Centre Region
CLIMATE ACTION & ADAPTATION PLAN

For the Borough of State College and Townships of College, Ferguson, Halfmoon, Harris, and Patton

Local Actions and Policies to reduce our greenhouse gas emissions and increase our climate resilience

Adopted by the Centre Region Council of Governments
11/22/21

Produced by Centre Regional Planning Agency
Through partnership with Local Government for Sustainability (ICLEI)

CRPA
Centre Regional Planning Agency

SUSTAINABLE
CENTRE REGION

A LETTER FROM THE CHAIR & DIRECTOR

We are pleased to present the Centre Region's 2021 Climate Action and Adaptation Plan which describes how the Centre Region Council of Governments, its member municipalities and its businesses and residents can work together to address the challenges of climate change and forge a better tomorrow for the Centre Region, fostering not only a healthy environment, but also a prosperous and resilient community.

This plan demonstrates municipal governments' commitment to addressing climate change and calls on all residents and businesses to be partners in this effort. This plan identifies strategies that each of us can take to reduce emissions through greater efficiency of homes and businesses and reduced use of fossil fuels. With your participation we can address the challenge of climate change together and in the process provide leadership for others in Central Pennsylvania and beyond.

This plan is not our first step in preparing for a sustainable future. Our Region's municipalities have been recognized with the Sustainable Pennsylvania Community Certification for their efforts and commitments. They are partnering with other local organizations to procure and invest in a solar power purchase agreement that will meet our energy needs cost effectively for years to come. More sustainable accomplishments are highlighted throughout the plan.

We are grateful for the work of the Technical Advisory Group, the Climate Action and Sustainability Committee, and staff for providing leadership and guidance in developing the Climate Action and Adaptation Plan. For it is only through collaboration, teamwork and the combined efforts of our entire community that we can achieve our goal of a 45 percent reduction in greenhouse gas emissions by 2030.

We thank you for your interest and urge you to read this plan. Collectively we can strengthen our economy, clean the environment and improve the health and wellness of community members to ensure the Centre Region continues to thrive in the decades to come.

Sincerely,

Dennis Hameister
Chair, Centre Region COG

Eric Norenberg
Executive Director

ACKNOWLEDGEMENTS

Climate Action and Sustainability Committee (2021)
Public Services & Environmental Committee (2019 – 2020)

- **Carla Stilson** College Township, CAS and PSE Committees
- **Prasenjit Mitra** Ferguson Township, CAS and PSE Committees
- **Pam Steckler** Ferguson Township,CAS Committee
- **Danelle DelCorso** Halfmoon Township, CAS and PSE Committees
- **Barbara Spencer** Halfmoon Township, PSE Committee
- **Bud Graham** Harris Township, CAS Committee
- **Dennis Hameister** Harris Township, PSE Committee
- **Betsy Whitman** Patton Township; CAS and PSE Committees
- **Deanna Behring** State College Borough, PSE Committee
- **Jesse Barlow** State College Borough, CAS and PSE Committees
- **Rob Cooper** Penn State University, CAS Committee
- **Gretchen Brandt** State College Area School District, CAS Committee

Climate Action and Adaptation Technical Advisory Group (TAG)

- **Brandi Robinson (Chair)** PSU Assistant Teaching Professor, Energy and Mineral Engineering
- **Peter Buck (Vice-Chair)** PSU Sustainability Institute Academic Programs Manager
- **Alan Sam** State College Borough Environmental Coordinator/Arborist
- **Jasmine Fields** State College Borough Sustainability Program Officer
- **Franklin Egan** Pasa Sustainable Agriculture Education Director
- **Jason Wert** Rettew Renewable Market Leader
- **Pam Adams** COG's Centre Regional Planning Agency Sustainability Planner
- **Adam Brumbaugh (Advisor)** College Township Manager

Centre Regional Planning Agency (CRPA)

- **Jim May, AICP** Planning Director
- **Tom Zilla, AICP** Principal Transportation Planner
- **Mark Boeckel, AICP** Principal Planner
- **Trish Meek, AICP** Senior Transportation Planner
- **Greg Kausch** Senior Transportation Planner
- **Pam Adams** Sustainability Planner
- **Nicole Pollock** Senior Planner
- **Corey Rilk** Senior Planner
- **Steve Arnold** GIS Specialist/Graphic Design
- **Marcella Hoffman** Office Manager
- **Shelly Mato** Refuse & Recycling Program Administrator

A special thanks to all community members who participated in the Sustainability Survey and the *Addressing Climate Impacts in the Centre Region* Public Forum. Your input helped guide the development of the Climate Action and Adaptation Plan.

