

# Borough of Indiana Climate Action Plan



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

Approved by Borough of Indiana

2 February 2021

Resolution No. 2021 – R2

[www.indianaboro.com/sustainability](http://www.indianaboro.com/sustainability)

Produced by Planning and Zoning Department

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



# Credits and Acknowledgments

## Local Government Officials and Staff

- Indiana Borough Council
- Community Development Committee
- Nicholas Zimny-Shea, Planning and Zoning Official, Borough of Indiana

## External Agencies and Partners

- Joshua Andresky, Penn State
- Benjamin Burch, Temple University
- Heidi Kunka, Pennsylvania Department of Environmental Protection
- Calyn Hart, ICLEI – Local Governments for Sustainability USA
- Jesse Carpentier, ICLEI– Local Governments for Sustainability USA

## Community Stakeholders

- Greenhouse gas inventory presentation participants

## Plan Contributors

- Resilient Rural America Project pilot program
- Borough of Indiana Greenhouse Gas Inventory Presentation participants

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# Executive Summary

With seasonal variations and catastrophic natural disasters becoming more intense and frequent, climate change threatens the health, safety, and overall well-being of communities across the globe. The Commonwealth of Pennsylvania and the Borough of Indiana are no exceptions. The Borough of Indiana 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 Borough of Indiana'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 Borough of Indiana'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 Borough of Indiana's future resilience and will hopefully be a catalyst for developing a robust strategy towards that end.

- **Vision**

The Borough of Indiana is committed to promoting environmental integrity, economic vitality, and quality design standards to maintain the health, safety, and welfare of those within our community. The utilization of long-range planning techniques, plan implementation, and developmental review practices are active measures to aid the Borough in accomplishing its vision. Community wide visions for the Borough of Indiana are as follows:

- Transition into a community where people have access to multiple viable options for renewable energy production.
  - Transition into a community whose energy consumption sources have a low carbon intensity across the residential, commercial, and industrial sectors.
  - Transition into a community where people actively incorporate sustainable practices into daily actions.
- **Major findings from the jurisdiction's greenhouse gas inventory**

A greenhouse gas inventory was conducted from base year 2016 across multiple sectors within the Borough of Indiana. This included emissions from, transportation and mobile sources, solid waste, water

and wastewater, commercial energy, industrial energy, residential energy, and process and fugitive emissions. All greenhouse gas emissions were converted into their carbon dioxide equivalent (CO2e) to accurately account of the multitude of gases released that contribute to climate change. Figure 1 Below is a breakdown of the emissions by sector which in total added up to 194,039 MT of CO2e.

	Transportation & Mobile Sources	Solid Waste	Water and Wastewater	Commercial Energy	Industrial Energy	Residential Energy	Process & Fugitive Emissions
CO2e (MT)	7,887	4,872	545	49,964	75,373	53,876	1,522
Percentage	4%	2%	0.2%	26%	39%	28%	0.8%

Figure 1: Sectoral Emissions in Metric Tons

- **Projections of future emissions**

The Borough has forecasted emissions from base year of 2016 out to year 2050. Historically, the Borough of Indiana has seen a steady decline in population at a rate of approximately 0.7% annually. This results in a reduction of emissions from 2016 to 2050 which fall to approximately 155,000 MT of CO2e.

- **A summary of the actions within the plan**

**Sectors:** The Plan is organized by and addresses emissions from the three largest contributing sectors within the Borough of Indiana:

- Residential Energy
- Commercial Energy
- Industrial Energy

**Recommended Reduction Strategies:** The Plan identifies sector-specific reduction strategies to reduce overall emissions from implementation year to year 2050. The Borough of Indiana has identified 5 strategies to reduce emissions.

- Increase solar generation Borough wide
- Improve building efficiency
- Reduce carbon intensity of grid supplied electricity
- Reduce water consumption
- Community wide education on energy efficiency and sustainable practices

**Recommended Actions:** The identified strategies impact multiple sectors and are achieved through specific actions as follows:

- Increase solar generation Borough wide
    - Develop education plan to provide a cost benefit analysis identifying return on investment and emission reductions
    - Develop sector specific incentives to offset initial financial expenses
    - Utilize current programs to promote growth in solar installation Borough wide
  - Improve building efficiency
    - Establish a building energy evaluation program
    - Set commercial building retro-commissioning threshold
    - Set commercial building benchmarking threshold
  - Reduce carbon intensity of grid supplied electricity
    - Set carbon intensity reduction goals of grid supplied electricity
    - Provide education and support to foster sector involvement
  - Reduce water consumption
    - Conduct installed infrastructure analysis to identify system efficiency
    - Develop incentives to promote the use of low flow faucets and shower heads
  - Community wide education on energy efficiency and sustainable practices
    - Develop educational material and conduct community outreach
- **Alignment with the [Commonwealth of Pennsylvania’s 2018 Climate Action Plan](#).**

This Climate Action Plan intends to meet the reduction target outlined in the Commonwealth of Pennsylvania’s 2018 Climate Action Plan by setting an initial target at year 2025, intermediate target at year 2035, and end target at year 2050. Figure 2 illustrates both the targets set by the Commonwealth of Pennsylvania and the Borough of Indiana.

Year	Pennsylvania	Borough
2025	26%	26%
2035	-	50%
2050	80%	80%

Figure 2: Reduction Targets

# 1. Introduction

Climate change is the greatest environmental challenge of the 21st century, with overwhelming and growing evidence documented over the past decade. It poses a serious threat not just to the Borough of Indiana'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 Borough has an unparalleled opportunity to make changes in ways that create jobs and benefit all residents. Scientists expect that with the current trends in fossil fuel use, Americans may see more intense heat waves, droughts, rainstorms, floods, wildfires and landslides in the future. These impacts could drag down our economy, stress our natural resources and worsen inequities facing many Americans. Action is required at all levels, and local governments have a unique role to play in building low-carbon communities. In Pennsylvania, temperatures have increased by more than 1.8°F since the early 20<sup>th</sup> 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 20<sup>th</sup> century and is expected to increase by another 8% by 2050, with a 14% increase during the winter season (Shortle et al. 2015).

These impacts are caused by the accumulation of greenhouse gas (GHG) such as carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) in the atmosphere, primarily resulting from burning fossil fuels and land use changes. Although the natural greenhouse effect is needed to keep the earth warm, a human enhanced greenhouse effect with the rapid accumulation of GHG in the atmosphere leads to too much heat and radiation being trapped. Carbon emissions from human activities have continued to rise in recent decades, reaching the highest rates in human history between 2000 and 2010 ( Intergovernmental Panel on Climate Change (IPCC), 2014). About half of all carbon dioxide emitted between 1750 and 2010 occurred in the last 40 years. The energy, industry and transportation sectors have dominated the rise in emissions. In Pennsylvania, the sectors responsible for the most GHG emissions are industrial at 31%, electricity production at 30%, and transportation at 23% (Pennsylvania Department of Environmental Protection (PA DEP), 2019). With the current trajectory of population growth, urbanization, and reliance on personal vehicles, emissions will only continue to rise. Given the critical impacts of climate change on humanity, the time to act to reduce GHG and our carbon footprint is now.

In addition to national and state efforts to make systemic changes that will reduce global emissions, local governments can play a powerful role in addressing climate change. The design of American communities—

how we use our land, how we design our buildings, how we get around—greatly impacts the amount of energy we use and the volume of GHG emissions we produce. It is critical that communities like the Borough of Indiana demonstrate that it is possible to dramatically reduce GHG emissions while creating more vibrant and prosperous places to live and do business.

## Statewide Climate Action

In 2008, the Pennsylvania Climate Change Act was passed, and requires the Department of Environmental Protection (DEP) to (1) develop an inventory of GHG emissions and update it annually; (2) administer a Climate Change Advisory Committee; (3) set up a voluntary registry of GHG emissions; and (4) prepare a Climate Change Action Plan and Climate Impacts Assessment, both to be updated once every three years. The most recent Climate Impacts Assessment was updated in 2015, and the most recent Climate Action Plan, as well as greenhouse gas inventory, were released in 2019. These documents offer information and guidance for local climate action planning in the Commonwealth. The Climate Impacts Assessment provides a scientific basis for potential statewide impacts of global climate change, which can be used alongside available local data to inform community adaptation efforts. The PA Climate Action Plan summarizes statewide greenhouse gas emissions, sets an emissions reduction target, and describes potential mitigation and adaptation actions for residents and businesses, as well as local and state government. The reduction targets are 26% by 2025 and 80% by 2050 from 2005 levels, consistent with an executive order signed by Governor Wolf in 2019 (PA DEP, 2019).

To ensure consistency with the PA Climate Action Plan, the Borough of Indiana 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*.

## Local and Regional Climate Policy

### Relevant community information and programs:

- Walk friendly community
- Tree City USA
- Sustainable Pennsylvania

## Purpose and Scope of the Climate Action Plan

The Borough of Indiana is joining an increasing number of local governments committed to addressing climate change at the local level, in particular, through its support to improve on active measures identified in the

Sustainable Pennsylvania program to achieve the Borough's goals of emissions reduction, economic vitality, and environmental preservation. Along with a cohort of 19 other jurisdictions in the Commonwealth of Pennsylvania, the Borough of Indiana began the climate action planning process in 2019. College students were matched with staff from each jurisdiction and were trained by ICLEI USA on each component of the climate action planning process. They worked together to develop individual climate action plans. ICLEI's technical guidance was enabled via a grant from US Department of Energy State Energy Program through the PA Department of Environmental Protection.

