

City of Easton Climate Action Plan



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City of
EASTON
PENNSYLVANIA

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Produced by Nurture Nature Center



Credits and Acknowledgments

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- Nurture Nature Center

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Background

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 the City of Easton are no exception. The City of Easton 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 City of Easton'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 City of Easton'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 City of Easton's future resilience and will hopefully be a catalyst for developing a robust strategy towards that end.

The City of Easton joined the Global Covenant of Mayors for Climate and Energy in 2016 and completed a greenhouse gas inventory in 2016, 2017, and 2018. A climate vulnerability assessment and an emissions reduction target were developed in spring of 2018. The climate vulnerability assessment was completed by Nurture Nature Center and Lafayette College students in a Sustainable Solutions class led by Dr. Julia Nicodemus and Dr. Ben Cohen, including Emma Fortier, Aaron Gabay, Daniel Gonzalez, Kameron Hardy, Christian Lee, Nicolette Lupo, Austin McKee, Kendall Sangster, Anthony Thompson, and Andrew Winn.

The emissions reduction target adopted by City Council in 2018 was 80% reduction of 2016 baseline emissions by 2050 with 30% reduction of 2016 baseline emissions by 2030. Now, this is the last step in the Global Covenant process – developing a climate action plan designed to reach an emission reduction target with an updated 2018 emission baseline. In fall 2020, Nurture Nature Center, on behalf of the City of Easton, participated in the PA DEP Local Climate Action Program to complete this report. This Climate Action Plan meets the reduction target outlined in the Commonwealth of Pennsylvania's 2018 Climate Action Plan and proposes a new reduction target that would exceed that target.

1. Introduction

Climate change is the greatest environmental challenge of the 21st century, with overwhelming evidence in the past decade. 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 gases (GHGs) 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 GHGs in the atmosphere leads to too much heat and solar 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.

It poses a serious threat not just to the City of Easton'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. The City of Easton 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 strain 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 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. Through proper planning, communities like the City of Easton 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, which 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 GHG 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, the City of Easton'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

The City of Easton is joining an increasing number of local governments committed to addressing climate change at the local level. The neighboring City of Bethlehem has completed their Climate Action Plan recently with an emissions reduction goal of net zero by 2040. The City of Easton is a signatory to the Global Covenant of Mayors for Climate & Energy, the largest global alliance for city climate leadership across the globe with more than 10,000 cities committed to tackling the climate crisis through local initiatives, innovative financing models, and sustainable infrastructure. The City of Easton signed on to this agreement in 2016, completed an initial greenhouse gas inventory in 2017, and adopted an initial emissions reduction target in 2018. The next step in the process is to develop a climate action plan to achieve that target based on an updated inventory for 2018. To accomplish this, the City of Easton is participating in Pennsylvania's Department of Environmental Protection's Local Climate Action Plan and working with a local college student to develop this plan under guidance from consultants with ICLEI – Local Governments for Sustainability, USA (ICLEI).

The City of Easton 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 the City of Easton needs to address existing climate risks such as flooding, heavy precipitation events, and extreme heat, 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 the City of Easton for years to come.

Purpose

By creating a clear course of action in which everyone has a role in setting and achieving climate and sustainability goals, our Climate Action Plan drives and coordinates local efforts toward a 30% reduction in GHG emissions by 2030 and an 80% reduction by 2050 compared to 2018 emissions levels. The plan also proposes the consideration, investigation, and adoption of a more ambitious target of a 60% reduction by 2030 and net zero by 2040.

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

In addition to addressing mitigation concerns, the Climate Action Plan considers the vulnerability of the City of Easton 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 City of Easton. It addresses the major sources of emissions in the City of Easton and sets forth objectives and actions in the following sectors:

- Municipal Operations
- Commercial Buildings
- Residential Buildings
- Energy Production
- Waste, Composting, and Recycling
- Water & Wastewater Management
- Transportation
- Urban Forest, Green Space, and Habitat
- Local Food & Agriculture
- Public Engagement & Education

The City of Easton, local utilities, business owners, community organizations, health and educational institutions, and community members can implement these actions together to reduce greenhouse gas emissions. 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 the City of Easton 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 City of Easton'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.

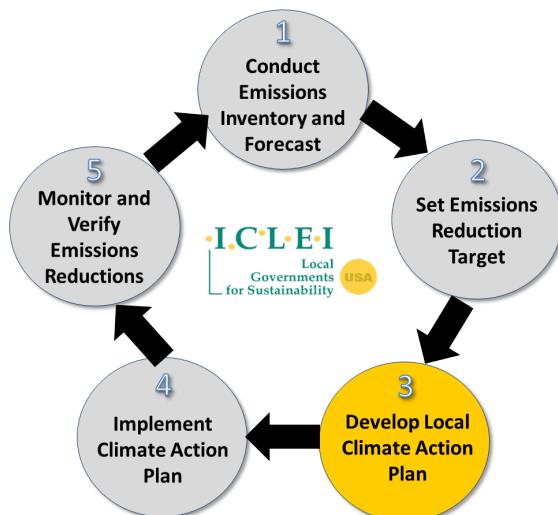


Figure 1: Five Milestones for Climate Mitigation

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 the City of Easton'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

Nurture Nature Center is the primary entity guiding the planning process. The NNC team led by Dr. Kathryn Semmens, Science Director, who along with Lauren Fosbenner, Project Assistant; Keri Maxfield, Art Director; and Rachel Hogan Carr, Executive Director, worked to design and implement community engagement activities as well as coordinate with the City of Easton and other members of the stakeholder working group. NNC worked with Sam Borick, undergraduate student at Muhlenberg University through the Pennsylvania Department of Environmental Protection's Local Climate Action Plan's program to complete an updated greenhouse gas inventory and climate action plan process in Fall 2020 through Spring 2021.

Specifically, in February 2021, NNC convened and surveyed a group of diverse stakeholders in the City and conducted one on one interviews with other community members. Those stakeholders include the following:

- Dave Hopkins, Director of Public Works Department, City of Easton
- Stephen Nowroski, Code Enforcement and Planning, City of Easton
- Carl Manges, Planning Administrator, City of Easton
- Charles Elliott, Easton Environmental Advisory Council
- Rob Christopher, City of Easton Forester
- Ross Marcus, Easton Area Neighborhood Center
- Alisa Baratta, Executive Director, 3rd St. Alliance
- Amy Boccadoro, West Ward Community Initiative
- Jim Toia, Director of Community Based Teaching, Lafayette College
- Monica Seligmann, Karl Stirner Arts Trail
- Janice Komisor, ProjeCt Easton
- Geoff Reese, Lehigh Valley Planning Commission
- Peter Crownfield, Sustainability Alliance
- Mark Reid, Urban Farm at the Easton Area Neighborhood Center
- Lisa Miskelly, Assistant Director of Food & Farm, Lafayette
- Miranda Wilcha, Community Garden, Greater Easton Development Partnership
- Allison Czapp, Buy Fresh Buy Local of the Greater Lehigh Valley
- Delicia Nahman, Sustainability Director, Lafayette College
- David Brandes, Professor, Lafayette College
- Jennifer Stocker Long, Executive Director, Easton Public Library
- Kim Kmetz, Greater Easton Development Partnership/Main Street Alliance
- Carey Birgel, Sigal Museum
- Claire Sadler, Delaware and Lehigh Heritage Corridor and Canal Museum
- Susan Worobec, Chair of Easton Area Chamber of Commerce (Unity Bank)
- Liana Marte, Director, Easton & Phillipsburg Area Initiatives, Greater Lehigh Valley Chamber of Commerce
- Laurie Nelson, Greater Lehigh Valley Chamber of Commerce

- Thomas Guth, Hazard Mitigation/Disaster Recovery Manager, Northampton County Emergency Management
- John Cosgrove, Easton Resident
- Lynn Alexander, Easton Resident
- Lillian Robinson, Easton Resident and member of NAACP

The Stakeholder group met virtually on February 4, 2021 to go over the Easton Climate Plan process and discuss community engagement. Participants also completed a survey about priorities, barriers, and strategies related to the CAP.

A public survey was collected during the first three weeks in March, which asked community members their concerns, priorities, and opinions on strategies related to the CAP. 150 responses were collected. A Spanish version was also available. The results of the survey informed the development of this CAP. In addition, NNC staff conducted eight one-on-one interviews with a number of community members, County administration, and a State representative.

A virtual public meeting was held on May 25th, which presented the proposed mitigation and adaptation strategies included in this report. 34 participants attended and a recording was made available to those not able to attend. A short survey to provide feedback on the strategies and objectives was made available after the meeting for two weeks. 12 respondents provided input included in this final draft plan. The plan was also discussed with and reviewed by the City of Easton's Environmental Advisory Council.

Social Equity

Globally, calls for climate equity have become an important part of climate planning, and climate equity was a core component of the local 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.

Communities of color and low-income populations have historically been underserved by programs and investments and under-represented in decision-making, including for the development and implementation of climate policy. These exclusionary processes can 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 anticipated to amplify the impacts of these existing inequities for residents of the most at-risk communities, including those from lower income neighborhoods, communities of color, immigrants, unhoused, outdoor workers, the very young, and the elderly. Proper planning will ensure that the many economic and health benefits of carbon reduction investments are shared equitably across the city.

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

Community-Driven Planning Process

The City of Easton is committed to equitable planning through a community-driven process. A diverse stakeholder group was formed with representatives from a range of constituent groups and organizations throughout the City, including residents as well as organizational leaders. The process sought to engage members from across the community, and included outreach to parents at Paxinosa Elementary School and

the distribution of Spanish-language materials. At the outset, the initial contact list for the stakeholder group identified additional names and contacts for inclusion, to ensure that as many perspectives as possible were brought into the planning process. Issues of equity are included in the City's overall Climate Action Plan vision and objectives and strategies are included that evaluate or consider how their impacts increase or decrease climate equity. Further, climate equity metrics are included in the recommended monitoring plan described later in chapter 16. While the community engagement process sought to reach underserved communities in a variety of ways, we recognize that this will be an ongoing process and there is a need to continue and deepen that engagement.