Student Contributors

- Phill Becker, Jess Chou, Lauren Miller, Jared Szczesniak, Ryan Muller, Madison McCormick, Nora May, Sean Gray
- Graphic Design 203 students, Spring 2020 – Emily Burns, *PSU Assistant Professor*
- Communications 473 students, Spring 2021 – Tara Wyckoff, *PSU Assistant Teaching Professor*
- Mediation of Environmental and Public Conflicts EXPR 972 students, Spring 2021 – Lara Fowler, *PSU Law Professor* and Ekrem Korkut, *PSU Postdoctoral Scholar*

Other Contributors

- Lachlan Campbell, *Web Designer-Developer (CentreSustains.com)*
- Ryan Hockenberry, *State College Borough Public Works Foreman*
- Amy Farkas, *Harris Township Manager*
- Shawn Kaufmann, *Emergency Management Coordinator*
- Dave Modricker, *Ferguson Township Public Works Director*
- Subject matter experts participating in the Climate Actions for our Community Sessions May – December 2020 (see Appendix)

External Agencies and Partners

- Heidi Kunsch, *Pennsylvania Department of Environmental Protection*
- Calyn Hart, *ICLEI – Local Governments for Sustainability USA*
- Eli Yewdall*, ICLEI– Local Governments for Sustainability USA*
- Jesse Carpentier, *ICLEI– Local Governments for Sustainability USA*
- *Ferguson Township Climate Action Committee*
- *State College Borough Sustainability Committee*

Photo Credits

PG 6 Christopher Campbell | PG 10, 36, 45 Benner Township | PG 15, 49, 91, 106, 108, 111 Pam Adams | PG 15, 106, 108 Frank Scott |PG 19 Erin Hogge | PG 24 Envinity | PG 33 Glenn Watson; The Collegian | PG 39 Shawn Kauffman | PG 59 Nabil K. Mark; SCASD |PG 61 Sun Directed | PG 67 Jason Wert | PG 75, 106 Trish Meek | PG 83 State College Borough | PG 85 K Tamminga | PG 92, 108, 110 Steve Arnold | PG 99 ClearWater Conservancy | PG 105 Michelle Bixby; Penn State | PG 106, 110 Sam Brungo | PG 108 Ferguson Township | PG 108 Paul Fritzsche; Nittany Aerial Photo & Video | PG 110 Jim May

Primary Author

Pam Adams - *Centre Regional Planning Agency*

Report Design

Steve Arnold - *Centre Regional Planning Agency*

This Climate Action and Adaptation Plan was made possible through a grant agreement between ICLEI – Local Governments for Sustainability and the PA Department of Environmental Protection, which was funded by the US Department of Energy State Energy Program. Some sections are use the PA DEP version of the ICLEI – Local Governments for Sustainability, USA template.

TABLE OF CONTENTS

106
Appendix

- CRCOG Factsheet
- Weblinks for Additional Information:
  - Technical Advisory Group
  - GHG Emissions Inventory Report
  - Resolution 2020-1
  - Sustainability Survey Report
  - Community Forum Report
  - Centre County Hazard Mitigation Plan 2021 Update
  - Ferguson Township Community Resiliency Building Workshop
- Acronyms
- Climate Action for our Community Sessions
- References
- Climate Science:
  - NOAA Pennsylvania Climate Summary
  - IPCC 1.5 Special Report – Headlines for Policy Makers

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 Centre Region is no exception. While all levels of governance are necessary to create and sustain the policy measures and actions necessary to adequately address these climate challenges, the impacts will be felt locally. This Plan is about how our local governments can play an essential role in preparing our community for the changing climate and be leaders in building a low-carbon community of the future.

Local Challenges

More frequent and severe storms

Pennsylvania is projected to experience more total average rainfall, occurring in less frequent but heavier rain events. Between 1958 and 2016, the Northeast saw more than a 55% increase in the amount of precipitation falling in very heavy events[1]. Most recently, remnants from Hurricane Ida caused record-setting rainfall rates of three inches or more in an hour in the Northeast. **Extreme rainfall events are projected to increase in magnitude, frequency, and intensity.**