The Borough of Indiana 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 Borough of Indiana needs to address existing climate risks such as increased heat stress occurrences, increased severe weather occurrences, deteriorating air quality, and flooding, while adapting its existing 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 Borough of Indiana for years to come.

## Purpose

By creating a clear course of action so that everyone has a role in creating and achieving climate and sustainability goals, our Climate Action Plan drives and coordinates local efforts toward a reduction in GHG emissions of 2016 levels by 26 percent by 2025, 50 percent by 2035 and 80 percent below 2016 emission levels by 2050.

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

In addition to addressing mitigation concerns, the Climate Action Plan considers the vulnerability of the Borough of Indiana 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 Borough of Indiana. It addresses the major sources of emissions in the

Borough of Indiana and sets forth objectives and actions in the following three sectors that both the Borough of Indiana and community members can implement together to reduce greenhouse gas emissions:

- Residential Energy
- Commercial Energy
- Industrial Energy

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 Borough of Indiana 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 Borough of Indiana’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.

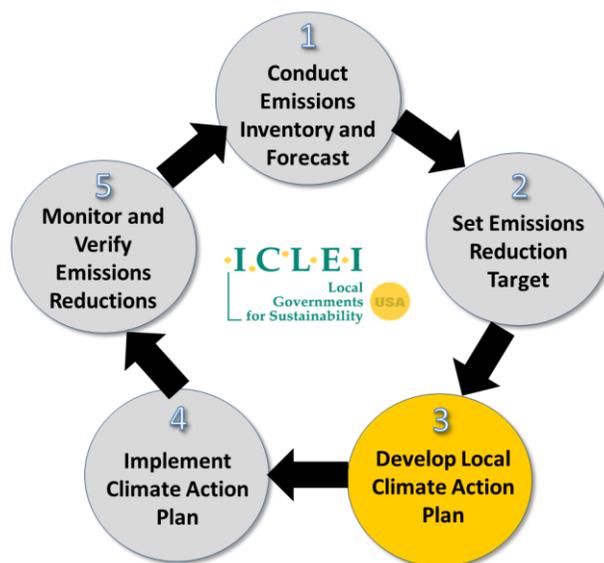


Figure 1: Five Milestones for Climate Mitigation

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 Borough of Indiana’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.

## Plan Development and Community Stakeholders

- **Planning and Zoning Department facilitated data collection and presentation of GHG inventory at a public meeting**
- **Communittee Development Committee guided public outreach and priorities for future actions**
- **Borough of Indiana Greenhouse Gas Inventory Presentaion, Borough Hall, 27 Febuary 2020 – Planning and Zoning Department presented the GHG Inventory and Completed a survey assessing participants reactions to Climate Change and energy use issues**

## Social Equity

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

Communities of color and low-income populations have historically been under-served by programs and investments and under-represented in decision-making, including for the development and implementation of climate policy. These exclusionary processes maintain or exacerbate disparities in public health; food, energy, and housing security; air and water quality; economic prosperity, and overall quality of life. These inequities primarily stem from ongoing institutional racial bias and historical discriminatory practices that have resulted in the inequitable distribution of resources and limited access to opportunities.

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

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

## Community-Driven Planning Process

The best practice for equitable planning is to have a community-driven process as described in the [Community-Driven Climate Resilience Planning: A Framework from the National Association of Climate Resilience Planners](#). The Borough will move forward with the GHG Inventory and this Climate Action Plan in order to engage the public in the planning process. These actions will be taken and informed by the following resources:

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

Potential methods and metrics that can be incorporated into the planning process moving forward include:

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

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

- The [Pennsylvania Department of Environmental Protection's Environmental Justice Viewer](#):
- Indiana Borough Community Development Committee
- Local environmental volunteer organizations

Borough of Indiana community-driven process included the following steps:

- The completion of a Greenhouse Gas Inventory Presentation Meeting
- Preparation of presentation materials for future public outreach

## Engagement Activities and Implications

- 27 February 2020 – Greenhouse Gas Inventory Presentation
- GHG presentation resulted in survey results that can be used to shape future actions and potentially help attract funding for mitigation and adaptation projects

## Vision Statements and Objectives

1. Make the Borough of Indiana a leader in clean and local energy that comes from the sun, wind, or other innovative renewable technologies.
2. Transform our buildings into high-performing places to live, work, learn, and play.
3. Ensure the benefits of climate action are equitably distributed and empower historically underserved populations to participate in the process of transitioning to a carbon-free community
4. Transform the Borough of Indiana into a community where people walk, bike, take mass transit, or carpool for most trips in a safe, accessible, and affordable transportation network.
5. Transition into a community where people actively incorporate sustainable practices into daily actions.
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. 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 Borough of Indiana established the following targets to maintain a vibrant, healthy, and safe community for future generations, while improving the quality of life for those who live here today:

### By 2025

- Increase residential solar generation capacity by 528 kW (approximately 2% of housing units)
- Increase commercial solar generation capacity by 2112 kW
- Increase industrial solar generation capacity by 2112 kW
- Reduce residential sectoral emissions by 23%
- Reduce commercial sectoral emissions by 19%
- Reduce industrial sectoral emissions by 16%

### By 2030

- Increase residential solar generation capacity by 1188 kW (approximately 5% of housing units)
- Increase commercial solar generation capacity by 4752 kW

- Increase industrial solar generation capacity by 4752 kW
- Reduce residential sectoral emissions by 40%
- Reduce commercial sectoral emissions by 47%
- Reduce industrial sectoral emissions by 36%
- 9% of Indiana Borough's commuters will carpool
- 8% of Indiana Borough's commuters will bike to work
- 9% of Indiana Borough's commuters will walk to work
- 20% of Indiana Borough's commuters will telecommute
- Electric Vehicles will be powered by 100% renewable energy
- Borough of Indiana will incentivize Leadership in Energy & Environmental Design (LEED) certification and/or enforce net-zero building codes for new buildings
- At least 30% of new housing units within ¼ mile of high-frequency transit are designated affordable.
- A food outlet selling fresh produce is located within a 15 minute walk of every resident
- An emergency cooling center is located within a 10 minute walk for the most vulnerable residents (based on age, income and other factors)
- 20% of jobs in transit construction and renewable energy installation are provided to residents of low-income neighborhoods, or groups that face employment challenges.
- Miles of bike lane per resident in low-income neighborhoods is equal to that in higher-income neighborhoods
- Increase annual number of households reached by low-income weatherization programs 30%
- Decrease the energy costs of low-income residents 20%
- Install roof-top solar on homes of 1000 low and moderate income residents

## By 2050

- Increase residential solar generation capacity by 3828 kW (approximately 17% of housing units)
- Increase commercial solar generation capacity by 15312 kW
- Increase industrial solar generation capacity by 15312 kW
- Reduce residential sectoral emissions by 51%
- Reduce commercial sectoral emissions by 60%

- Reduce industrial sectoral emissions by 47%
- 70% of Indiana Borough's households and businesses will participate in smart grid meter programs
- 90% of Indiana Borough's existing buildings will complete energy-efficiency improvements
- 50% of Indiana Borough's tenants will participate in a green lease program
- 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
- 18% of Indiana Borough's commuters will bike to work
- 15% of Indiana Borough's commuters will walk to work
- 18% of Indiana Borough's commuters will use public transit
- 100% of public transportation will be carbon free
- 80% of light-duty vehicles will be electric
- 100% of Indiana Borough's light- and heavy- duty vehicles will be electric or fueled by carbon-free fuel
- 100% of transportation network companies' cars (Taxis, Uber, Lyft, etc.) will be electric

### **Key results from Greenhouse Gas Inventory Public Meeting:**

Survey results from the Greenhouse Gas Inventory Meeting documented that most attendees which completed the survey were interested and had taken steps to reduce energy use or installed energy efficiency upgrades at their properties. Participants also cited cost as the primary barrier to completing efficiency upgrades and thought it was possible to exceed the state GHG reduction targets. The responses indicated that it was very important to take action to mitigate GHG emissions and adapt to climate change. GHG reduction ideas for the Borough included an electric lawn mower program, installing solar on municipal buildings, reducing food waste, and improving lawn care practices to reduce water use.

# 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 the Borough of Indiana’s residents. More transit options combined with transit-oriented development practices make for a more vibrant, livable community with shorter commute times and more opportunities for active transport. This creates more connected and resilient neighborhoods.