Vision Statements and Objectives

The City of Easton is committed to being a leader in taking action to address climate change through mitigation and adaptation actions.

1. Make the City of Easton a leader in climate actions, including sourcing clean and local energy that comes from the sun, wind, or other innovative renewable technologies.
2. Transform our buildings into energy efficient, sustainable 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 the City of Easton into a community where people walk, bike, take mass transit, or carpool for most trips in a safe, accessible, and affordable transportation network.
5. Become a leader in sustainable, smart transportation through innovative partnerships, policies, programs, and technology.
6. Understand potential climate-related risks and mitigate these risks while preparing our community for chronic and extreme weather events.

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 (with a potential to increase this goal to net zero). Each action and objective was 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 City of Easton 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 2030

- Easton will reduce energy use in its buildings by 20%
- 100% of Easton's electricity will come from renewable energy
- Electric Vehicles will be powered by 100% renewable energy
- Easton will incentivize Leadership in Energy & Environmental Design (LEED) certification or equivalent, and/or enforce net-zero building codes for new buildings
- At least 30% of new housing units (constructed after adoption of the plan) are within ¼ mile of high-frequency transit are designated affordable. High-frequency transit would be bus stops that are regularly serviced as well as the Easton Intermodal Transportation Center. Affordable refers to the HUD standard of 30% of income for housing costs.
- 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)

- Increase annual number of households reached by low-income weatherization or energy efficiency programs by 30%
- Decrease the energy costs of low-income residents by 20%
- Install roof-top solar on homes of 20% of low and moderate income residents

By 2050

- 70% of Easton's households and businesses will participate in smart grid meter programs
- 90% of Easton'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
- 100% of public transportation will be carbon free
- 80% of light-duty vehicles will be electric
- 100% of Easton's light- and heavy- duty vehicles will be electric or fueled by carbon-free fuel

2. 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 City of Easton’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. 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 of 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 outdoor recreation on the Delaware River.

3. Enhancing Resource Security

A key strategic co-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 the City of Easton’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 City of Easton, such service disruptions will become less likely, and the City of Easton 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 natural hazards such as flooding and extreme heat.

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 the City of Easton.

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, the City of Easton's community-driven planning process generated solutions that will both address climate change and improve quality of life for all residents including communities of color and low-income communities.

3. City of Easton'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.

Easton used the One Planet City Challenge (OPCC) SBT calculation method for completing the inventory. Through the completion of a greenhouse gas inventory, the City of Easton has determined emissions levels for the community as a whole. Community-wide emissions represent the sum total of emissions produced within the City of Easton 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.

City of Easton Community-Wide GHG Emissions

The following figure breaks down community-wide emissions in the City of Easton. Note that emissions from the City of Easton's operations are embedded within the community-wide totals. For example, emissions from government buildings are included in the "Commercial" sector and emissions from the City of Easton fleet vehicles are included in the "Transportation" sector. In addition, the City of Easton manages the jurisdiction's water supply and treatment and wastewater treatment centers which are accounted for in their own section.

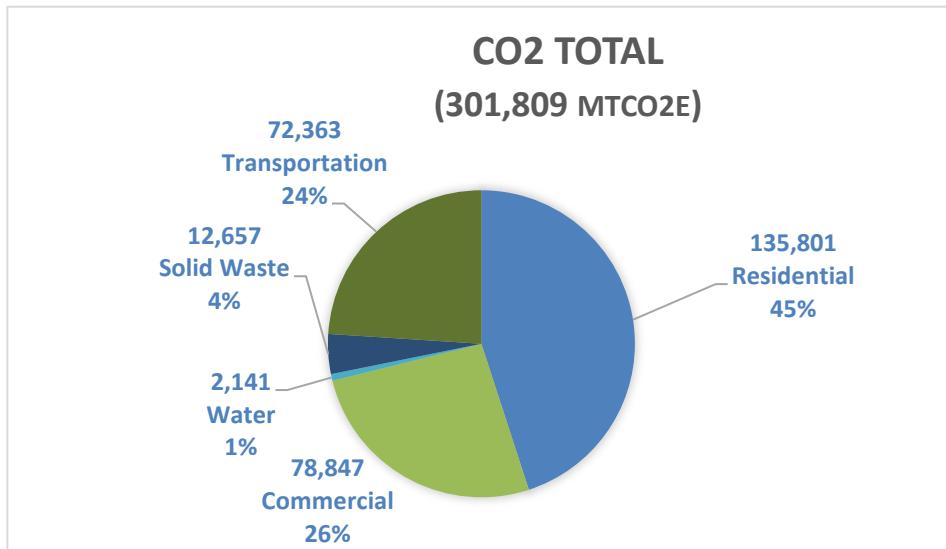


Figure 2: City of Easton Community-Wide GHG Emissions for 2018 in MTCO2e (Metric tons of CO2 equivalent)

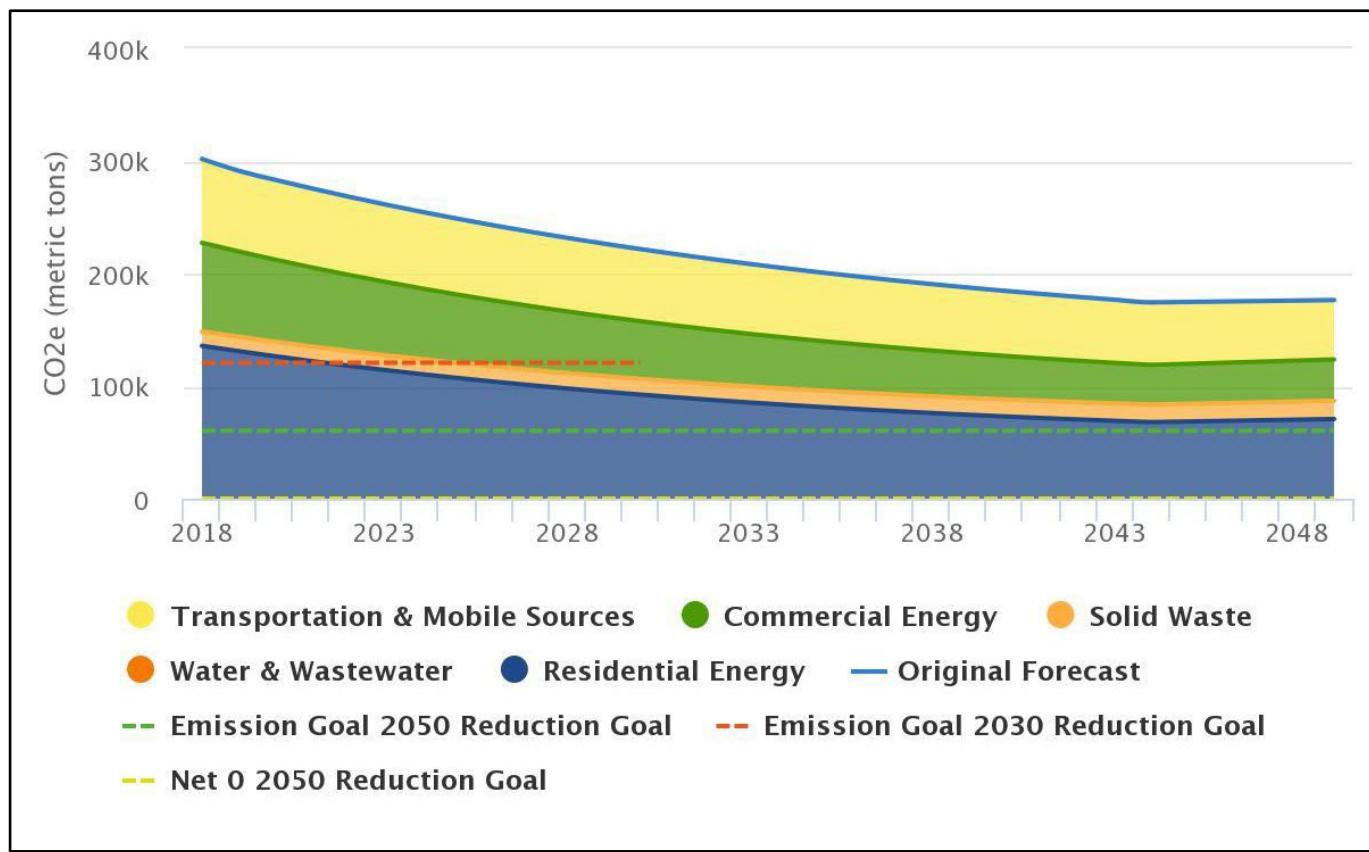
Forecasting the City of Easton's GHG Emissions

The City of Easton 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. Our “Business As Usual” forecast predicts that by the year 2050 the City of Easton would be responsible for 175,000 metric tons of CO₂e given no further local action. The small reductions in emissions are due to actions by the energy suppliers to the city, specifically because of First Energy’s carbon intensity reduction goals.

Projected Growth in GHG Emissions

Figure 3 depicts our “Business As Usual” emissions output produced using data from ClearPath. Clearpath is a calculator-based tool that follows the formulas and [where applicable] the default emissions factors described in the [U.S. Community Protocol](#).

Figure 3 shows the projected change in GHG emissions in the City of Easton from 301,810 to 176,425 metric tons of CO₂e. For complete information regarding the emissions inventory and forecast, including methodology and supporting data, please reference Appendix I.



City of Easton's GHG Reduction Target

The City of Easton has set targets to reduce its emissions to 80 percent below 2018 levels (301,809 MTCO₂e (Metric tons of CO₂ equivalent)) by 2050. This total does not include industrial sources. Industrial sources were excluded from this inventory and plan because it is outside Easton’s scope of influence and the City chose to focus its inventory and planning on the emissions sources over which there is more control. The

combination of measures that the City of Easton has already implemented, those that are currently planned, and new measures presented through this Climate Action Plan is designed to achieve the 2050 targets. Reductions by 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.