Increasing temperatures

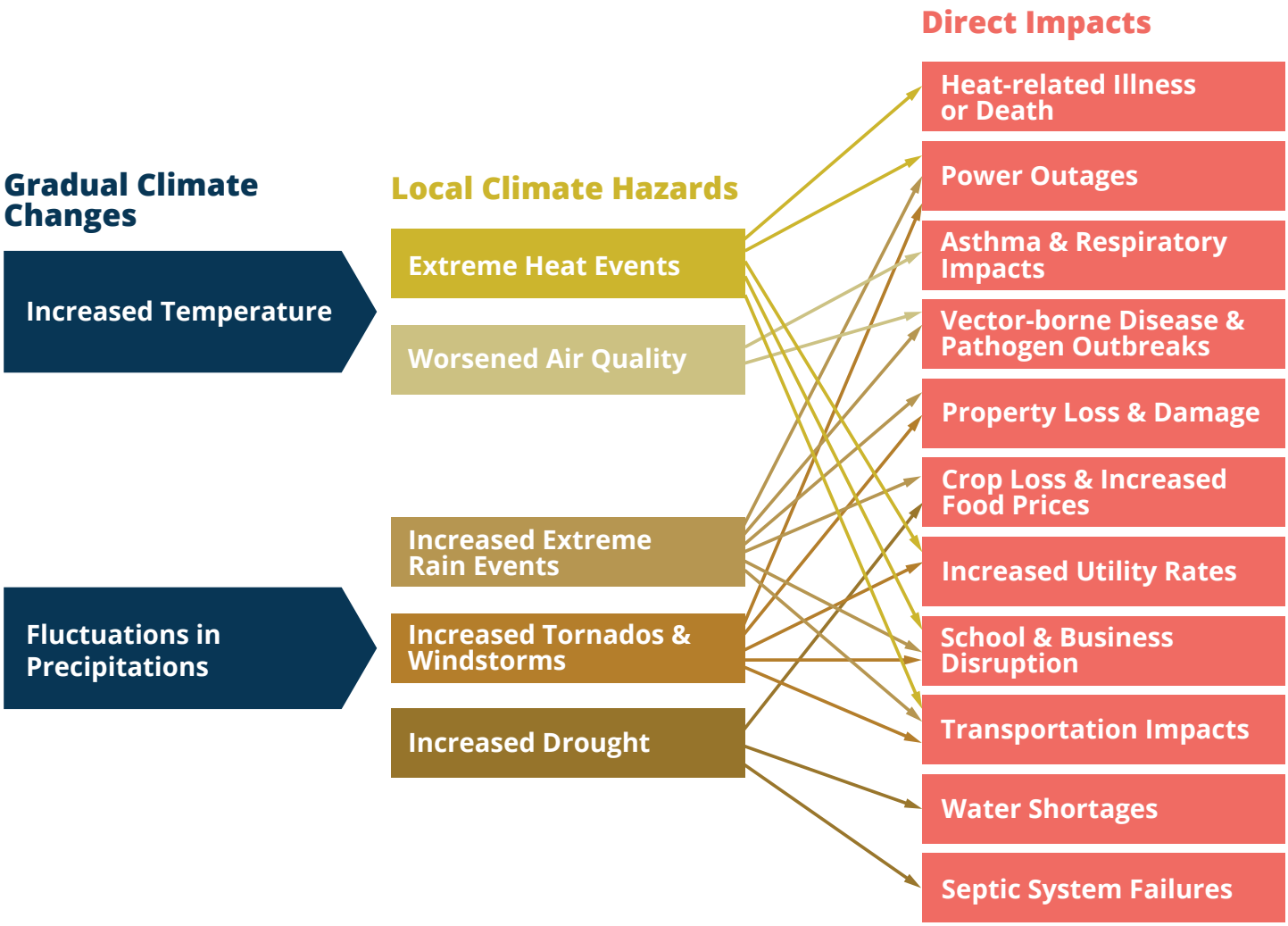
By 2050 Pennsylvania is likely to experience a 5.9°F increase in average annual temperatures if global greenhouse gas emissions continue to increase[5]. There will be more frequent and intense extreme heat events. The Centre Region is likely to suffer 30-60 more days with temperatures reaching at least 90°F[5]. Days reaching temperatures above 95°F and 100°F will become more frequent as well.

Impacts

The Centre Region is experiencing the impacts of the changing climate. **This puts a burden on our infrastructure and disrupts our economic, social, and environmental systems**. Record-breaking floods and landslides caused infrastructure damages in Pennsylvania totaling $125 million in 2018[3]. Increasing temperatures will continue to alter the growing season for our agriculture community and will increase the number of days that people need to cool their homes and workspaces. Temperature rise, coupled with increased precipitation are main drivers of vector-borne diseases and pathogens that will negatively impact human health, agriculture, and outdoor recreation.