## 2. Saving Money and Reducing Risk

In addition to addressing climate change, measures taken to reduce greenhouse gas emissions have other important benefits. The most obvious of these is the potential for significant cost savings. In 2016, the Borough of Indiana spent over \$300,000 on energy to power buildings and fuel its vehicle fleet. Many of the measures in this plan pay for themselves quickly by reducing direct costs, such as fuel or energy used, and also indirect costs such as maintenance. For instance, a “right-sized” vehicle fleet is less expensive to purchase and fuel, while also being less costly to maintain. Increasing residential solar generation for approximately 30 housing units with a 4.4 kW solar array will create a total savings of approximately \$71,500. This replaces traditional energy generation sources with renewable technologies and reduces associated emissions. The same approach can be taken in the commercial and industrial sector by increasing solar generating capacity to 528 kW. This would create a savings of approximately \$184,274 for the commercial sector and \$124,400 for the industrial sector. Providing education on energy efficiency and sustainable practices can save the residential sector approximately \$158,844 based on 25% involvement. Encouraging energy efficiency, public transit use, building improvements, and other measures will also result in lower energy and water bills for residents and employers as well.

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

### 3. Enhancing Resource Security

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

Many of the actions identified here to mitigate GHG emissions will also help'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 Borough of Indiana, such service disruptions are less likely, and the Borough will be able to better cope with those situations. Similarly, climate actions can secure food and water sources and prevent damage and service disruptions to these systems from drought, flooding, and fire.

### 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 Borough of Indiana. Attracting a solar installer to open within the Borough is one example of how renewable energy will provide for future job growth the town.

### 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. Low-income households would be financially better off by reducing energy costs allowing them to have the ability to offset heating and cooling needs during sever weather conditions. 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, Borough of Indiana's planning process generated solutions that will both address climate change and ensure a better quality of life for communities of color and low-income communities.

# 3. Borough of Indiana'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.

Through the completion of a local emissions study, or “greenhouse gas inventory,” our Borough has determined emissions levels for the community as a whole. Community-wide emissions represent the sum total of emissions produced within the Borough of Indiana 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.

## Borough of Indiana Community-Wide GHG Emissions

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

## CO2e By Category

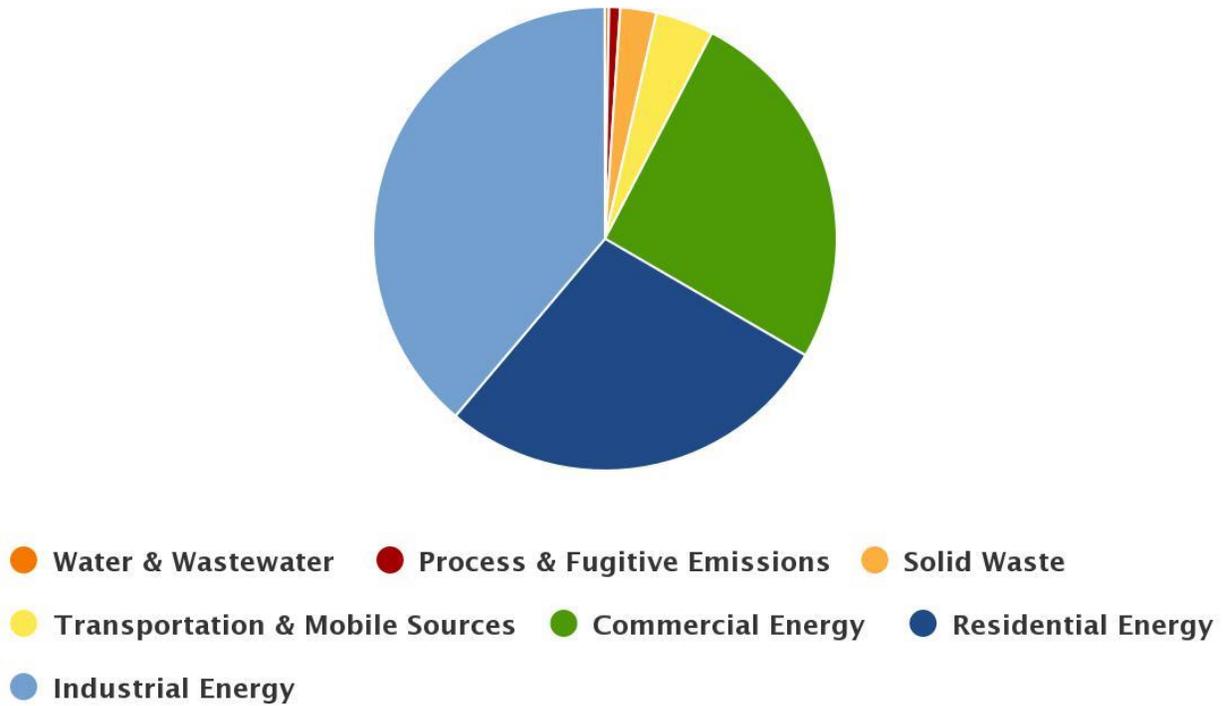


Figure 3: Borough of Indiana Community-Wide GHG Emissions

	Transportation & Mobile Sources	Solid Waste	Water and Wastewater	Commercial Energy	Industrial Energy	Residential Energy	Process & Fugitive Emissions
CO2e (MT)	7,887	4,872	545	49,964	75,373	53,876	1,522
Percentage	4%	2%	0.2%	26%	39%	28%	0.8%

Figure 4: Borough of Indiana Sectoral Emissions in Metric Tons

Government emissions include all sources for which the local government exercises direct operational control including transportation and mobile sources, solid waste, water and wastewater, commercial energy, industrial energy, residential energy, and process and fugitive emissions.

## Forecasting Borough of Indiana's GHG Emissions

The Borough of Indiana has also completed an emissions forecast based on projections of current data and expected future trends. This emissions forecast is the "Original" forecast (also known as a "Business As Usual" forecast), a scenario estimating future emissions levels if no further local action (i.e. projects within this Climate

Action Plan) were to take place. The forecast indicates that, if we do not take action, GHG emissions will continue to decrease based on a negative population growth.

### Projected Growth in GHG Emissions

Figure 5 shows the projected forecast of GHG emissions in the Borough of Indiana from 2016 to 2050. For complete information regarding the emissions inventory and forecast, including methodology and supporting data, please reference Appendix I.

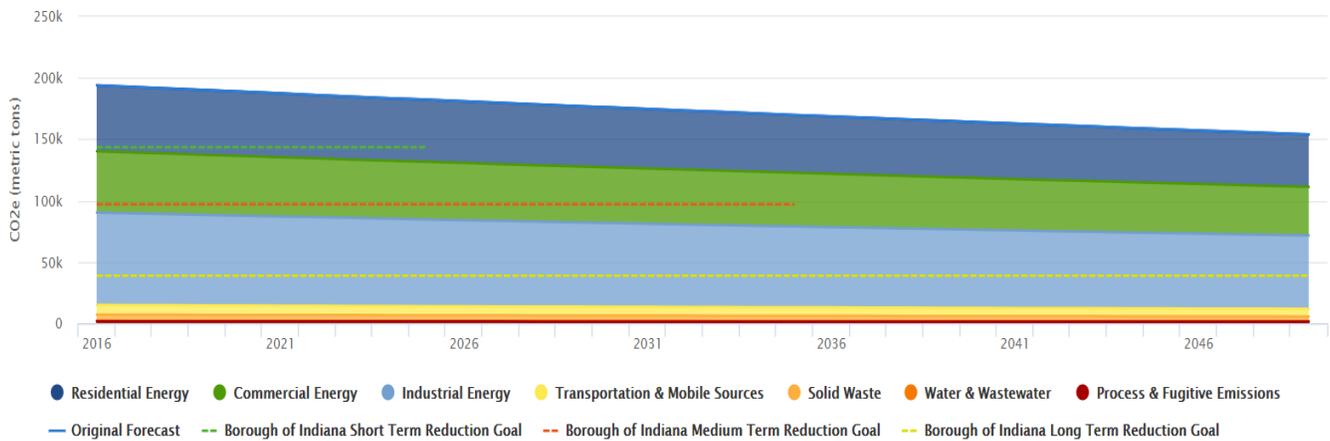


Figure 5: Projected Growth in GHG Emissions from 2016 to 2050

### Borough of Indiana’s GHG Reduction Target

The Borough of Indiana has set targets to reduce its emissions 80 percent below 2016 levels by 2050. Figure 6 compares the reduction target with the business-as-usual forecast. The combination of measures that the Borough of Indiana has already implemented, are currently planned, and are presented through this Climate Action Plan are designed to help achieve the 2050 targets. Reductions in 2050 rely on the best information currently available pertaining to population forecasts, future changes to building codes, and vehicle fuel efficiency standards among other information.