The City of Easton's reduction target is consistent with the statewide target of 26% reduction by 2025 and 80% by 2050 from 2005 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 Impact on Emissions

The figure below depicts historic GHG emissions, forecasted change in emissions, and the 2050 emissions target, in addition to showing the effects of our carbon reduction strategies. The white wedge between the blue line and our total emissions output represents the amount of GHGs reduced in our Climate Action Plan. This graph helps visualize the expected reduction in CO₂e in addition to depicting the changes in carbon contribution from each of our sectors. Based on these forecasts, reductions in Commercial, Residential and Transportation sectors are most central to achieving our goal of an 80% emissions reduction by 2050. To achieve net zero, additional strategies would need to be explored including the possible purchase of carbon credits. Net zero does not necessarily mean no emissions – rather that the combination of approaches balances emissions released with emissions removed from the atmosphere, which can be accomplished by taking up carbon through greening projects or through a carbon credit system.

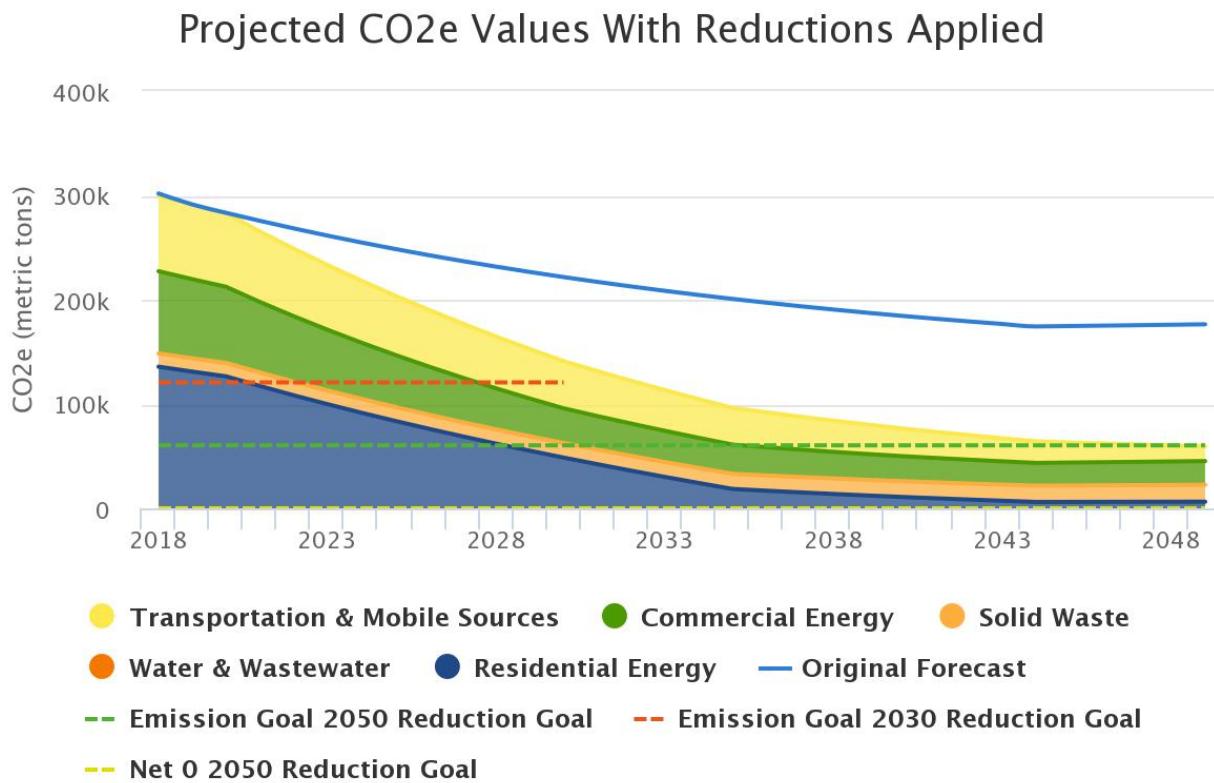


Figure 4: Visualizing GHG Reductions

4. 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 decades 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 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 at 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.

5. Municipal Operations

As noted above, the City of Easton is directly responsible for a subset of total community emissions resulting from government buildings, City of Easton fleet vehicles, and management of city-owned land. The actions listed in this section not only reduce the portion of community emissions attributable to city operations, but also present opportunities for the City of Easton to model best practices for cutting emissions and maximizing co-benefits and to “pilot test” strategies that may then be implemented by local businesses, institutions, and individual residents.

Objective	Supporting Actions	Co-Benefits	Reduction Potential
MO 1 – Continue to reduce emissions from municipal operations	EP 2, EP 3, WR 3, WW 2, TR 2	  	 
MO 2 – Implement Easton’s Climate Action Plan	EP 1, PE 1, PE 3	   	  

Objective M0 1 – Reduce municipal emissions

Continue to reduce emissions from municipal operations



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
M0-1A	Purchase 100% renewable energy for all municipal operations. Review energy sources for environmental justice concerns and whether they use high impact energy projects. Consider installing solar panels on municipal buildings.	N	Y		Dept. of Public Works	Municipal electricity source
M0-1B	Continue to invest in energy efficiency measures whenever possible, including LED lightbulbs, system upgrades, programmable thermostats, etc.	E	Y		Dept. of Public Works	Decrease in municipal electricity consumption
M0-1C*	Lead by example and require all city buildings to meet higher energy efficiency standards and consider LEED certification for those not certified.	N	Y		Dept. of Public Works	Percentage of city-owned buildings with energy efficiency better than mandated by code
M0-1D	Assess feasibility of converting city-owned vehicles to electric vehicles (EVs). Easton's parking enforcement fleet already includes EVs.	E	Y		Office of Sustainability/Multiple City Departments	Percentage of city fleet made up of EVs
M0-1E	Continue efforts to power the city's wastewater plant with captured methane from the treatment process.	E	Y		Easton Area Joint Sewer Authority	Percentage of plant energy demand met by cogeneration

* community priority expressed in survey or interview

Objective MO 2 – Implementation

Implement Easton's Climate Action Plan



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
MO-2A*	Create an Office of Sustainability and Director of Sustainability that would be able to oversee the programs described in this plan and coordinate efforts between city departments and external partners. Student internships can also help with implementation.	N	N		Mayor's Office/City Council	Creation of office
MO-2B	Update the city's GHG emissions inventory on an annual basis and continually assess progress toward CAP goals. Implement tracking of city energy usage via a regularly updated energy usage monitoring platform.	N	N		Office of Sustainability	GHG Reductions in alignment with CAP goals
MO-2C*	Integrate climate change considerations into all city planning and decision-making, including comprehensive plan, local hazard mitigation plan, stormwater management, zoning and land use decisions, etc. Ordinances should support net-zero buildings.	E	Y		Office of Sustainability, All City Departments	Consideration of climate change in all official plans.
MO-2D	Coordinate the efforts of key partners to implement each CAP strategy, including city departments, city council, individual Easton residents, the Environmental Advisory Council, municipal authorities, area health networks, local businesses, nonprofit organizations, schools, utilities, and other entities as appropriate	N	N		Office of Sustainability	Number of partners involved in programs related to CAP goals

* community priority expressed in survey or interview

6. Commercial Buildings

Energy consumed in commercial buildings account for 26% of the City of Easton's total GHG emissions. Improving the efficiency of our commercial building stock and reducing the energy demand will contribute significantly to achieving City of Easton's greenhouse gas reduction target. This chapter focuses on opportunities to retrofit existing commercial buildings and to ensure that future activities in these sectors are compatible with our community's climate protection goals.

Objective	Supporting Actions	Co-Benefits	Reduction Potential
CB 1 – Decrease emissions from existing commercial buildings	EP 1, EP 2, EP 3, UF 1	   	  
CB 2 – Ensure new commercial buildings are constructed to minimize emissions	EP 2, UF 1, UF 2	   	  

Objective CB1 – Existing Commercial Buildings

Decrease emissions from existing commercial buildings



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
CB-1A	Require benchmarking and disclosure of energy and water use in buildings. Utility data and EPA's ENERGY STAR Portfolio Manager can achieve this.	N	Y		Office of Sustainability	Number of buildings using benchmarking
CB-1B	Establish a building retrofit program to replace fossil fuel appliances and systems with high efficiency electric options such as Energy Star.	N	Y		Dept. of Community and Economic Development	Number of appliances/systems replaced
CB-1C	Promote the Pennsylvania C-PACE program and local utility rebate programs to commercial building owners to finance system retrofits and energy efficiency measures.	E	Y		Sustainable Energy Fund/Office of Sustainability	Number of C-PACE projects
CB-1D	Conduct outreach and/or trainings regarding the benefits of energy efficiency measures and encourage solar or other non GHG emitting renewable energy installations.	N	Y		Easton Business Association/Office of Sustainability	Number of people attending trainings
CB-1E*	Research options for new tax incentives, grants, subsidies, or other financial support for retrofits and energy efficiency measures.	N	Y		Office of Sustainability	Number of programs listed for residents to utilize

* community priority expressed in survey or interview

Objective CB 2 – New Commercial Buildings

Ensure new commercial buildings are constructed to minimize emissions



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
CB-2A*	Encourage use of net-zero emissions (NZE) building standards or design standards like LEED (Leadership in Energy and Environmental Design) for new construction, and the installation of renewable energy options on-site (solar panels, etc.). Consider requiring net-zero for all new construction and major retrofits.	N	Y		Office of Sustainability	Number of buildings using these standards
CB- 2B*	Review and update building codes to promote increased efficiency and decrease emissions	N	Y		Dept. of Planning and Codes	New codes enacted
CB-2C*	Encourage (and consider requiring) green space included for all commercial development/redevelopment	N	N		Office of Sustainability	Number of projects

* community priority expressed in survey or interview

7. Residential Buildings

Energy consumed in residential buildings accounts for 45% of the City of Easton's total GHG emissions. Improving the efficiency of our residential building stock will contribute significantly to achieving City of Easton'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.