Everyone will be affected but not everyone will be affected equally. Vulnerable populations are most at risk to the impacts of climate change due to existing social, economic, and environmental barriers. The CAAP advocates for intentional policies, programs, and budgets that recognize the livelihoods of marginalized people.

A changing climate will impact the Centre Region in a multitude of ways. **There are considerable opportunities to prepare for and respond to these changes while also creating co-benefits for our communities**. Municipalities and other public stakeholders have already begun taking steps to make our community more resilient. The development of Centre Region Climate Action and Adaptation Plan (CAAP) demonstrates further commitment to meet our greenhouse gas (GHG) emissions reduction targets and prepare our community to adapt to the changing climate.

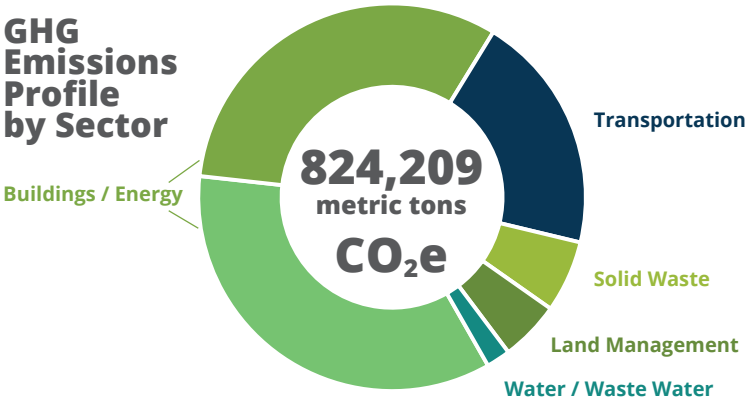


Increasing Vulnerabilities

The Process

Emissions Inventory

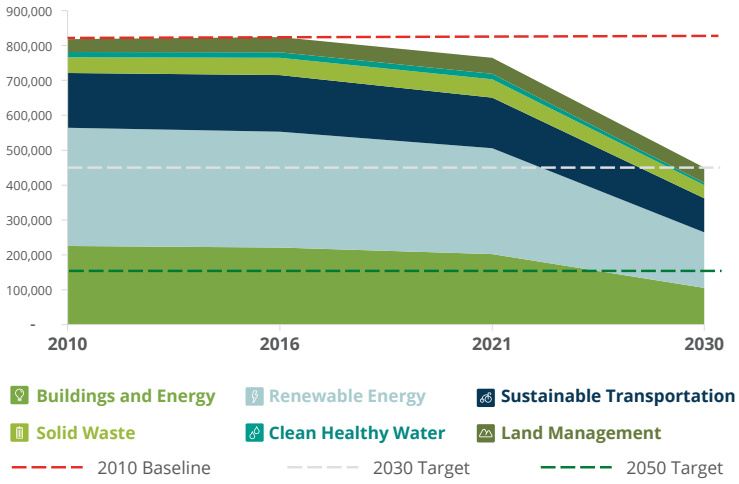
The CAAP includes an inventory of the Centre Region's GHG emissions from community-wide activities. CRCOG used the GHG emissions inventory to set emissions reduction targets, identify tangible actions aimed at reducing GHG emissions, and will perform future inventories to measure progress toward achieving those targets. The 2016 inventory was prepared according to the ICLEI-Local Governments for Sustainability (ICLEI) Community Protocol and includes emissions from buildings, transportation, solid waste, water and wastewater operations, and some land management operations. The results are expressed in metric tons of carbon dioxide equivalent (MTCO□e).



Across the Centre Region, our annual greenhouse gas emissions are 824,209 $MTCO_2e$, which is approximately 10.21 $MTCO_2e$ per person. Our emissions per person are more than 2x the global average, though average for U.S. suburban areas. Buildings and energy form the largest contribution of GHG emissions in the region (67%) with transportation the next largest (20%). This represents a significant opportunity to reduce emissions and help our community meet its reduction targets.

Targets

In July 2020, the elected officials of the Centre Region formally resolved to create a regional plan to **reduce 2010 level greenhouse gas (GHG) emissions by 45% by 2030, and 80% by 2050**. The resolution also stated the plan should identify and encourage courses of action to lessen the impacts of changing climate conditions and embrace the opportunities of climate adaptation.