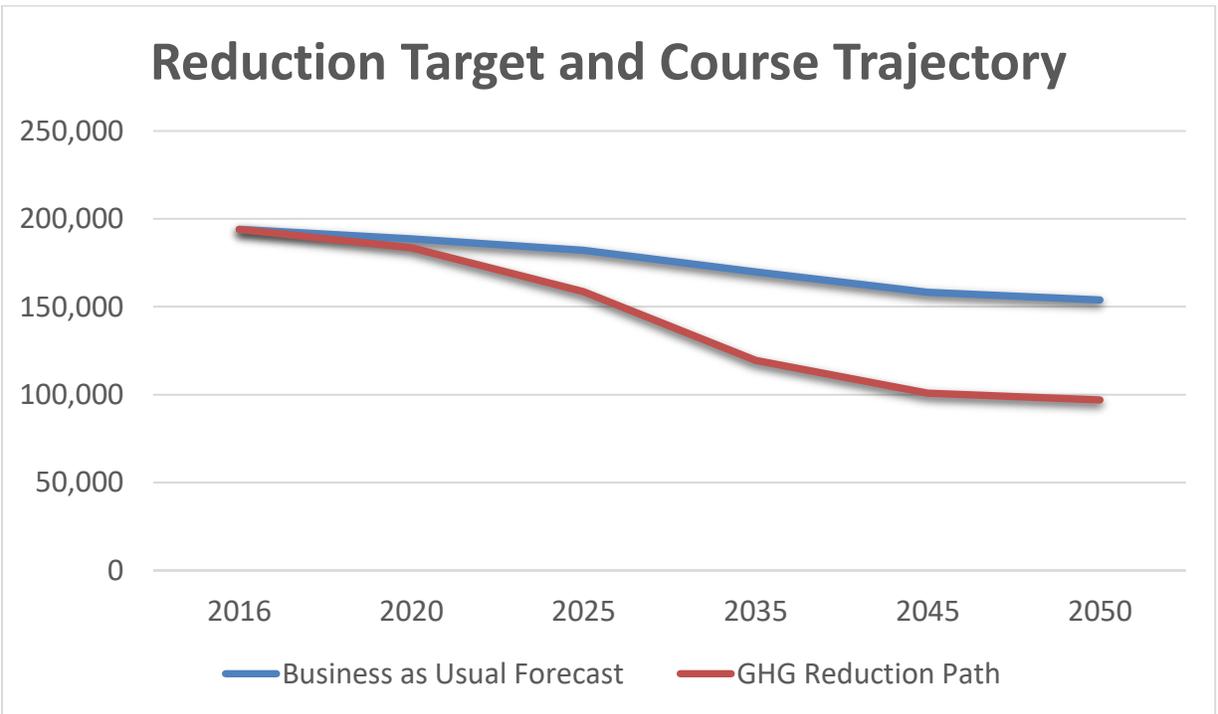


Figure 6: GHG Reduction Target CO2e MT (Metric Tons) by Year

The Borough of Indiana’s reduction target comes close to meeting 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 Borough of Indiana Climate Action Plan

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

While the local government cannot address climate change by itself, government policies and practices can dramatically reduce greenhouse gas emissions from a range of sources and help prepare the Borough of Indiana for the anticipated impacts of climate change. In addition, the Borough of Indiana will assist residents and businesses in their endeavors to reduce emissions through programs explained in this Plan. By working together, the Borough of Indiana can not only do its part toward achieving a stable climate - we can reap the benefits of healthier air, lower costs for utilities and services, improved transportation and accessibility, a more vibrant local economy, and many other positive side effects of reducing our carbon footprint.

Borough of Indiana Climate Action Plan Summary Table – Sectors

Sector	Description	Number of Distinct Actions	Anticipated MTCO2e Reduction by 2050	Percentage of Total Reduction at 2050
Residential Energy	Policies and programs to reduce residential sector energy use.	4	~27,843	51%
Commercial Energy	Policies and programs to reduce commercial sector energy use.	4	~30,304	60%
Industrial Energy	Policies and programs to reduce industrial sector energy use.	2	~35,810	47%

\*MTCO2e (Metric tons of CO<sub>2</sub> equivalent)

The Impact on Emissions

The figure below depicts historic GHG emissions, forecasted growth in emissions, and target emissions from 2016 to 2050. The color wedges represent the projected reductions in emissions based on state and local programs.

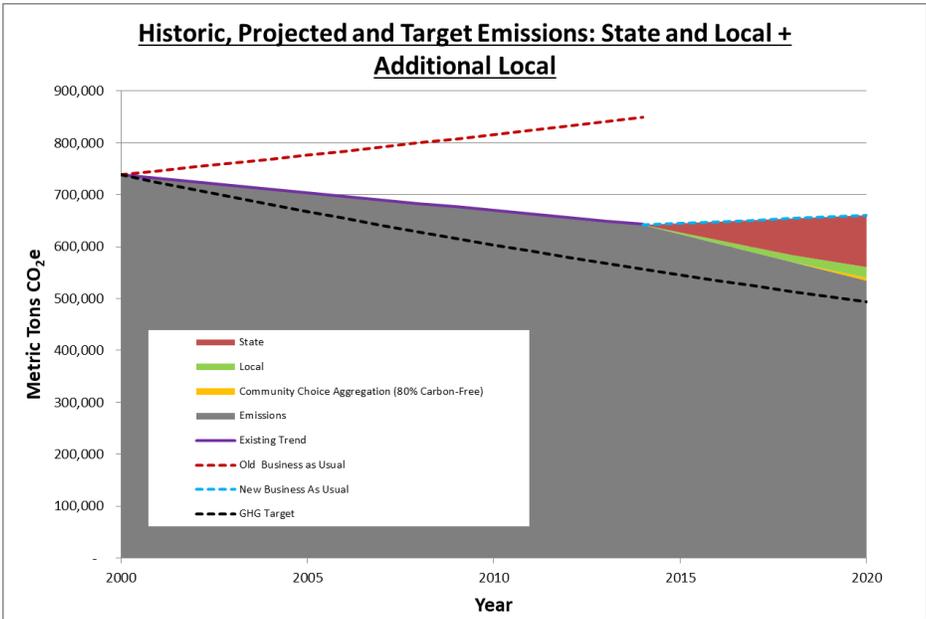


Figure 7: Visualizing GHG Reductions

# 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 several years into the future. The uncertainty associated with these assumptions makes it difficult to assign exact reduction totals to each objective or action. To address this uncertainty and provide a simple but useful reference for reduction potential, a series of symbols and percentage ranges has been devised to represent the emission reductions associated with each objective and its actions:

Symbol	GHG Reduction
	0-10%
	11-20%
	21-30%

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

## Evaluating Co-Benefits

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

Symbol	Co-Benefit
	Supports jobs and economic prosperity
	Advances social equity
	Fosters resource security
	Improves public health and local environmental quality

## Supporting Actions

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

## New and Existing Actions

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

## Consistency with Statewide Climate Action Plan

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

## Climate Adaptation

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

# Specific Actions Establishing Statewide Climate Action Plan Consistency

- **Increase end use energy conservation and efficiency**
  - Update building codes
  - Increase adoption of energy efficiency
  - Expand energy assessments and provide more trainings on energy efficiency for industry
  - Expand home weatherization programs
  - Increase support for market trends for energy efficient technologies
  - Replace high carbon and GHG producing fuels or energy sources with less environmentally impactful options
  - Educate consumers about the benefits of occupant performance and low energy usage improvements in building system technologies
- **Implement sustainable transportation planning and practices**
  - Reduce vehicle miles traveled for single-occupancy vehicles
  - Implement a strategic plan and incentives for increasing electric vehicle use
  - Increase the use of clean public transportation through electric municipal bus fleets
  - Develop people-mover systems, such as West Virginia University's Personal Rapid Transit system
  - Continue and expand efforts to assess climate risks to transportation and land use planning, and incorporate expected future conditions into capital planning, project design, and routine operations, maintenance, and inspection practices
  - Improve preparedness for increased frequency of extreme events by improving coordination between agencies and other stakeholders and by improving real-time monitoring of flooding, traffic, and other conditions
  - Prioritize transportation and land use planning that promotes efficient use of public resources, reduces congestion, and minimizes GHG emissions through multi-modal transportation networks and compact, transit-oriented development that uses smart growth practices and complete streets
  - Educate citizens and business on the benefits of transportation demand-side management measures and clean and efficient transport options
  - Increase adoption of people-powered transportation options such as walking, school buses, or commuter bicycle paths
  - Reduce non-CO2 emissions (hydrofluorocarbons) from truck and stationary refrigeration systems
  - Help develop and implement regional market-based policies that would both reduce carbon pollution from the transportation sector and fund clean transportation investments

- **Develop, promote, and use financing options to encourage energy efficiency**
  - Expand use of performance contracting
  - Create local clean energy tax incentives
  - Evaluate options for and engage in public-private partnerships and capitalize on them
  - Encourage broad implementation of recent commercial PACE legislation
- **Increase use of clean, distributed electricity generation resources**
  - Invest in and promote building-scale solar
  - Incentivize and increase use of combined heat and power (CHP)
  - Support community solar legislation and develop model local ordinances
- **Create a diverse portfolio of clean, utility-scale electricity generation**
  - Further increase local generation and use of renewables
  - Establish a workgroup to help optimize siting of renewables, and to review and streamline permitting and regulations at the local level. Focus on high value, implementable actions such as community choice aggregation and battery storage.
- **Increase production and use of alternative fuels**
  - Increase recovery and use of gas from coal mines, agriculture, wastewater, and landfills for energy
  - Increase sustainable biofuel production
  - Support the sustainable harvest and use of biomass feedstocks for thermal energy
- **Use agricultural best practices**
  - Increase adoption rate of and provide training for no-till farming practices
  - Facilitate information sharing networks for farmers and the agricultural research community to share experiences and best practices
- **Protect ecosystem resilience, including forest systems where species will shift**
  - Conserve and enhance areas representing the full range of wildlife and fish habitats and promote connectivity (e.g., using land exchanges, conservation easements, leases; by removing barriers) to allow species to migrate to suitable habitat
  - Promote forest conservation, reforestation and urban tree canopy expansion on private and public lands through various means, including forest conservation easement programs
  - Restore wetlands and riparian areas, expand or revise current minimum riparian buffer zones, and implement living shoreline programs to provide natural flood abatement, breeding habitat, and improved stream conditions (including improved thermal conditions)
  - Preserve and create open spaces, parks, and trails that allow people to continue to engage in outdoor activities and maintain connectivity to natural resources. Protect wildlife and fish habitat and species that support recreational opportunities like hunting, fishing, and wildlife viewing.