Objective	Supporting Actions	Benefits	Reduction Potential
RB 1 – Support retrofits and energy efficiency measures in existing residential buildings and homes	EP1, UF1, PE1, PE 2	   	  
RB 2 – Ensure new residential buildings and homes are built to maximize energy efficiency	EP1, EP 2, EP 3, UF1	   	 

Objective RB1 – Existing Residential Buildings

Support retrofits and energy efficiency measures in existing residential buildings and homes



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
RB-1A *	Expand existing home energy efficiency programs, providing free materials or kits targeting lower incomes. Consider partnering with the West Ward Community Initiative for community outreach.	E	Y		CACLV/Utilities/Office of Sustainability	Number of homes involved in program
RB- 1B *	Establish a program for replacing appliances and systems with high-efficiency electric options. Include a pool of qualified contractors. Partner with utilities to expand existing rebate options. Ensure that this makes appliance upgrades possible for low- and middle income households.	E	Y		Utilities/Dept. of Community and Economic Development	Number of households utilizing program
RB-1C *	Provide incentives for rental property owners to increase energy efficiency of their properties. This should be tied to renewal of rental license.	N	Y		Code Enforcement/Office of Sustainability	Number of improved properties
RB-1D	Educate homeowners about the home comfort and cost-saving benefits of energy efficiency measures and assist in evaluation homes for installation of solar panels and other non GHG emitting energy sources.	N	Y		Office of Sustainability/Utilities	Number of residents reached

* community priority expressed in survey or interview

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	Co-Benefits	Lead Actor	Metric
RB-2A	Encourage or consider requiring use of net-zero emissions (NZE) building standards or design standards like LEED (Leadership in Energy and Environmental Design) for new construction.	N	Y		Office of Sustainability	Number of buildings using these standards
RB- 2B	Review and update building codes to promote increased efficiency and reduced emissions.	N	Y		Dept. of Planning and Codes	New codes enacted

* community priority expressed in survey or interview

8. Energy Production

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. Energy Production is a cross-cutting sector in that nearly all activities that take place in the community require energy of some sort. While state or federal policies that would increase the percentage of electricity generated through renewable sources are under consideration, opportunities also exist for residents and Easton'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.

Objective	Supporting Actions	Benefits	Reduction Potential
EP 1 – Educate residents and businesses about the benefits of renewable energy and the options available to them.	PE1, PE 2	   	
EP 2 – Maximize energy generated by small scale renewable energy systems within the city	CB1, CB 2, RB 1, RB 2	   	
EP 3 – Support policy changes that expand renewable electricity options for all Easton residents	PE1, PE 2	  	

Objective EP1 – Education About Energy Options

Educate residents and businesses about the benefits of renewable energy and the options available to them.



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
EP-1A*	Create educational events and materials regarding the importance of energy conservation, retail electric shopping, the availability of renewable options, and how to choose a household energy supplier.	N	N		Office of Sustainability, Utilities	Number of people reached

* community priority expressed in survey or interview

Objective EP 2 – Small-Scale Renewable Energy Systems

Maximize energy generated by small scale renewable energy systems within the city



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
EP-2A*	Publicize and expand incentives for installation of rooftop solar on residential and commercial properties. Revise any building codes and ordinances that may act as obstacles.	E	Y		Dept. of Planning and Codes, Office of Sustainability	Number of RE systems installed; amount of energy generated
EP- 2B*	Lead by example by installing solar panels on city buildings if and where possible.	N	Y		Public Works Department	Amount of energy generated
EP-2C	Continue to pursue small-scale hydroelectric projects on the Lehigh and Delaware canals.	E	N		Hydroelectric power company, City government	Amount of energy generated
EP-2D	Continue development of the methane capture cogeneration project at Easton Joint Sewer Authority treatment plant	E	Y		EAJSA, Dept. of Public Works	Percentage of plant energy generated
EP-2E*	Provide support for solar installation on new construction and major renovation projects.	N	N		Dept. of Planning and Codes	Amount of energy generated

* community priority expressed in survey or interview

Objective EP 3 – Local Renewable Generation

Support policy changes that expand renewable electricity options for all Easton residents



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
EP-3A	Support proposed legislation that would enable community solar projects, where multiple parties share ownership of a central solar generation site if they cannot install renewables on their own property.	N	N		City Council	Enabling legislation enacted in the state legislature
EP-3B	Explore Community Choice Aggregation (CCA) as a means of increasing local control over electricity sources to receive lower-carbon electricity at a lower price.	N	N		City Council	Establishment of CCA
EP-3C	Prioritize local renewable electricity options. Consider options for financing a renewable power project that could sell power to a retail supplier and then to consumers at a low cost. An RFI could explore developer interest in this type of project. Consider any renewable energy sources (wind, solar, geothermal).	N	N		Dept. of Public Works	Construction of a new local renewable project
EP-4C	Encourage intermunicipal cooperation for renewable energy projects at regional scale.	N	N		Dept. of Public Works, City Council	Engagement in cooperative projects and discussions.

* community priority expressed in survey or interview

9. Waste, Composting, & Recycling

The City of Easton's solid waste is disposed of, primarily, at Chrin Brothers Landfill located on Industrial Drive in Williams Township, Northampton County. Emissions from decaying material directly contribute 3% of the City of Easton'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 the City of Easton's long-term interest to reduce waste at its source, expand recycling and its popular composting program, reduce food waste, encourage remanufacturing, and enable re-use of materials. This chapter focuses on opportunities to reduce waste, recycle or compost what cannot be reused, and make remaining waste management operations less carbon-intensive.

Objective	Supporting Actions	Benefits	Reduction Potential
WR 1 – Reduce solid waste generation	LF1, LF2, PE1, PE2	 	
WR 2 – Increase recycling and composting to redirect waste away from landfills	LF1, PE1, PE2	  	
WR 3 – Reduce emissions from current waste management practices	M01	 	

Objective WR 1 – Reduce Solid Waste

Reduce solid waste generation



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WR-1A*	Consider incentive programs for residents who reduce the quantity of waste they send to landfills (increase charges for curbside waste pickup and reduce or eliminate charges for recycling/compost.)	N	Y		Office of Sustainability, Public Works	Number of households participating in incentive program
WR-1B*	Eliminate single use plastics	N	N		City Council	Creation of new ordinance
WR-1C	Minimize waste produced at city festivals and large events. Strategies include providing composting and recycling bins, encouraging use of reusable utensils and mugs, or requiring food vendors to meet certain low-waste standards.	N	Y		Office of Sustainability	Reduction in amount of trash produced at annual festivals
WR-1D*	Provide information and education to residents and business owners on strategies to reduce waste and alternatives to single use products.	N	Y		Easton Business Association, Office of Sustainability	Number of people reached
WR-1E	Reduce waste generated from construction. Implement standards from the International Green Construction Code or LEED, and encourage reuse and retrofit of existing structures.	N	Y		City Council, Dept. of Planning and Codes	Revision to codes

WR-1F*	Encourage reuse and repair of consumer products, rather than throwing them away. This could include a system for redistributing items to charities and schools, a tool library, a repair café, and/or workshops to teach people how to repair clothes or household items.	N	Y		Office of Sustainability, Public Library	Number of people reached, creation of tool library or repair café
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* community priority expressed in survey or interview

Objective WR 2 – Recycling and Composting

Increase recycling and composting to redirect waste away from landfills



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WR-2A*	Add recycling containers to public parks and Centre Square.	N	Y		Dept. of Public Works	Amount of recyclables collected in public areas
WR-2B*	Continue to encourage effective residential recycling through incentive programs and educational efforts.	E	Y		Dept. of Public Works, Office of Sustainability	Number of households participating in program
WR-2C*	Increase recycling opportunities for items that can't be recycled curbside, including batteries, fluorescent lights, electronics, tires, and textiles. Have convenient drop-off locations or periodic collection	E	Y		Dept. of Public Works, Office of Sustainability	Amount of recycling collected at these events
WR-2D*	Support an expanded compost program, with a curbside pickup option. Program should include residential and restaurants and businesses.	E	Y		Greater Easton Development Partnership	Quantity of compostable material collected, compost distributed

WR-2E	Conduct a study of waste from food establishments to develop strategies to reduce waste sent to landfill. Work with local university students or Lehigh Valley Alliance for Sustainable Communities interns for this.	N	N		Office of Sustainability	Results of study
WR-2F	Encourage eco-friendly remanufacture industries to locate in Easton	N	N		Office of Sustainability	Number of new entities

* community priority expressed in survey or interview

Objective WR 3 – Current Practices

Reduce emissions from current waste management practices



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WR-3A	Explore the feasibility of converting trash and recycling trucks to low- and eventually no-emission vehicles.	N	Y		Republic Services, other trash haulers, Office of Sustainability	Number of trucks converted
WR-3B	Encourage best practices at local landfills. This could include expansion of Chrin Brothers, Inc. landfill methane-to-energy facility.	E	N		Chrin Brothers, Inc.	Increase in energy generated from methane to energy, compliance with all DEP standards.
WR-3C	Ensure residents are aware of proper disposal methods for refrigerators, freezers, and air conditioners containing refrigerants. Consider offering incentives for appliance pickup to increase compliance.	N	N		Office of Sustainability, Dept. of Public Works	Number of people reached, number of people receiving incentive

* community priority expressed in survey or interview

10. Water & Wastewater Management

The City of Easton's water is provided by the Easton Suburban Water Authority, and its wastewater is treated by the Easton Area Joint Sewer Authority. These entities serve Easton and the surrounding municipalities. City administration can work with leadership at the Authorities and representatives of other municipalities to implement strategies like those described in the second objective in this section to reduce emissions from operations while continuing to provide sewer services and clean water to Easton residents at a low cost. The other objectives in this section reduce the quantity of stormwater that flows into the wastewater treatment plant and protect water quality in the Delaware and Lehigh Rivers as well as local tributaries such as the Bushkill Creek. Protection of riparian areas and stream bank restoration is important for mitigating impacts of increased risk of flooding due to climate change.