Community Engagement

Effective climate mitigation and adaptation plans are not possible without active support of key stakeholders and engagement with the public. **Many individuals and organizations played a role in shaping this plan**. A Climate Action and Adaptation Technical Advisory Group (TAG) was formed in 2019 to provide technical assistance to the Sustainability Planner and the corresponding CRCOG Committees during preparation of the CAAP. The advisory group used the input from five subject matter expert sessions, public and stakeholder input, and relevant best practices from peer and aspirational cities to inform recommendations for the plan.

The Covid-19 pandemic required a modified form of community engagement, but several efforts were made to reach stakeholders and community members. Over 1,800 community members provided input through the Sustainability Survey that was conducted in March through April 2021. A virtual public forum was held on April 13, 2021 with more than 150 participants.

CRCOG recognizes that there is a need to reach a broader audience as the municipalities begin to implement strategies within the CAAP. It's vitally important to have collaborations with governmental entities, businesses, community organizations, and residents. Through these efforts and others, the Centre Region can achieve additional benefits beyond reducing emissions, including saving money and improving the Centre Region's economic vitality and quality of life.

The Plan

This Climate Action and Adaption Plan builds upon existing policies and programs with 82 actions to be taken by the community and local government which will result in a **45% reduction of community-wide GHG emissions by 2030.** Implementing the actions will also allow the Centre Region to remain a resilient, healthy community for current residents and for future generations. Local governments' role will be to lead by example, foster partnerships, create policy, and help disseminate information.

ENERGY & BUILDINGS

Achieve building efficiencies to reduce energy consumption 30% for homes and 25% for businesses.

- Improve energy efficiency best practices in existing buildings.
- Increase the number of new buildings and homes that are net zero energy ready, affordable, and resilient.
- Maximize efficiency of municipal facilities, equipment and operations.
- Enhance resiliency throughout the community.

RENEWABLE ENERGY

Transition fossil sources to renewables for 10% homes' and 5% businesses' energy usage.

- Develop a resilient energy portfolio through diversified sources and local generation.
- Improve access to affordable clean energy for residents and small organizations.
- Support clean energy policy and growth.

SUSTAINABLE TRANSPORTATION

Increase the trips taken with sustainable options and convert 25% of the communities' vehicles with EVs.

- Encourage driving cleaner, more efficient vehicles and traffic operations.
- Reduce the trips with one driver.
- Align land use and housing with transportation infrastructure to increase access to walking, biking and public transit.
- Improve and build resilience into our transportation systems.

SOLID WASTE

Reduce the amount of waste sent to the landfill by 25%.

- Encourage reducing waste at the source in municipal operations, homes and businesses.
- Increase diversion in municipal operations, homes and businesses.
- Improve efficiencies of waste management.
- Support locally produced products.

LAND MANAGEMENT

Preserve, restore, and responsibly manage the region's diverse and fragile environmental resources.

- Educate, encourage, and promote sustainable agricultural, forest and land management practices.
- Promote and support rebuilding soil and sustainable practices that sequester carbon.
- Reduce reliance on carbon heavy fuel sources.
- Support land managers becoming more resilient.

CLEAN HEALTHY WATER

Conserve, protect, enhance, and restore our water resources.

- Manage flooding and reduce erosion impacts on infrastructure.
- Grow and maintain a healthy tree canopy (urban, suburban, rural, forest).
- Increase the region's resiliency by restoring, protecting, and conserving community water resources.
- Restore and protect ecosystems and promote ecosystem resilience.

Next Steps

Implementation

The completion of this plan does not mark an endpoint, but rather the **beginning of a long-term effort**. The CAAP provides a framework for launching into the implementation phase of the plan. Given that this is the Region's first climate action plan, and to encourage broad participation, CRCOG envisions a phased approach for implementation.

Initial Action:

- The Centre Region municipalities will lead by example to serve as a catalyst for broader community action.
- Early implementation efforts will also emphasize educational programs and incentives to inspire action, build community support, develop public-private sector partnerships, and enhance community readiness.
- Local government and the community will define priority actions that will drive the creation of specific plans of action and resource needs among the responsible parties.

These initial actions can build the broader ownership that is essential to create momentum, guide decision making, and lay the groundwork for more transformational actions needed in the future.

Monitoring

Plan progress should be monitored and evaluated regularly, and this document should be updated as technologies, economic conditions, and demographics change. **Establishing a monitoring process will be necessary to enable CRCOG to track the impacts of the actions included in the plan** and compare estimated impacts to what is achieved in terms of energy savings, renewable energy production, GHG emissions reduction, and community resiliency. Monitoring progress will assist in the determination of whether an action is performing well and to identify corrective measures. Providing progress updates to the community will lead to greater understanding and help build broader community support.