- Educate recreational land users about the importance of climate change impacts on ecosystems and the dangers of illegal hunting and fishing, pollution, and development
- Retrofit existing parks and trails and create new parks and trails to strengthen the community, improve habitat connectivity, provide more water sources for human users recreating in higher temperatures, enhance natural stormwater and flood management, and connect paths to schools, workplaces, and retail centers to promote pedestrian use
- Promote alternatives to mowing, including meadows, native plants, and trees
- **Monitor, identify, and address ecosystem vulnerabilities**
  - Identify and prioritize species, habitat, and ecosystems most vulnerable to climate change and other stressors to better target protection and management actions
- **Help the outdoor tourism industry manage shifting climate patterns**
  - Help public parks adapt to climate change by designing park infrastructure to be adaptable to changes in use, allocating funds to match recreation demand, and expanding operations at ski resorts to allow for warmweather recreation
  - Explore developing new collaboratives with surrounding communities
  - Create a business ombudsman or technical assistance center for affected recreational industries and establish a source of grant funding or tax incentives to help industry and municipalities transition from winter to summer activities
- **Reduce waste generation by citizens and business thereby reducing waste sent to landfills, and WTE facilities, and expand the beneficial use of waste**
  - Implement programs to encourage citizens and business to reduce waste (including food waste) and use recycling and composting programs through reduce, reuse, and recycle actions
  - Encourage the use of digesters for methane capture and recovery
  - Support solar projects on landfill land
- **Use stormwater best management practices**
  - Explore ways to incorporate PA DEP’s Stormwater Best Management Practices Manual as standard operating procedure
  - Provide incentives for the installation and use of gray water and rainwater harvesting and consider existing international guidelines for increased reclaimed, recycled, and gray water use for non-potable applications (e.g., irrigation, toilet flushing)
  - Promote green infrastructure by instituting laws, regulations, and local ordinances requiring implementation of green infrastructure with new development or substantial redevelopment
  - Reduce impervious surfaces by requiring installation of permeable surfaces, buffers, and vegetated filters for all transportation-related projects; developing and enforcing a stormwater retention standard for new development and redevelopment; and/or implementing a fee for impervious surfaces
- **Promote integrated water resources management and water conservation**

- Assess the impact of climate change on critical water supply and wastewater infrastructure, and encourage the development of facility-specific adaptation plans
- Include climate change projections and modeling results in water supply and water quality planning to enhance reliability, improve quality, and improve instream flows and fish passage
- **Improve reliability and accessibility of public information about climate-related health risks**
  - Update Community Health Assessments to include climate change and health tracking metrics
  - Help local health departments assess their capacity to respond to health threats and to integrate climate preparedness into their hazard response plans and daily operations
  - Work locally with vulnerable groups to assist at-risk communities with the development, adoption, practice, and evaluation of response, evacuation, and recovery plan
  - Regularly map locations of vulnerable populations and use the information to focus interventions and outreach
- **Bolster emergency preparedness and response**
  - Review existing emergency response, preparedness, evacuation, and management plans
  - Expand the scope of the local hazard mitigation plan to factor in expected vulnerabilities from climate change impacts
  - Evaluate and improve the adequacy, effectiveness, accuracy, and technological capabilities of forecasting, earlywarning, and emergency-preparedness systems
  - Foster collaboration between communication service providers and agencies to provide reliable communications in times of power outages and emergencies
  - Establish heat advisories, increase availability of cooling stations, invest in efficient HVAC systems at targeted Recreation Centers which are provided with renewable energy backup systems, and implement other preventive measures to reduce the impact of extreme heat events
  - Restructure disaster-recovery policies to ensure that redevelopment efforts strive to reduce long-term risk
- **Lead by example in local government practices and assets**
  - Establish a strategic energy management plan for public facilities that includes benchmarking and specific energy, water, and transportation emissions reductions targets and goals
  - Maximize onsite renewable energy generation and purchase additional renewable power through renewable energy certificates (RECs) direct purchasing
  - Incorporate climate change considerations into decision making processes and criteria. For example, add climate change resilience as a prioritization factor for new capital projects.
  - Consider ENERGYSTAR certification, Leadership in Energy and Environmental Design (LEED) Gold, Net Zero Buildings, Zero Energy Codes, Passive House standards, and climate resilience design guidelines as higherperformance basis of design for new construction and major renovation projects in public buildings

- Inventory public buildings and energy use patterns to identify savings opportunities
  - Implement emissions reduction and climate resilience activities in public facilities, including distributed generation, least impact backup power generation, energy efficiency, water efficiency, climate resilient vegetation, and proper tree maintenance
  - Require energy efficient and alternative fuels use in fleet vehicles and equipment
  - Conduct more training, education, and outreach for facility managers and the workforce
  - Ensure that key government operations have planned to provide least impact backup power supply on-site to protect important security features in the case of more frequent or prolonged blackouts
- **Incorporate historical and projected climate conditions into siting and design decisions for longterm infrastructure**
    - Implement new or modified policies (e.g., zoning regulations, tax incentives, and rolling easements) that encourage appropriate land use and reduce repetitive losses

# 5. Commercial Buildings

Energy consumed in commercial buildings and industrial processes account for 65% of Borough of Indiana’s total GHG emissions. Improving the efficiency of our commercial building stock and reducing the energy intensity of the local industrial sector will contribute significantly to achieving the Borough of Indiana’s greenhouse gas reduction target. This chapter focuses on opportunities to retrofit existing commercial and industrial buildings and to ensure that future activities in these sectors are compatible with our community’s climate protection goals.

Objective	Supporting Actions	Co-Benefits	Reduction Potential
CB 1 – Retrofit existing commercial and industrial buildings to reduce emissions by 133 MTCO <sub>2</sub> e by 2050	RB 1, EP 1		
CB 2 – Ensure new commercial and industrial construction is built to maximize energy efficiency	CB 1, RB 2		
CB 3 – Increase commercial solar generation capacity to 15312 kW by 2050	CB 1D		
CB 4 – Increase Industrial solar generation capacity to 15312 kW by 2050	CB 1D		
CB 5 – Benchmarking of commercial buildings to reduce emissions by 20 MTCO <sub>2</sub> e by 2050	CB 1B		
CB 6 – Reduce carbon intensity of grid supplied electricity by 2.5% per year through 2050.	CB 1		

## Objective CB1 – Existing Commercial and Industrial Buildings

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



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
CB-1A	Partner with local utility companies to ensure commercial properties maximize use of energy efficiency rebate programs	N	Y			Community and Buildings Dept	Number of partnerships
CB- 1B	Require benchmarking and disclosure of energy use in commercial and industrial buildings over 10,000 square feet	N	Y			Utility, Bldgs & Finance Dept	Number of buildings using benchmarking
CB-1C	Establish PACE program and/or partner with utilities to offer on-bill financing for commercial energy efficiency retrofit projects	N	N			Utility, Bldgs & Finance Dept	Number of PACE projects
CB-1D	Establish solar integration program or partner with solar providers to incentivize installation of solar generation applications	N	Y			Utility, Planning, & Finance Dept	Number of solar integration programs

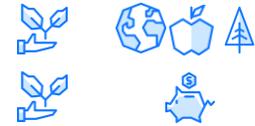
# 6. Residential Buildings

Energy consumed in residential buildings accounts for 28% of the Borough of Indiana’s total GHG emissions. Improving the efficiency of our residential building stock will contribute significantly to achieving the Borough’s greenhouse gas reduction target, while saving residents money on utility bills and reducing the need for new infrastructure. This chapter focuses on opportunities to retrofit existing residential buildings, increase the quality of new construction, increasing solar generation capacity, 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 – Provide education on energy efficiency and sustainable practice for 100% of housing units by 2024	RB 1, RB 2		
RB 2 – Increase residential solar generation to achieve a 17% penetration of housing units by 2050	RB 1D		

## Objective RB 1 – Existing Residential Buildings

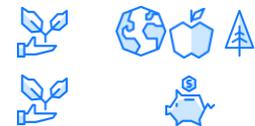
Retrofit existing residential buildings and homes to achieve a 51% reduction in emissions from energy use by 2050



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

## Objective RB 2 – New Residential Buildings

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



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
RB-2A	Improve building codes to exceed minimum efficiency requirements by XX%	N	Y	Y		Community and Buildings Dept	Number of homes weatherized