Objective	Supporting Actions	Benefits	Reduction Potential
WW1 – Use stormwater best management practices	UF1, UF 2, LF1, PE1	   	
WW 2 – Implement energy conservation at the wastewater treatment plant	MO1, EP 2	 	
WW 3 – Protect floodplains and riparian areas	WR 1, WW1, UF 2	  	

Objective WW1 – Stormwater Management

Use stormwater best management practices



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WW-1A	Explore ways to incorporate PA DEP's Stormwater Best Management Practices Manual as standard operating procedure	N	Y		Dept. of Public Works	New projects implementing stormwater BMPs
WW-1B*	In addition to the existing stormwater fee, incentivize property owners to minimize impervious surface, harvest rainwater, and/or install green infrastructure such as rain gardens and green roofs. Consider tighter ordinance requirements for impervious surfaces.	N	Y		Office of Sustainability Zoning Department, Dept. of Planning and Codes	Program participation Ordinance updates

* community priority expressed in survey or interview

Objective WW2 – Wastewater Treatment Operations

Implement energy conservation at the wastewater treatment plant



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WW-2A	Upgrade the mechanical and electrical systems at Easton Joint Sewer Authority treatment plant	N	N		EAJSA	Reduction in plant energy usage
WW-2B	Participate in energy efficiency incentive programs to upgrade pump efficiency	N	N		EAJSA	Reduction in plant energy usage

* community priority expressed in survey or interview

Objective WW 3 – Floodplains and Riparian Areas

Protect floodplains and riparian areas



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
WW-3A	Promote funding streams for restoration projects through Northampton County and programs like Lehigh Valley Greenways' Mini-Grants	N	Y		Office of Sustainability	Funds for restoration projects received
WW-3B	Explore opportunities for funding for streambank restorations on private property	N	Y		Office of Sustainability	Creation of resource for property owners
WW-3C*	Continue to consider the importance of naturalized floodplains, buffers, and riparian areas when making zoning and development decisions.	E	N		Zoning Department, Dept. of Planning and Codes	Zoning ordinances
WW-3D	Continue to protect and improved buffers and riparian areas on city-owned land and in public parks.	E	Y		Dept. of Public Works, Parks and Recreation	Management practices for city land/parks

* community priority expressed in survey or interview

11. Transportation

Transportation is one of the most visible sources of emissions in the City of Easton. Besides emitting greenhouse gases, cars, buses, and trucks that burn fossil fuels also produce a host of criteria air pollutants in exhaust, reducing local air quality and affecting our health. Transportation accounts for 24% of the City of Easton's total GHG emissions. This chapter focuses on programs and policies to reduce emissions from transportation and includes expansion of alternate modes such as walking, biking, or public transportation to and from the most common destinations in the City of Easton as well as increased adoption of electric vehicles (EVs). It is important to note that the level of GHG reduction achieved by converting to EVs is largely dependent on the electricity sources used to charge the vehicles, but even given the current mix in our electricity grid, operating an EV results in the release of less greenhouse gases than a conventional vehicle.

Objective	Supporting Actions	Benefits	Reduction Potential
TR 1 – Reduce vehicle miles traveled by single-occupancy vehicles	UF 2, LF1, PE1	   	  
TR 2 – Support adoption of electric vehicles (EVs)	M0 1, EP 3, WR 3, PE 1	  	  

Objective TR 1 – Reduce single-occupancy vehicles

Reduce vehicle miles traveled by single-occupancy vehicles



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
TR-1A*	Enhance LANTA bus service by supporting increase in state funding and making service more convenient to attract more riders.	E	Y		LANTA, Office of Sustainability	Reduced travel times to Bethlehem/Allentown, reduced wait times, increased ridership
TR-1B*	Participate in regional efforts to further expand public transportation options, including the possibility of a light-rail system in the Lehigh Valley.	N	Y		LVPC, Office of Sustainability	Meeting held with regional partners
TR-1C*	Make infrastructure improvements to enhance cyclist and pedestrian safety and ease of movement (bike lanes, signage, traffic calming measures, sheltered bike racks, places to lock bikes, requirements for bike storage and parking facilities in new residential development).	E	Y		Dept. of Public Works, City Planning and Zoning Department	Identification of "problem" intersections, implementation of improvements in those locations
TR-1D*	Encourage biking and walking through education and incentive programs in partnership with local businesses. Consider a bike share program for low-income, workshops for e-bike conversions, and rentable bikes downtown for visitors to the city.	E	Y		Office of Sustainability, Easton Business Association	Number of people reached

TR-1E*	Consider creating pedestrian zones that are closed to vehicles, potentially along Larry Holmes Drive or around Centre Square.	N	Y		Zoning Department, Planning Commission, Dept. of Public Works	Creation of pedestrian zones
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* community priority expressed in survey or interview

Objective TR 2 – Support electric vehicles

Support adoption of electric vehicles (EVs)



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
TR-2A	Continue to add electric vehicle charging infrastructure throughout the city. Look into state and federal rebate programs for municipalities and businesses.	E	Y		Dept. of Public Works	Number of EV chargers added
TR-2B	As described in strategies in the municipal operations and waste sectors, research and pursue opportunities to convert bus, truck, and other vehicle fleets to EVs.	N	Y		Office of Sustainability	Number of vehicles converted
TR-2C	Incentivize resident use of EVs through tax benefits, free parking, or other means. Since EVs are less accessible to low-income residents, consider equity in this strategy by similarly rewarding/incentivizing people who don't own cars, car-share, take public transportation, etc. Consider an EV car share/short term rental program.	N	Y		Office of Sustainability	Number of residents receiving incentive

* community priority expressed in survey or interview

12. Urban Forest, Green Space, and Habitat

One feature that makes Easton an appealing place to live is the presence of trees and parks throughout the city in addition to natural resources like the river front and beautiful trails in the surrounding area. These green spaces also play important roles providing habitat for native species and serving as a natural “sink” for carbon dioxide in the atmosphere. Increasing trees and green space can help us reduce the carbon dioxide that contributes to climate change while also becoming more resilient to the effects of climate change such as extreme heat and heavy precipitation, as vegetated areas reduce the urban heat island effect and need for air conditioning and absorb stormwater runoff. In addition, green spaces and trees are associated with improved physical and mental health, reduced stress, lower levels of crime, and increased property values.

Objective	Supporting Actions	Benefits	Reduction Potential
UF 1 – Continue to grow Easton’s urban forest	WW1, WW3, PE 1, PE 2	   	
UF 2 – Increase and enhance Easton’s green space for the benefit of both native species and Easton residents	WW1, WW3, TR 1, LF1	   	

Objective UF 1 – Easton’s Urban Forest

Continue to grow Easton’s urban forest



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
UF-1A	Continue to expand tree planting efforts along city streets and in parks. Plan long-term for species that can tolerate future conditions.	E	Y		City Forester	Number of trees planted
UF-1B*	Consider city ownership of trees or programs to help residents pay for care/maintenance so that residents of all income levels can benefit.	N	Y		City Forester, City Council	Number of trees planted through this support program
UF-1C	Hold educational events/programs and distribute information about choosing an appropriate tree species for a given space and the benefits of trees included reduced energy costs from planting adjacent to buildings.	E	N		City Forester, EAC	Number of people reached

* community priority expressed in survey or interview

Objective UF 2 – Green Space and Habitat

Increase and enhance Easton’s green space for the benefit of both native species and Easton residents



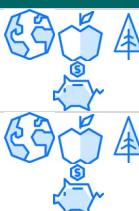
Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
UF-2A	Promote alternatives to mowing, including meadows, native plants, and trees. Consider revisions to ordinances if needed to allow taller grass or wildflowers.	N	Y		Dept. of Planning and Codes, City Council, Easton EAC	Revised Ordinances

	Celebrate and protect Easton's distinct waterfront by enhancing river access points, connecting the riverfront to the downtown, maintaining riparian areas, and controlling invasive species.	E	Y		Dept. of Public Works	Biodiversity, management of invasive species along waterfront
UF-2C	Provide education to residents and property owners for projects that support native habitat, such as pollinator centers, native gardens, and shelter for birds, bats, insects.	N	Y		Office of Sustainability	Number of people reached
UF-2D*	Consider new developments' impact on green space. Encourage higher density and mixed use development, consider maintaining green space in vacant lots rather than new construction, encourage sustainable uses for brownfield development, etc. Prioritize purchasing and converting flood prone and steep slope properties to natural or park land.	N	N		Dept. of Planning and Codes, Zoning Dept.	Area of green space within the city
UF-2E*	Engage in regional discussions about the construction of large distribution centers and warehouses to address resident environmental and quality of life concerns including energy consumption, transportation impacts, air quality impacts, and increased stormwater and impervious surfaces.	E	N		Office of Sustainability, LVPC	Easton represented in regional discussions

* community priority expressed in survey or interview

13. Local Food & Agriculture

Easton is proud to be home to the Easton Farmers' Market, the oldest continuous open-air market in the country. In addition, many residents' long-standing tradition of growing their own food has given rise to a resurgence in community gardening in recent years. Outside of city limits, the Lehigh Valley's rich farmland supports many local farmers. Supporting Easton residents' access to these sources of local fresh food can help reduce vehicle miles traveled by the food we eat, preserve nearby farmland, increase green space in the city, and encourage consumption of fruits and vegetables instead of processed foods that create more greenhouse gas emissions during production. For residents, fresh local food can improve health and quality of life.

