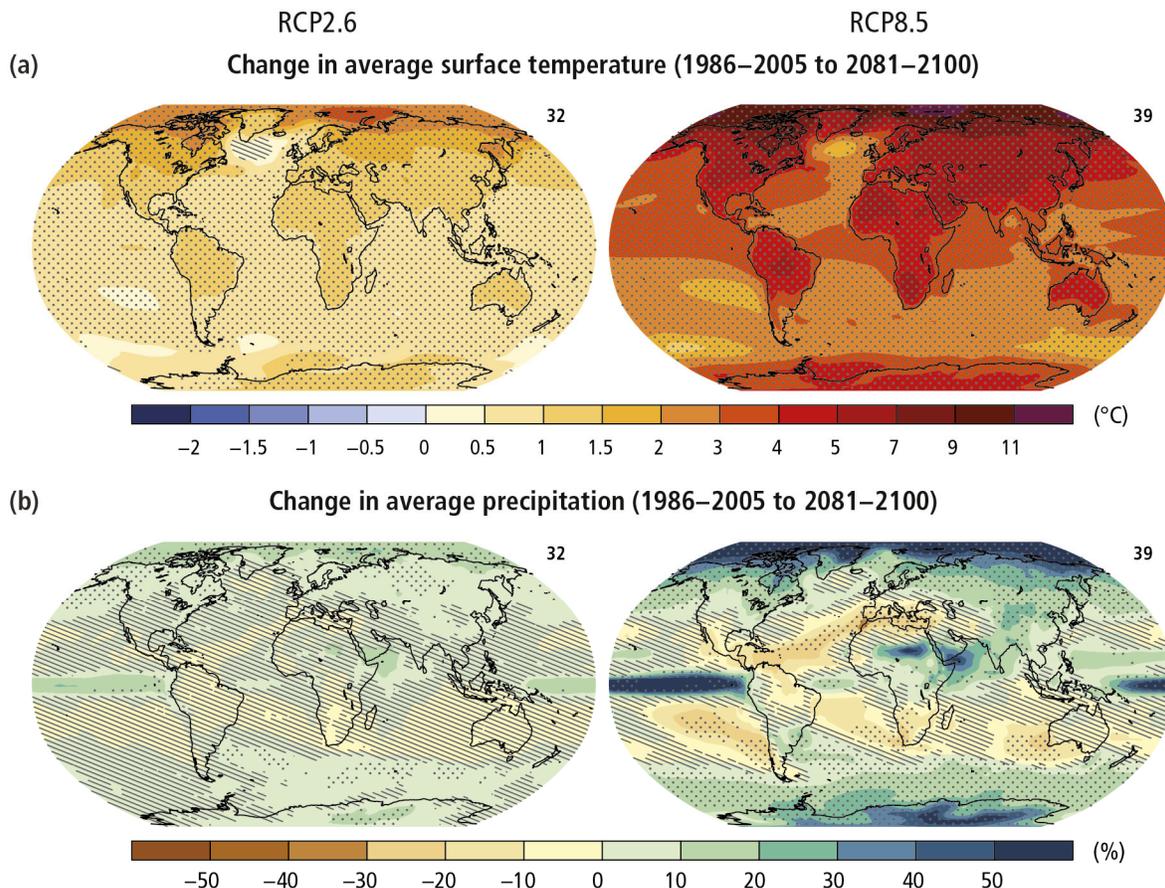


Figure 2 Change in average surface temperature (a) and change in average precipitation (b) based on multi-model mean projections for 2081–2100 relative to 1986–2005 under the RCP2.6 (left) and RCP8.5 (right) scenarios.

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level to rise. Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions (IPCC, 2014).

Climate Risks

Climate change is projected to undermine food security. Due to projected climate change by the mid-21st century and beyond, global marine species redistribution and marine biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and other ecosystem services. For wheat, rice and maize in tropical and temperate regions, climate change without adaptation is projected to negatively impact production for local temperature increases of 2°C or more above late 20th century levels, although individual locations may benefit. Global temperature increases of ~4°C or more above late 20th century levels, combined with increasing food demand, would pose large risks to food security globally. Climate change is projected to reduce renewable surface water and groundwater resources in most dry subtropical region, intensifying competition for water among sectors.

Until mid-century, projected climate change will impact human health mainly by exacerbating health problems that already exist. Throughout the 21st century, climate change is expected to lead to increases in ill-health in many regions and especially in developing countries with low income, as compared to a baseline without climate change. Health impacts include greater likelihood of injury and death due to more intense heat waves and fires, increased risks from foodborne and waterborne diseases and loss of work capacity and reduced labor productivity in vulnerable populations. Risks of undernutrition in poor regions will increase. Risks from vector-borne diseases are projected to generally increase with warming, due to the extension of the infection area and season, despite reductions in some areas that become too hot for disease vectors.