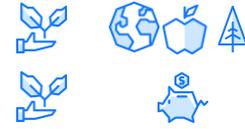
# 7. Energy Production

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. Emissions from fossil fuel combustion for energy, including transportation, represent the majority of the community’s total GHG emissions. Energy Production is a cross-cutting sector in that nearly all activities that take place in the community require energy of some sort. While electricity providers are working hard to increase the percentage of electricity generated through renewable sources, opportunities also exist for citizens and the Borough of Indiana 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 – Enhance support to residents for installing small-scale renewable energy systems	CB 1, RB 1		
EP 2 – Supply 100% of Indiana Borough’s local government electricity demand via local renewable generation	CB 1		
EP 3 – Promote local production of biofuels and harness waste energy	WR 1, WW1		

## Objective EP 1 – Small-Scale Renewable Energy Systems

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



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

## Objective EP 2 – Local Renewable Generation for Borough of Indiana

Supply 100% of Borough of Indiana local government electricity demand via local renewable generation



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

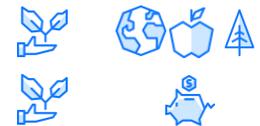
# 8. Waste, Composting, & Recycling

The Borough of Indiana’s solid waste is disposed of, primarily, at Evergreen Landfill. Emissions from decaying putrescible material directly contribute 3.7% of Borough of Indiana’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 Indiana Borough’s long-term interest to reduce waste at its source, expand recycling facilities, reduce food waste, and enable re-use of materials. This chapter focuses on opportunities to reduce waste, reuse materials, and recycle what cannot be reused.

Objective	Supporting Actions	Benefits	Reduction Potential
WR 1 – Reduce solid waste generation by 20% by 2025	CB1, RB1		

## Objective WR 1 – Reduce Solid Waste

Reduce solid waste generation by 20% by 2025



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

# 9. Water & Wastewater Management

The Borough of Indiana owns a wastewater treatment plant that incorporates methane digesters in order to reduce energy consumption and increase efficiency. The Borough has pursued a diverse set of energy efficiency improvements to this facility, including upgrading lighting to LED's and evaluating the feasibility of renewable energy deployment at the site. The borough is also completing a major testing and repair program of its wastewater conveyance systems that will reduce the inflow and infiltration of storm water into the sanitary sewer lines. This repair work will reduce the volume of water that is processed and reduce the associated GHG emissions from water treatment. Decreasing the electric usage at this facility will significantly decrease government operations impacts of greenhouse gases because it is the largest consumer of electricity at government facilities.

Objective	Supporting Actions	Benefits	Reduction Potential
WW1 – Upgrade the energy efficiency of water delivery and treatment systems by 30%	CB 1, RB 1		
WW 2 – Increase renewable energy usage on site	CB 1		
WW3 – Evaluate Renewable Energy usage throughout conveyance system through micro-hydro electric generation	WR 1, WW1		

## Objective WW1 – Energy Efficiency

Upgrade the energy efficiency of water delivery and treatment systems by 30% by 2025



Action Number	Action	New (N) or Existing (E)	Statewide CAP Action	Reduces Climate Risk	Co-Benefits	Lead Actor	Metric
WW -1A	Upgrade the mechanical and electrical systems at Wastewater Treatment Plant	N	Y	Y		Wastewater Treatment Facility	Number of systems upgraded
WW- 1B	Repair wastewater conveyance lines	E	N	Y		PW Dept	% of decrease in flow

# 10. Transportation

Emissions from transportation is a common sight to nearly everyone in the Borough. Besides emitting greenhouse gases, transportation fossil fuels also produce a host of criteria air pollutants when combusted, reducing local air quality and affecting our health. Transportation accounts for 6% of Indiana Borough’s total GHG emissions. This chapter focuses on programs and policies to reduce emissions from transportation and includes design-oriented approaches as well as expansion of alternate modes such as walking, biking, or public transportation to and from the most common destinations in or around town.

Objective	Supporting Actions	Benefits	Reduction Potential
TR 1 – Reduce vehicle miles traveled by single-occupancy vehicles by 15% by 2025	CB 1, RB 1		
TR 2 – Electrify all municipal fleet and buses by 2050	CB 1		
TR 3 – Build electric vehicle accommodations into development requirements	WR 1, WW1		

Current Rapid Response Potential:

The recent transportation changes associated with COVID-19 have encouraged residents to walk, bike and run more frequently and this kind of community behavioral change can be encouraged by establishing multimodal paths. Encouraging the continued development of sustainable transportation will reduce the Borough’s GHG emissions related to the transportation sector. In addition, increases in remote work will contribute to decreased emissions from several sectors of the economy and could be encouraged.

# 11. Agriculture & Forestry

Indiana Borough is a Tree Friendly City and operates a Shade Tree Commission. Protecting the tree cover in and around town is recognized as a valuable part of the community’s image, stormwater mitigation efforts, and intent to be a welcoming and sustainable community. The town and surrounding county have been the self-proclaimed the Christmas capital of the world for many decades because much of the farm land is on steep slopes that make many crops difficult to harvest. Indiana Borough can evaluate how this legacy could be adjusted moving into the future in order to improve the sustainability of the community.

Objective	Supporting Actions	Benefits	Reduction Potential
AG 1 – Codify the benefits of tree cover to stormwater mitigation	CB 1, RB 1		
AG 2 – Work with neighboring communities to preserve local forests and recreational areas	CB 1		

# 12. 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. The Borough of Indiana participated in the Resilient Rural America pilot program and complete some elements of a climate vulnerability and adaptation assessment in 2019. The following basic review and 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 20<sup>th</sup> 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 Borough's participation in the Resilient Rural America Pilot Project helped identify many of the anticipated climate change impacts that are possible over the next thirty years. This strategic planning and climate change adaptation project helped the Borough establish what information can be used to inform and work with public in the planning process. Some of the tools that were used to make these assessments included the following:

- [U.S. Climate Explorer](#) provides locationally specific projections for temperature and precipitation in the form of exportable charts
- [Temperate](#) is a license-based software that identifies top hazards for your community based on the National Climate Assessment, and allows you to view, customize, and download projection charts. A Temperate license also includes features to help your community do a comprehensive vulnerability assessment and build an adaptation strategy.

Moving forward with the Planning and Zoning Department will incorporate the following resource:

- [Pennsylvania Climate Impacts Assessment Update](#) includes projections for the whole commonwealth, and breaks down some information by region.

## Current Community Concerns and Impacts

The Borough of Indiana used these resources to identify likely changes from today through 2050 and beyond. The impacts of climate change on Indiana are not limited to the future, we are experiencing the results today and increases in precipitation have exposed long term deficiencies within our wastewater and stormwater infrastructure which require immediate action. The wastewater system has been overwhelmed by the amount of rainwater that enters from storm events and resulted in action being taken to repair wastewater conveyance lines. At the same time, the stormwater management systems of the Borough have been overwhelmed during extreme events, for instance there were 2 one-hundred year floods within 3 weeks of one another during 2017 and this increase in stormwater also requires immediate action. Neither of these major infrastructure projects would be as pressing if it were not for the increases in precipitation. These challenges are incurring costs on limited resources today and require today, not in the future. It is because of the current effects, that

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 2090, which could impact agriculture, public health, and other sectors of the community

**This graph is from U.S. Climate Explorer.**

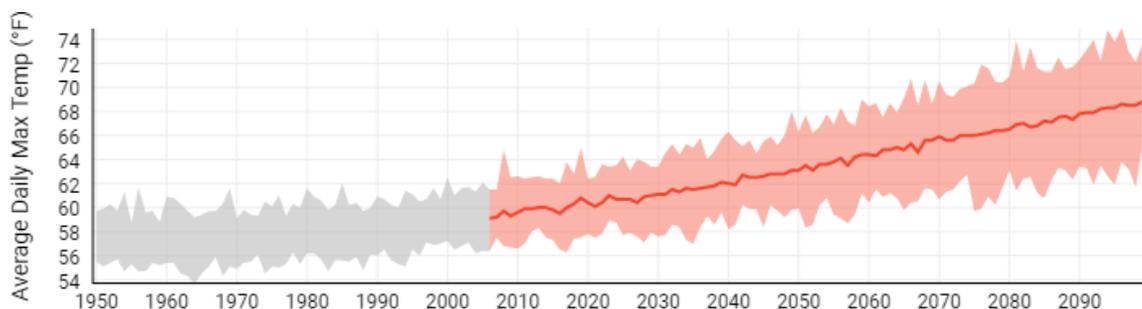


Figure 5: Average Daily Temperature Between 1950–2090

## 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
- Water efficiency and conservation actions can (1) reduce pressure on the grid from energy used for pumping, treating, and distributing water, and (2) make the community less vulnerable to drought

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

Action	Extreme Temperatures	Flooding	Drought	Seasonal Variations	[Other Hazard]
XX-1A EXAMPLE	X		X		

# 13. Monitoring Plan

Starting in December, 2020, the Borough of Indiana will engage with community members, businesses, institutions, and other stakeholders through a Climate Action Planning Task Force to take the current work completed through this project and apply it moving forward. In anticipation of a more complete planning process, the following steps have been outlined that can be followed:

Next Step Actions include:

- Creating citizen advisory groups for programs that require considerable community engagement.
- Making necessary changes to local policies or existing programs, including staffing.
- Submit data requests for 2017 through 2020 for GHG inventory update
- Schedule a set number of public meeting, viratually or in person if possible, and go big on raising the public interest and awareness of climate change and the Borough’s Climate Action Plan

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

The table below describes the components of the monitoring reports. Action reports are to occur every two years and will only include status updates on the overall action, the mitigation action plan, and the adaptation action plan. The full monitoring report will occur every year and additions to the components in the action report will occur every 3 years. The full update will include an updated community and municipal GHG inventory. This will help the Borough track its GHG emissions reduction progress. With the approval of this Climate Action Plan in 2020, the first monitoring action report will be due in April 2021 and the first full monitoring report with the updated GHG inventories will be due in 2023. The Borough will establish an expectation from utilities for yearly updates in order to assess progress and seek funding.