Objective	Supporting Actions	Benefits	Reduction Potential
LF1 – Expand food production within the city	WR 2, WW1, TR 1, UF 2, PE1, PE 2		
LF2 – Support local agriculture and the local food system	TR 1, PE1, PE 2		

Objective LF1 – Expand food production

Expand food production within the city



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
LF-1A*	Continue to support and expand the community gardening program. Identify a partner to start a tool and garden seed library. Focus on how renters can grow their own food through block share of raised bed gardens.	E	N		GEDP, Easton Urban Farm, Easton Neighborhood Center, and Lafayette College	Food produced in community gardens
LF-1B*	Partner with city and regional organizations to provide educational opportunities for residents interested in producing their own food.	N	N		Office of Sustainability	Number of people reached

* community priority expressed in survey or interview

Objective LF2 – Local Agriculture

Support local agriculture and the local food system



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
LF-2A*	Provide information about healthy eating and the environmental impact of food in schools (partner with Kellyn and Nurture Nature Center/BFBL)	N	N		EASD, Office of Sustainability	Number of students reached
LF-2B*	Encourage institutions to purchase more local food. Require city funds for food to prioritize local, organically grown food.	N	N		Office of Sustainability, Buy Fresh Buy Local GLV	Pounds of local food purchased by participating institutions

	Continue to expand programs to connect city residents of all income levels to sources of local fresh food, including the Easton Farmers' Market, Easton Public Market, Buy Fresh Buy Local Fresh Food Bucks, Kellyn Mobile Mart, Vegetables in Community, etc.	E	N		GEDP, Community Schools, Buy Fresh Buy Local GLV	Number of residents served
LF-2C*	Explore the possibility of developing a bulk food store in Easton to expand affordable, sustainable food options in areas that may lack access to a grocery store and minimize food packaging waste. Partner with Nature's Way to expand their bulk items.	N	N		Office of Sustainability	Study of feasibility, potential sites

* community priority expressed in survey or interview

14. Public Engagement & Education

The previous sections of this plan describe many strategies that either explicitly mention creating public education programs or will rely on the involvement and support of Easton's residents to implement. This chapter includes actions that would create a cohesive education and engagement plan for the CAP as a whole. A particularly rich opportunity for climate education exists in Easton's schools, as young people are increasingly concerned about how action taken on climate change now will affect the course of their lives. For students as well as adult residents of Easton, simply learning about the issue of climate change can be a daunting undertaking, which is why it is so important to make information about how to reduce and prepare for climate change as a community accessible resource and to create routes for residents to be engaged in projects to support the current and future wellbeing of their community.

Objective	Supporting Actions	Benefits	Reduction Potential
PE 1 – Share information about new and expanded initiatives, public education campaigns, and important city actions with regard to the CAP through a variety of channels	RB 1, EP 1, UF 1, LF 1	   	
PE 2 – Partner with schools to develop civic and environmental literacy in K-12 students	WW 3, UF 1, LF 1, LF 2	 	
PE 3 – Continued transparency, progress reports, and public engagement regarding this Climate Action Plan	MO 2		

Objective PE1 – Public Outreach

Share information about new and expanded initiatives, public education campaigns, and important city actions with regard to the CAP through a variety of channels



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
PE-1A	Assign a new or existing city staff member the role of coordinating outreach efforts regarding CAP programs. Create a centralized city climate action plan and energy website with all plan documents, inventories, monitoring reports, progress metrics, resources for residents, links to energy providers, incentive programs, electric vehicle charging station locations, and home energy efficiency information. CAP updates should also be part of city council agenda.	N	N		City Council/Mayor	Establishment of outreach coordination role
PE-1B*	Partner with trusted community organizations to conduct multilingual outreach, educate about climate-related issues, and promote new incentives or funding opportunities.	N	N		Office of Sustainability	Number of partners
PE-1C*	Include in a new or existing monthly newsletter updates about CAP and sustainability related programming. Use physical mailings in addition to online distribution.	N	N		Office of Sustainability	Distribution of newsletter

* community priority expressed in survey or interview

Objective PE 2 – K-12 Schools

Partner with schools to develop civic and environmental literacy in K-12 students



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
PE-2A	Promote leadership opportunities such as those offered by the Alliance for Climate Education to interested students	N	N		Office of Sustainability, EASD	Number of students involved
PE-2B*	Involve local schools in the implementation of this CAP however possible – through working with teachers to develop educational materials, involving students in volunteer projects, etc.	N	N		Office of Sustainability, EASD	Number of students involved
PE-2C*	Create volunteer opportunities for required community service hours and incentivize students to participate by getting a day off school or special honor at graduation	N	N		Office of Sustainability, EASD	Number of opportunities created
PE-2D*	Encourage/facilitate field trips to community gardens, microforest, energy efficient buildings, and other CAP strategies/efforts for student learning opportunities.	N	N		Office of Sustainability, EASD	Number of field trips

* community priority expressed in survey or interview

Objective PE 3 – CAP Reporting

Continued transparency, progress reports, and public engagement regarding this Climate Action Plan



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Co-Benefits	Lead Actor	Metric
PE-3A*	Hold inclusive discussions regarding climate change policies and programs. Seek to engage residents across the city and acknowledge their thoughts and preferences.	N	N		Office of Sustainability	Number of residents engaged
PE-2B*	Track progress on the CAP using established metrics and report to the public in clear terms on a regular basis. Have an online dashboard with updated CAP information and metric tracking for all residents to access (see PE-1A).	N	N		Office of Sustainability	Establishment of regular reporting process

* community priority expressed in survey or interview

15. 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 City of Easton does not currently have the capacity to complete a more robust climate vulnerability assessment and adaptation action plan, 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).

The annual average temperature of Easton is currently 49.36°F (based on data from 1981-2010) with an observed change of 1.2°F (compared to historical data from 1951-1980). With the effects of climate change, projected changes are expected to range from 2.15°F to 5.91°F (these are based on the difference between current conditions and the projected period 2041-2070). Easton could see an increase of 40 to 50 days with temperatures exceeding 90°F. It is expected that extreme heat events that have been observed every 20 years could happen as often as every two to four years. Impacts will continue into the foreseeable future due to the buildup of emissions in the atmosphere that last for hundreds of years, thus it is important to take action as soon as possible.

Extreme temperatures are not only dangerous during the day but can prevent an area from properly cooling during the evening. This lack of cooling (elevated nighttime temperatures) makes extended heat waves more dangerous. The classification of a heat wave requires three daily consecutive highs above 90°F, but the total number of days above 90°F can indicate a hotter environment as well. Further, due to the urban heat island (UHI) effect, some areas of Easton may be more at risk than others during extreme heat events. The UHI effect is a phenomenon in urban areas that causes higher air and surface temperatures in cities compared to adjacent rural and suburban environments. The UHI effect is mainly due to the landscape qualities of an urban area including increased manmade materials and reduced green spaces. Due to the increased temperatures, high amounts of impervious surfaces, reduced green spaces and tree canopy coverage, urban areas have high energy consumption due to cooling needs. With the changing climate, the UHI effect will become more prevalent in the future and will be a factor in Easton's vulnerability to extreme heat events.

The City of Easton used the U.S. Climate Explorer to identify likely changes from today through 2090. 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 indicates that average daily temperatures have been increasing and will continue to rise through 2100 under both lower and higher emissions scenarios but much more dramatically under higher emissions, which could impact agriculture, public health, and other sectors of the community.

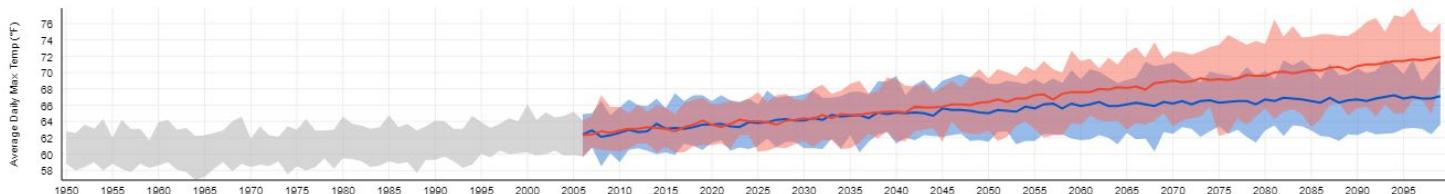
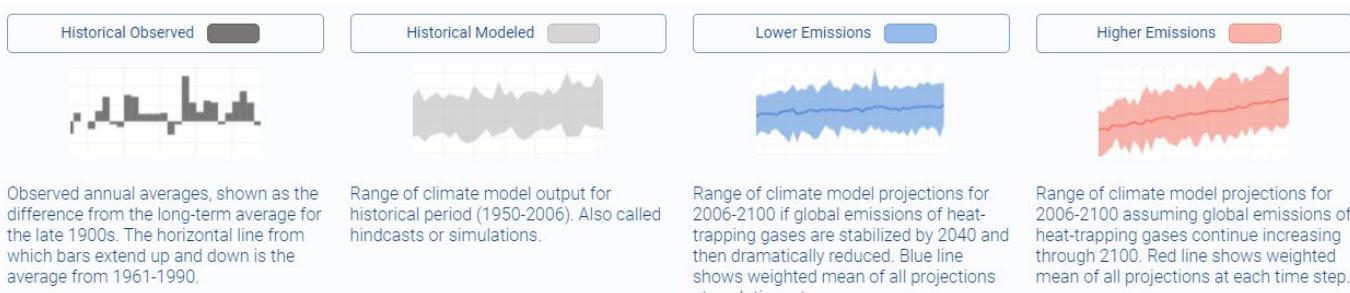


Figure 5: Average Daily Maximum Temperature Between 1950–2090 for the City of Easton, PA



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)
 - Onsite combined heat and power (CHP)
 - Smart grid technologies
 - Microgrids
- 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