In urban areas climate change is projected to increase risks for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges. These risks are amplified for those lacking essential infrastructure and services or living in exposed areas. Rural areas are expected to experience major impacts on water availability and supply, food security, infrastructure and agricultural incomes, including shifts in the production areas of food and non-food crops around the world.

Climate change is projected to increase displacement of people. Populations that lack the resources for planned migration experience higher exposure to extreme weather events, particularly in developing countries with low income. Climate change can indirectly increase risks of violent conflicts by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (IPCC, 2014).

Greenhouse Gas Emissions Must be Reduced

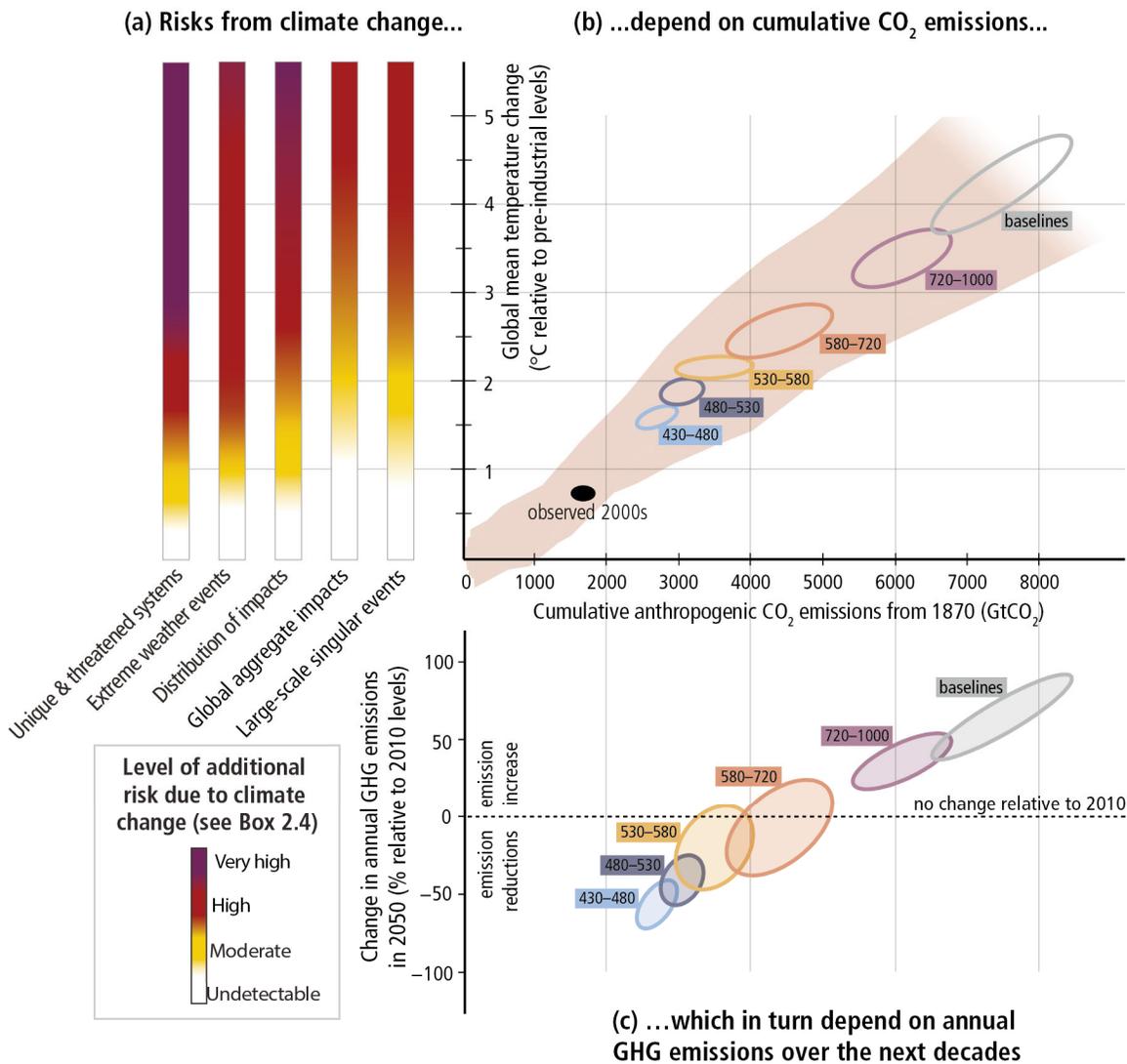


Figure 3 The relationship between risks from climate change, temperature change, cumulative carbon dioxide (CO₂) emissions and changes in annual greenhouse gas (GHG) emissions by 2050.