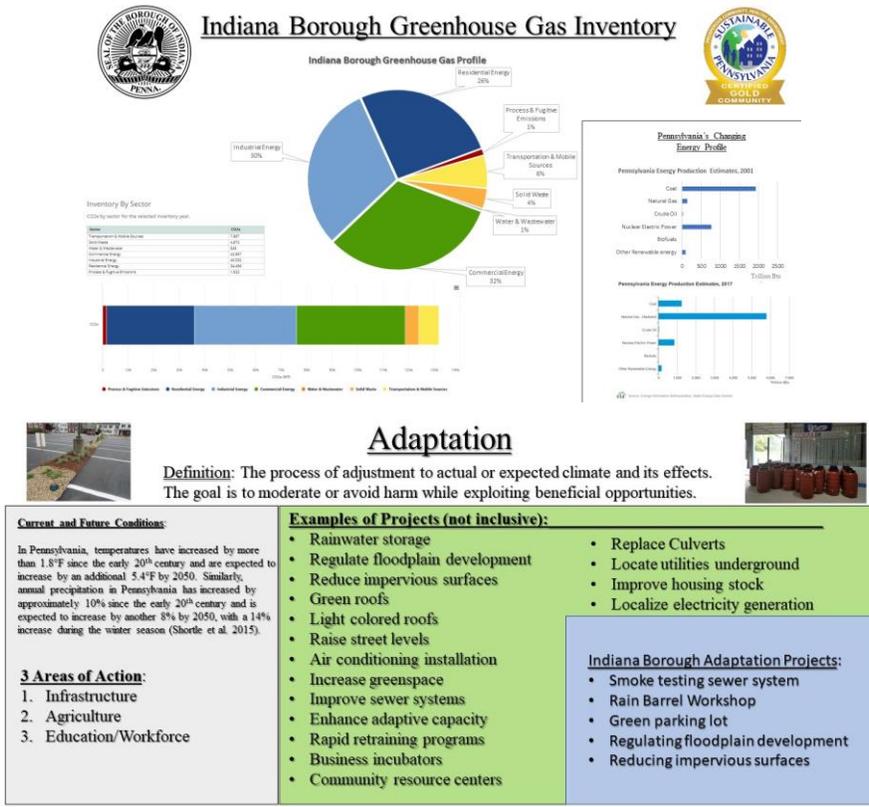
Monitoring Report Component	Action Reporting	Full Reporting
<b>Overall Action:</b> Reporting any changes to initial action as well as updated information on human and financial resources	Yes	Yes
<b>GHG Emissions Inventories:</b> Provide updated energy consumption and GHG emissions data for the reporting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

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# Appendix I: Methodology

## Public Greenhouse Gas Inventory Meeting Posters:



Please use post-it notes to contribute your ideas and post them below:

### Mitigation

**Definition:** Mitigation involves reductions in human sources of greenhouse gas's and the creation of carbon sinks.

- Types of Projects (not inclusive):**
- Renewable Energy
  - Multimodal Transportation
  - Energy Efficiency
  - Regenerative Agriculture
  - Greenspace and tree planting



- Current Indiana Borough Projects:**
- Solar Co-op
  - SolSmart Designation Community
  - Hoodlebug Trail Extension and Trailhead
  - Shade Tree Plantings
  - Hybrid Gas-Electric Vehicle
  - Electric Vehicle Charger
  - Solar stop signs
  - Supporting recycling programs

Please use post-it notes to contribute your ideas and post them below:

# 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).

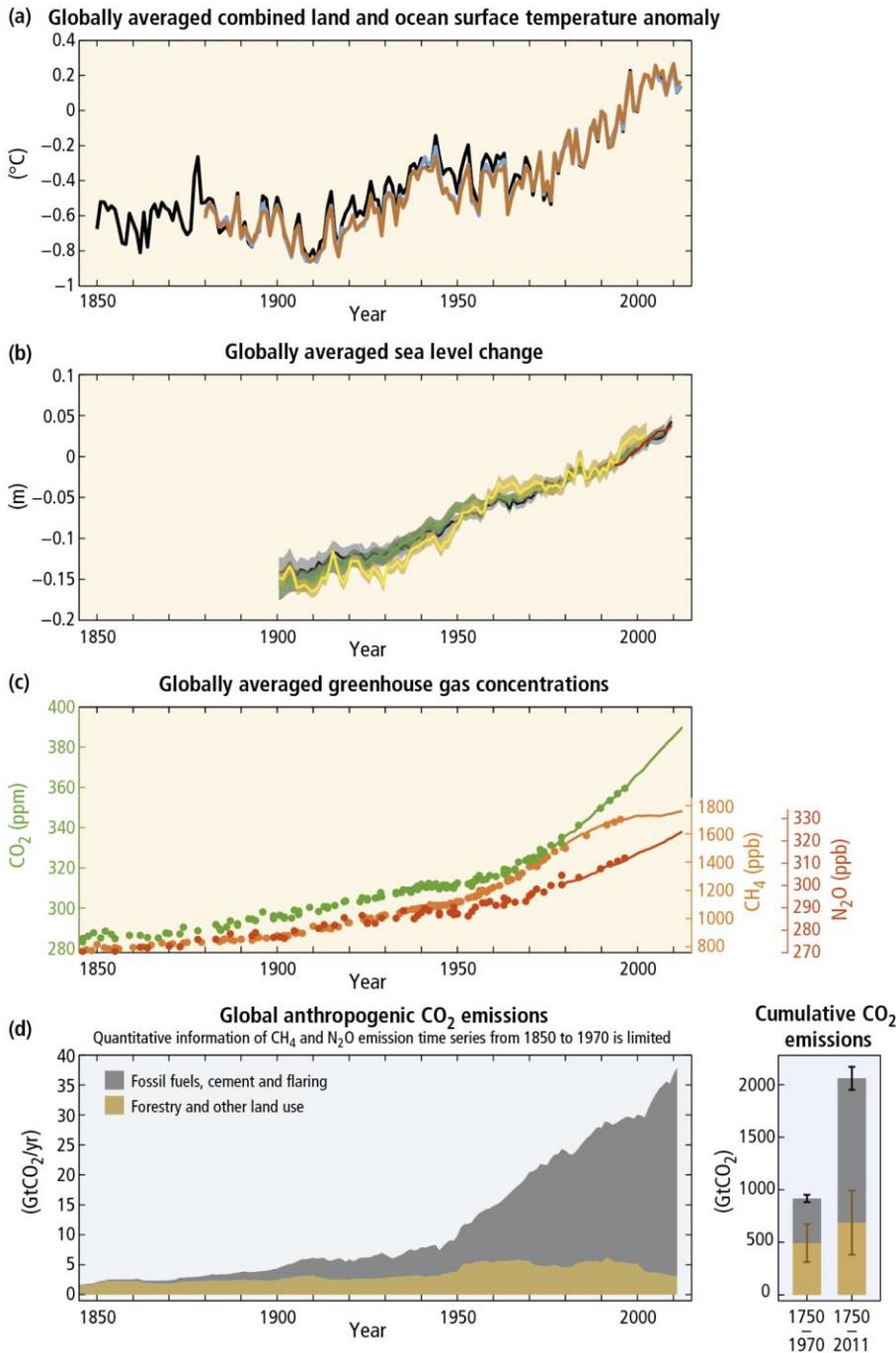


Figure 1 Observations and other indicators of a changing global climate system

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 forces together. Globally, economic and population growth continued to be the most important drivers of increases in CO<sub>2</sub> 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