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]
MO-1B - Continue to invest in energy efficiency measures whenever possible, including LED lightbulbs, system upgrades, programmable thermostats	X				
MO-1C - Lead by example and require all city buildings to meet higher energy efficiency standards.	X				
MO-2A - Create an Office of Sustainability that would be able to oversee the programs described in this plan and coordinate efforts between city departments and external partners.	X	X	X	X	
MO-2C - Integrate climate change considerations into all city planning and decision-making, including comprehensive plan, local hazard mitigation plan, stormwater management, zoning and land use decisions, etc.	X	X	X	X	
MO-2D - Coordinate the efforts of key partners to implement each CAP strategy, including city departments, city council, individual Easton residents, the Environmental Advisory Council, municipal authorities, area health networks, local businesses, nonprofit organizations, schools, utilities, and other entities as appropriate	X	X	X	X	
CB-1B - Establish a building retrofit program to replace fossil fuel appliances and systems with electric options.	X				
CB-1C - Promote the Pennsylvania C-PACE program and local utility rebate programs to commercial building owners as a means of financing system retrofits and energy efficiency measures.	X				
CB-2B - Review and update building codes as possible.	X	X			

RB-1A - Expand existing home weatherization/energy efficiency programs.	X	X	
RB-1B - Establish a program for replacing appliances and systems with high-efficiency electric options. Include a pool of qualified contractors. Partner with utilities to expand existing rebate options. Ensure that this makes appliance upgrades possible for low-income households.	X		
RB-2B - Review and update building codes as possible.	X	X	
EP-3A - Support proposed legislation that would enable community solar projects, where multiple parties share ownership of a central solar generation site if they cannot install renewables on their own property.	X		Severe Storms
EP-3C - Prioritize local renewable electricity options. Consider options for financing a renewable power project that could sell power to a retail supplier and then to consumers at a low cost. An RFI could explore developer interest in this type of project	X		Severe Storms
WW-1A - Explore ways to incorporate PA DEP's Stormwater Best Management Practices Manual as standard operating procedure	X	X	
WW-1B - In addition to the existing stormwater fee, incentivize property owners to minimize impervious surface, harvest rainwater, and/or install green infrastructure.	X	X	
WW-2A - Upgrade the mechanical and electrical systems at Easton Joint Sewer Authority treatment plant	X		Severe Storms
WW-3A - Promote funding streams for restoration projects through Northampton County and programs like Lehigh Valley Greenways' Mini-Grants	X		

WW-3B - Explore opportunities for funding for streambank restorations on private property	X		
WW-3C - Continue to consider the importance of naturalized floodplains and riparian areas when making zoning and development decisions.	X		
WW-3D - Continue to protect and improved riparian areas on city-owned land and in public parks.	X		
TR-1A - Enhance LANTA bus service	X		
UF-1A - Continue to expand tree planting efforts along city streets and in parks. Plan long-term for species that can tolerate future conditions.	X	X	X
UF-1B - Consider city ownership of trees or programs to help residents pay for care/maintenance so that residents of all income levels can benefit.	X	X	
UF-2A - Promote alternatives to mowing, including meadows, native plants, and trees. Consider revisions to ordinances if needed to allow taller grass.		X	X
UF-2B - Celebrate and protect Easton's distinct waterfront by enhancing river access points, connecting the riverfront to the downtown, maintaining riparian areas, and controlling invasive species.	X	X	
UF-2D - Consider new developments' impact on green space. Encourage higher density and mixed use development, consider maintaining green space in vacant lots rather than new construction, encourage sustainable uses for brownfield development, etc.	X	X	
LF-1A - Continue to support and expand the community gardening program	X		X
LF-1B - Partner with city and regional organizations to provide educational opportunities for residents interested in producing their own food.			X

LF-2B - Encourage institutions to purchase more local food	X
LF-2C - Continue to expand programs to connect city residents of all income levels to sources of local fresh food, including the Easton Farmers' Market, Easton Public Market, Buy Fresh Buy Local Fresh Food Bucks, Kellyn Mobile Mart, Vegetables in Community, etc.	X
PE-1B - Partner with trusted community organizations to conduct multilingual outreach, educate about climate-related issues, and promote new incentives or funding opportunities.	X X X X

Additional climate adaptation measures may be adopted as part of the city's hazard mitigation or comprehensive planning. These may be related to the above strategies for climate action. For example, in addition to enhancing the urban forest, Easton may prepare for extreme heat by providing community space to serve as a cooling center in every neighborhood, providing energy efficient window unit air conditioners, or distributing resources regarding heat-related illness.

Other adaptation measures for consideration in future planning efforts include:

- Creating a working group or committee responsible for reviewing and updating the City's Climate Vulnerability Assessment to prioritize future adaptation projects
- Utilizing the National Flood Insurance Program Community Rating System (CRS) to become more resilient to flood risks and reduce flood insurance costs for residents and businesses.
- Implementing resilient development design guidelines (e.g. New York City's Climate Resiliency Design Guidelines or City of Boston Climate Resilience Checklist)
- Increasing use of green space or other strategies to reduce the impact of the urban heat island effect in neighborhoods most vulnerable to extreme heat (see Philadelphia's "Beat the Heat" toolkit)
- Establishing a community center in every neighborhood to serve as shelter in case of extreme heat or cold and as a hub for information

16. Monitoring Plan

Starting in July 2021, the City of Easton will engage with community members, businesses, institutions, and other stakeholders through a Climate Action Planning Task Force, of which the Easton Environmental Advisory Council would be a part, to prepare for any prerequisite or additional actions needed to begin Plan implementation.

These prerequisite actions include:

- Creating citizen advisory groups for programs that require considerable community engagement.
- Gathering bids for contracted services and equipment.
- Making necessary changes to local policies or existing programs, including staffing.
- Considering the creation of an Office of Sustainability within the City with a permanent director position to lead.

Establishing a monitoring process enables the City of Easton 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 four years and in addition to the components in the action report, will include an updated community and municipal GHG inventory. This will help the City of Easton 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 2023 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

17. References

- Intergovernmental Panel on Climate Change (IPCC). (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerabilities: Summary for Policymakers. New York, NY: Cambridge University Press.
- 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.
- 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 Abler, 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%20OPEN%20NSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%20UPDATE.PDF%20>

Appendix I: Methodology

Energy

The following table shows each activity related to energy consumption, data source, and notes on data gaps.

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Residential, commercial, and industrial electricity consumption	First Energy Corp.	
Residential, commercial, and industrial natural gas consumption	UGI Corporation	
Local Government Operations		
Electricity consumption	City of Easton	
Natural gas consumption	City of Easton/UGI	

Year	CO ₂ (lbs./MWh)	CH ₄ (lbs./GWh)	N ₂ O (lbs./GWh)
2018	Not Available	Not Available	Not Available

Transportation

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Vehicle miles travelled	PENN DOT / US Dept of Transportation	
Transit ridership	LANTA	
Local Government Operations		
Government vehicle fleet	City of Easton	

For vehicle transportation, it is necessary to apply average miles per gallon and emissions factors for CH₄ and N₂O to each vehicle type. The factors used are shown in Table 6.

Fuel	Vehicle type	MPG	CH ₄ g/mile	N ₂ O g/mile
Gasoline	Passenger car	22	0.0173	0.0066
Gasoline	Light truck	6.4	0.0163	0.0066
Gasoline	Heavy truck	6.4	0.0333	0.0134
Diesel	Passenger car	22	0.0005	0.0010
Diesel	Light truck	6.4	0.0010	0.0015
Diesel	Heavy truck	6.4	0.0051	0.0048

Wastewater

Activity	Data Source	Data Gaps/Assumptions
Communitywide & Local Government Operations		
Nitrogen Discharge		
Digester Gas Combustion/Flaring	City of Easton	Serves 8 different jurisdictions

Potable Water

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Water Supply	Easton Suburban Water Authority	ESWA provides water to seven different jurisdictions in addition to Easton
Local Government Operations		
Water Supply	Easton Suburban Water Authority	

Solid Waste

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Landfill Contribution	PA Department of Environmental Protection	Data provided was total Landfill waste. Easton's contribution was determined based on population.

Inventory Calculations

The 2018 inventory was calculated following the US Community Protocol and ICLEI's ClearPath software. As discussed in Inventory Methodology, the IPCC 5th Assessment was used for global warming potential (GWP) values to convert methane and nitrous oxide to CO₂ equivalent units. ClearPath's inventory calculators allow for input of the sector activity (i.e. kWh or VMT) and emission factor to calculate the final CO₂e emissions. For more details on ClearPath and the methodology utilized in the software please see <https://icleiusa.org/clearpath/>.

Appendix II: Climate Change Science

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).