Limiting risks across Reasons For Concern (a) would imply a limit for cumulative emissions of CO₂ (b) which would constrain annual GHG emissions over the next few decades (c). Panel A reproduces the five Reasons For Concern. Panel b links temperature changes to cumulative CO₂ emissions (in GtCO₂) from 1870. They are based on Coupled Model Intercomparison Project Phase 5 simulations (pink plume) and on a simple climate model (median climate response in 2100), for the baselines and five mitigation scenario categories (six ellipses). Panel C shows the relationship between the cumulative CO₂ emissions (in GtCO₂) of the scenario categories and their associated change in annual GHG emissions by 2050, expressed in percentage change (in

percent GtCO₂-eq per year) relative to 2010. The ellipses correspond to the same scenario categories as in Panel B, and are built with a similar method (IPCC, 2014).

The recent and massive buildup of greenhouse gases in our atmosphere is conceivably even more extraordinary than changes observed thus far regarding temperature, sea level, and snow cover in the Northern hemisphere in that current levels greatly exceed recorded precedent going back much further than the modern temperature record.

Anthropogenic greenhouse gas emissions have increased since the pre-industrial era driven largely by economic and population growth. From 2000 to 2010 emissions were the highest in history. Historical emissions have driven atmospheric concentrations of carbon dioxide, methane and nitrous oxide to levels that are unprecedented in at least the last 800,000 years, leading to an uptake of energy by the climate system (IPCC, 2014).

In response to the problem of climate change, many communities in the United States are taking responsibility for addressing emissions at the local level. Since many of the major sources of greenhouse gas emissions are directly or indirectly controlled through local policies, local governments have a strong role to play in reducing greenhouse gas emissions within their boundaries. Through proactive measures around land use patterns, transportation demand management, energy efficiency, green building, and waste diversion, local governments can dramatically reduce emissions in their communities. In addition, local governments are primarily responsible for the provision of emergency services and the mitigation of natural disaster impacts. While this Plan is designed to reduce overall emissions levels, as the effects of climate change become more common and severe, local government adaptation policies will be fundamental in preserving the welfare of residents and businesses.

Suggestions for uncompleted sections:

Planning Team and Stakeholders:

List the primary stakeholders that will be part of the implementation of this CAP for Millvale Borough.

Community Driven Planning Process:

In this section explain the virtual community workshop we were planning to create for Facebook live. I can continue to help build a PowerPoint presentation for this workshop on the information/data we have collected so far. Explain the planning process of the community workshop, how we are going to implement equity to all populations within Millvale, what engagement activities/implications will we include in this workshop, and which specific populations should be included in this workshop.

Mitigation Objectives:

Focus on mitigation/adaption strategies that will help us reach our GHG reduction goals for the years 2025, 2040, and 2050. These should be aligned with the reduction % for each of these years and follow the PA CAP reduction targets.

Saving Money and Reducing Risk:

Include some budget information in this section, particularly how much the local government spent on energy to power buildings and fuel its vehicle fleet. Then explain the expected monetary cost/benefit of Climate Action Plan projects within Millvale Borough.

Millvale Borough's Community-Wide GHG Emissions and Millvale Borough's GHG Reduction Target:

For these sections most of the information will be entered into ClearPath and then graphed for visual representation. Some of these sections are partly completed, but to complete them I would have a one-on-one meeting between one of the ICLEI representatives (Jesse Carpentier/Calyn Hart) and the task force. This information can be found in the PA CAP Cohort Session 10: Next Steps for Local Government.

Millvale Borough Climate Action Plan:

In this section we need to focus on which actions will be taken within each energy sector to help reduce GHG emissions and meet our reduction goals. Focus on which mitigation/adaption strategies will be used for each energy sector, how many actions will be used, how much anticipated MTCO₂e reduction by 2050, and percentage of total reduction at 2050.

Emission Reduction Potential:

I would consider using the symbols provided in this section because they are easy to understand, especially for people without a scientific background.

Statewide CAP Consistency:

We never went over the similarities between the Millvale CAP and PA CAP, but in this section it includes all the PA CAP objectives and actions. Keep any objectives/actions Millvale plans to incorporate in this CAP and delete the others. This section shows how aligned the two CAPs will be.

Climate Equity:

Most of this section will fall under the community driven planning process. I would just go into more detail about how this CAP will benefit all populations/residents of Millvale Borough. Then provide which objectives/actions will be implemented that will create equity within the community.

Commercial Energy, Industrial Energy, Residential Energy, Solid Waste Management, Water/Wastewater Management, and Transportation:

In our task force meetings, we never got into detail about specific objectives/actions that will be taken in each energy sector. I would first focus on specific actions/objective that will benefit Millvale Borough and the Community and then include ones from the PA CAP that can be implemented as well. These can be new/existing actions but should benefit aspects of community and have reduction potential. These sections will help with the planning and monitoring modules within ICLEI's ClearPath to help provide graphs and other visual data.

Monitoring Plan:

This section provides details on how the local government will implement and monitor the process of this CAP and how Millvale Borough is staying on target to reach its GHG emission reduction goals. Since Millvale already has a significant head start with the implementation of the Ecodistrict Pivot Plans include some information about that too.

Appendix I and II:

For Appendix I provide any calculation methods and other technical information gathered and used throughout the report. For Appendix II it is up to the task force if they want to have this section within the report.