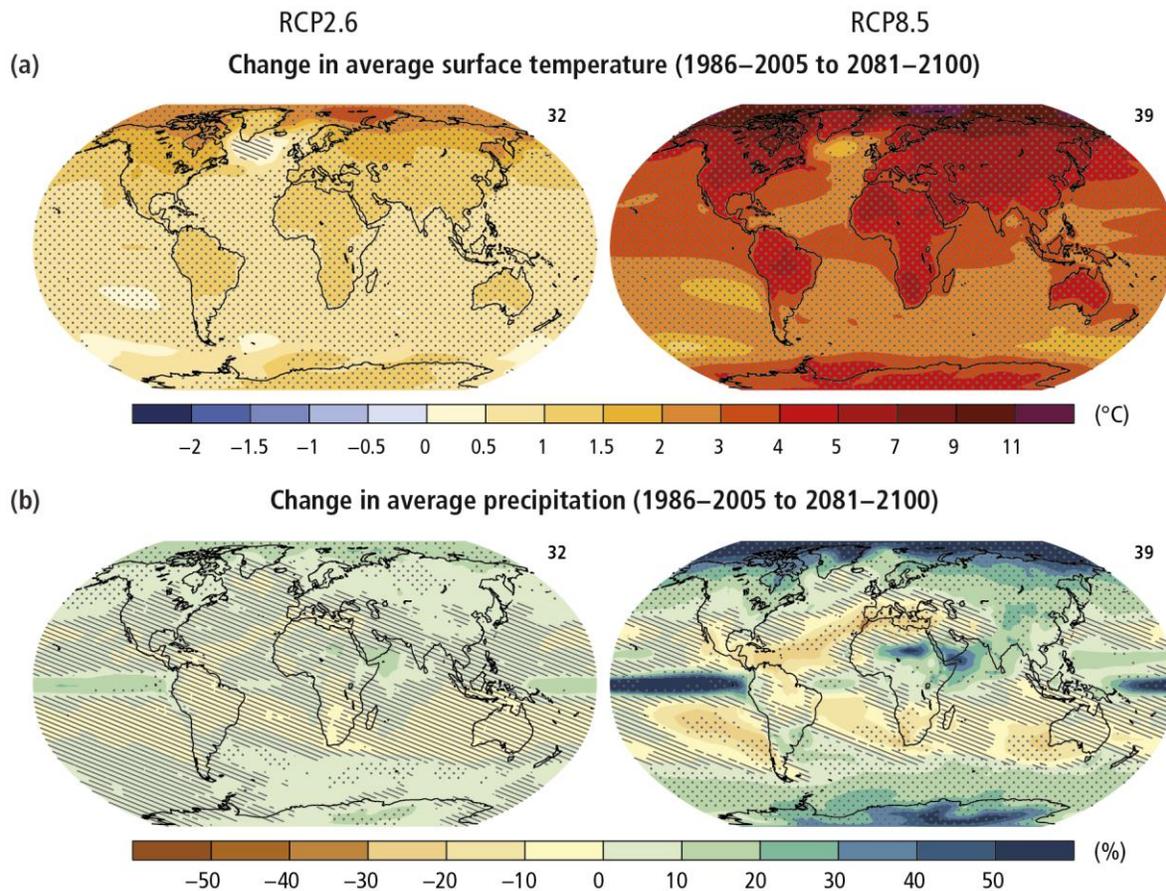


Figure 2 Change in average surface temperature (a) and change in average precipitation (b) based on multi-model mean projections for 2081–2100 relative to 1986–2005 under the RCP2.6 (left) and RCP8.5 (right) scenarios.

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 under nutrition 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

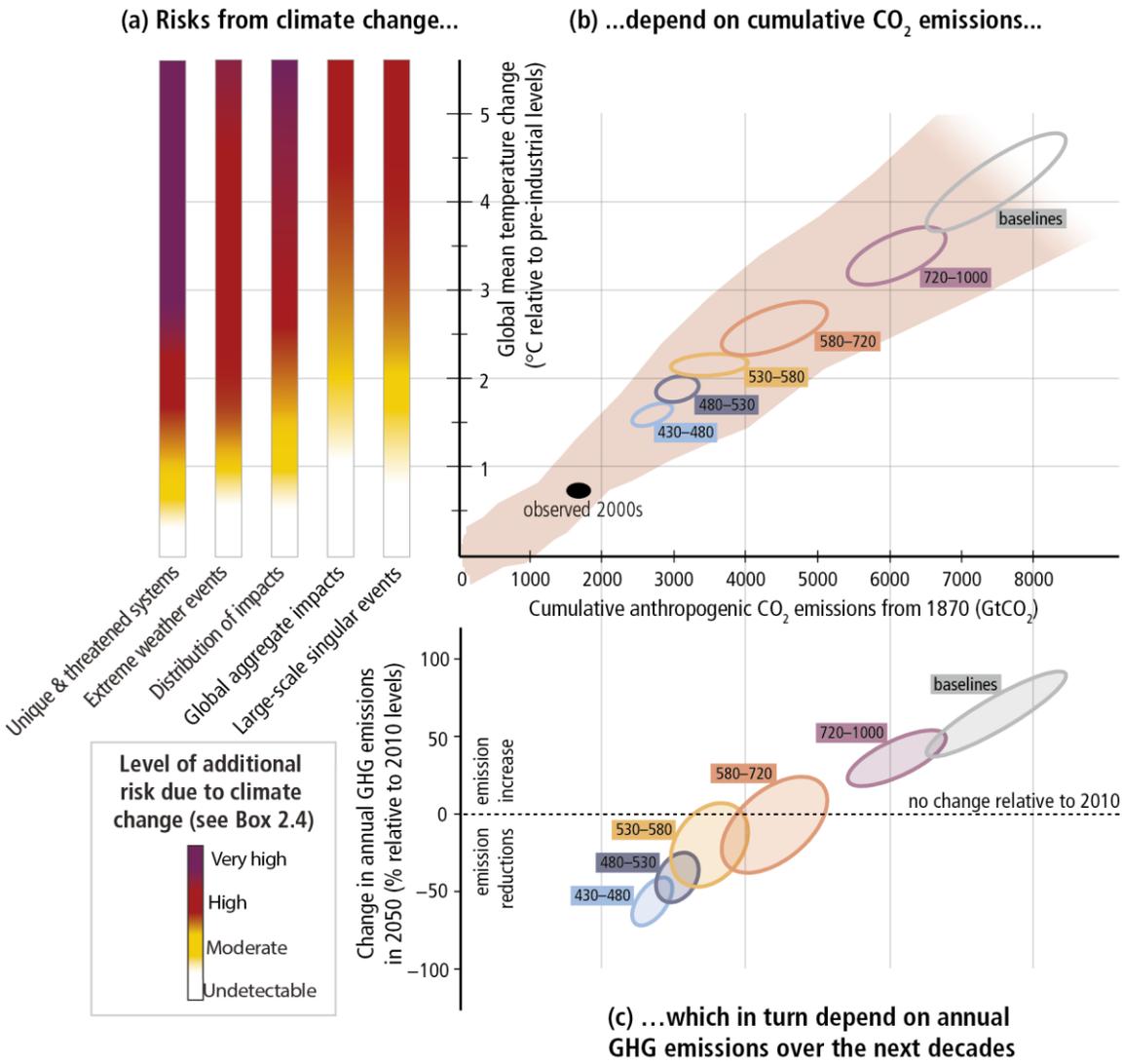


Figure 3 The relationship between risks from climate change, temperature change, cumulative carbon dioxide (CO<sub>2</sub>) emissions and changes in annual greenhouse gas (GHG) emissions by 2050.

Limiting risks across Reasons For Concern (a) would imply a limit for cumulative emissions of CO<sub>2</sub> (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 CO<sub>2</sub> emissions (in GtCO<sub>2</sub>) 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 CO<sub>2</sub> emissions (in GtCO<sub>2</sub>) of the scenario categories and their associated change in annual GHG emissions by 2050, expressed in percentage change (in

percent GtCO<sub>2</sub>-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.

# Appendix III: Borough of Indiana LCAP Resolution

**INDIANA BOROUGH  
RESOLUTION NO. 2021 -R2**

**A RESOLUTION OF THE BOROUGH OF INDIANA, INDIANA COUNTY,  
PENNSYLVANIA FORMALLY ADOPTING THE INDIANA BOROUGH CLIMATE  
ACTION PLAN.**

**WHEREAS**, the Borough intends to support climate change mitigation and adaptation efforts within Pennsylvania through local actions that reduce greenhouse gas emissions and build resilient infrastructure; and

**WHEREAS**, the Borough intends to be a welcoming and sustainable community while promoting public health and safety for current and future residents and visitors; and

**WHEREAS**, the Borough recognizes the need to prepare for the increasing frequency of extreme weather events, including flooding, droughts, heat waves, and reduced agricultural productivity through forward thinking actions including incorporating green infrastructure, deploying renewable energy systems and supporting the development of a re-localized agricultural economy; and

**WHEREAS**, the Borough intends to pursue climate change mitigation and adaptation funding for these projects by aligning its actions with those of state, national, and international initiatives; and

**WHEREAS**, the Borough supports sustainable economic development by advocating for clean affordable energy, re-localized sustainable agriculture, sustainable and energy efficient building standards, and strong environmental stewardship practices; and

**WHEREAS**, the Borough Council recognizes the Indiana Borough Climate Action Plan as part of its long-range planning documents and incorporates it as one framework to become a more sustainable and welcoming community.

**NOW, THEREFORE, BE IT RESOLVED**, that the Borough of Indiana Council adopts the Indiana Borough Climate Action Plan, produced with support and guidance of the Pennsylvania Department of Environmental Protection and Local Governments for Sustainability.

This Resolution was enacted by the Indiana borough council this 2nd day of February 2021, a quorum being present and the majority of the quorum of the Council voting in favor thereof.

ATTEST:

  
C. Michael Foote, Borough Manager

BY:   
Peter Broad, President of Council