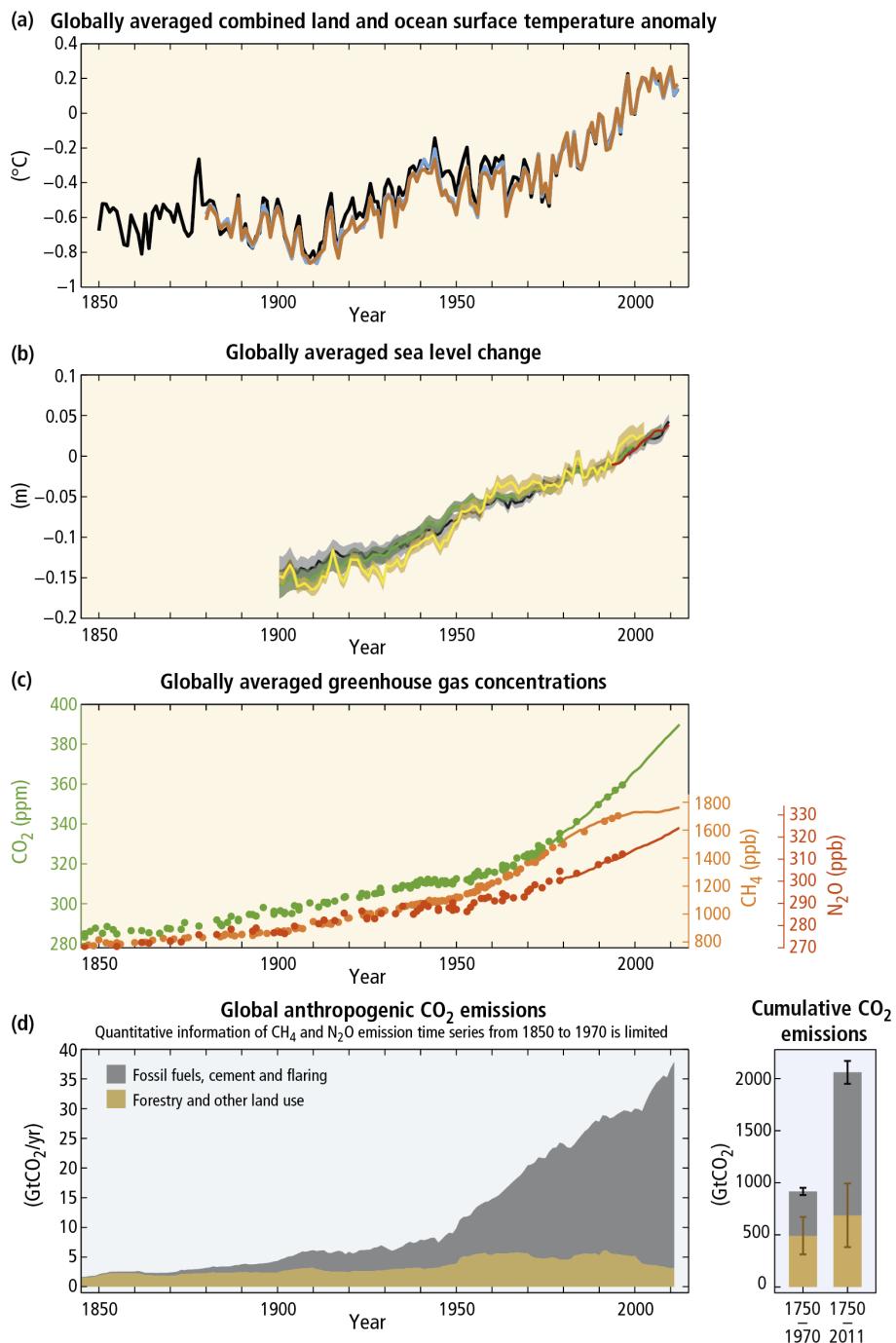


Figure 1 Observations and other indicators of a changing global climate system

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 forcings 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

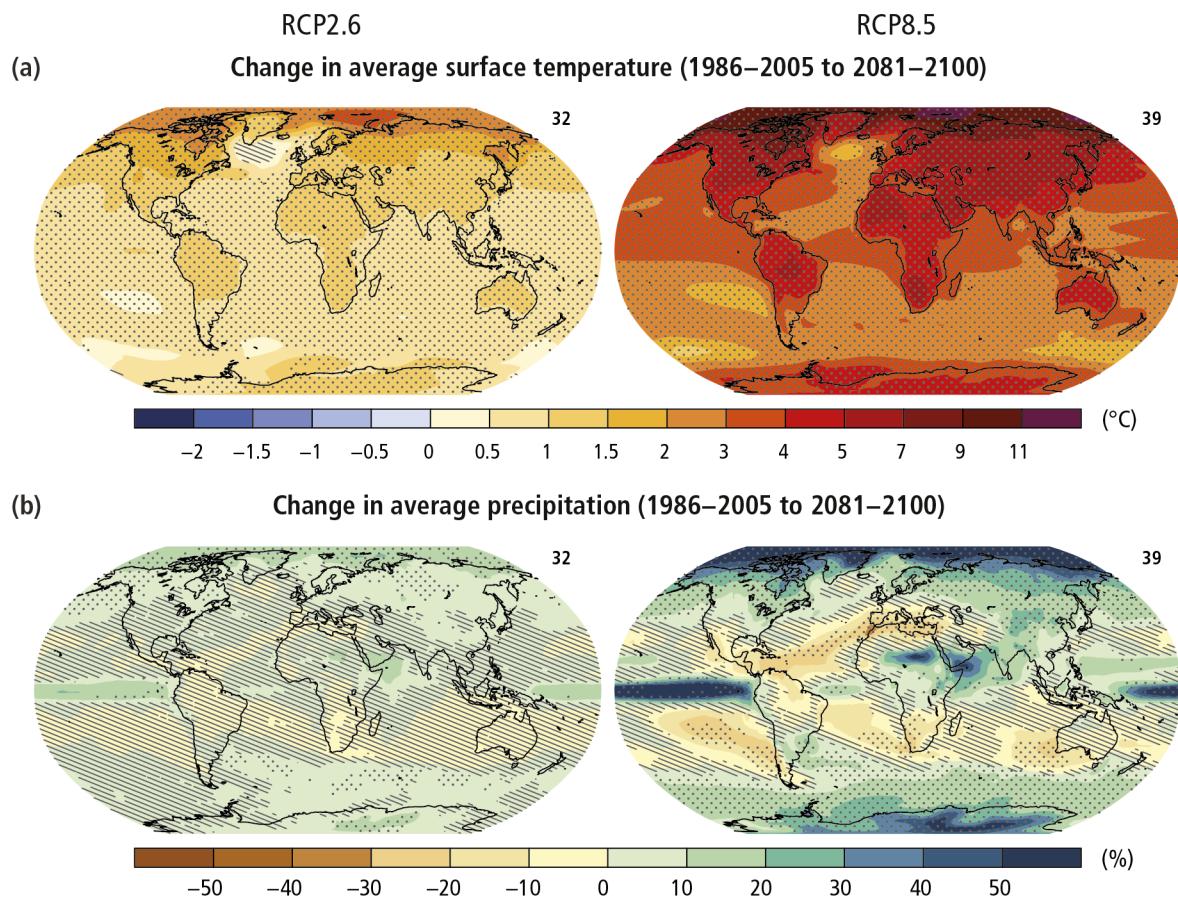


Figure 2 Change in average surface temperature (a) and change in average precipitation (b) based on multi-model mean projections for 2081–2100 relative to 1986–2005 under the RCP2.6 (left) and RCP8.5 (right) scenarios.

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

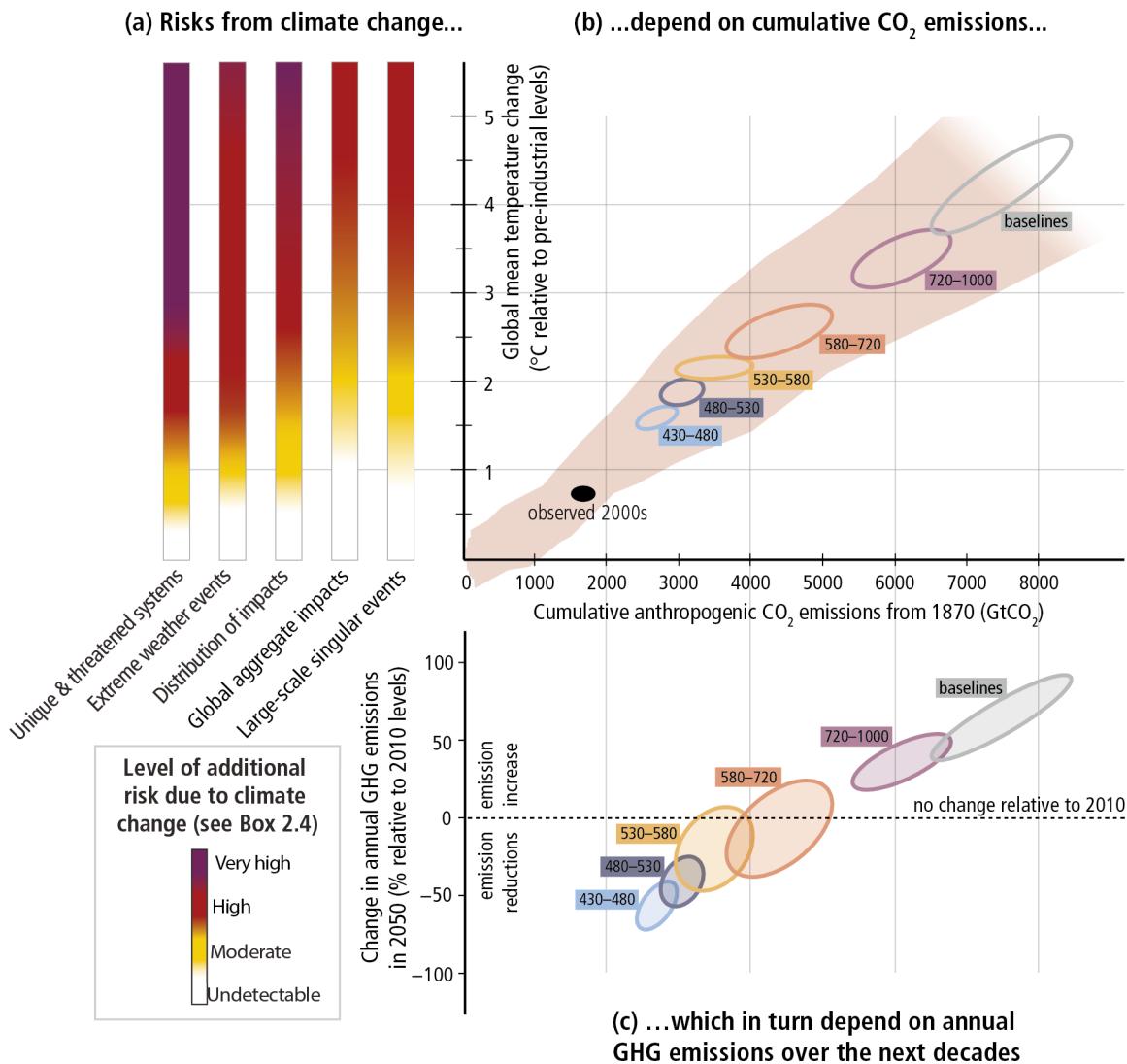


Figure 3 The relationship between risks from climate change, temperature change, cumulative carbon dioxide (CO₂) emissions and changes in annual greenhouse gas (GHG) emissions by 2050.

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.