Funding

The strategies and actions contained in the CAAP will require funding over the entire course of implementation. CRCOG and municipalities will need to employ long-term and creative approaches to secure funding sources and take advantage of **public-private sector partnerships, grant opportunities, evolving renewable markets, and emerging technological opportunities** to successfully implement reductions in GHG emissions and climate adaptation actions.

The CAAP is a comprehensive roadmap to accelerate our continued success in building a more healthy, equitable, resilient, and sustainable community. It is also a call to action to governmental entities, residents, businesses, and community organizations to take an active part in the implementation of the Plan to support our community transition to a low carbon future, prepare for the impacts of climate change, and create a healthier and more prosperous community.

INTRODUCTION

The Centre Region Council of Governments (CRCOG) recognizes the substantial consequences that climate change poses to our local environment, public health, economy, and lifestyles.

As evidenced through collaborative efforts across our communities and sectors, the Centre Region is determined to identify, address, and to the degree possible, prevent the negative impacts of climate change.

Furthermore, CRCOG member municipalities have multiple opportunities to benefit by acting quickly to reduce community greenhouse gas (GHG) emissions. The recommended actions in this plan will provide ancillary co-benefits to Centre Region residents and the community by working to reduce energy and transportation costs, improve health, support local businesses, and develop and promote an economy centered around energy efficiency and good sustainability practices, thereby making the community an even more attractive place to live and work. Additionally, CRCOG, as an early leader in climate action, is helping to lead the way for other local municipalities throughout Pennsylvania.

Centre Region Council of Governments (CRCOG)

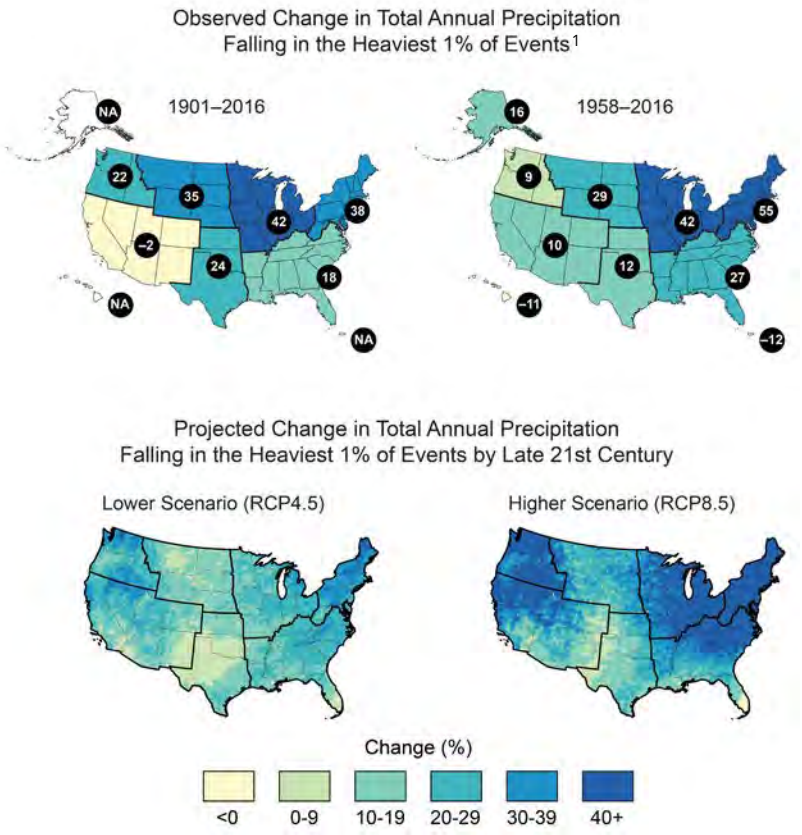
Climate Action & Sustainability Committee

The CRCOG is a voluntary association of six municipalities: State College Borough, and College, Ferguson, Halfmoon, Harris and Patton Townships. It is governed by the General Forum, which is comprised of all 32 elected municipal officials of the six municipalities. Seven standing committees exist within CRCOG to address a variety of local issues, programs, and services. The Climate Action and Sustainability (CAS) Committee is one of these committees and is comprised of six elected municipal officials and two non-voting members representing Penn State University and State College Area School District. The CAS Committee was formed in 2021 to oversee the development of a regional Climate Action and Adaptation Plan.

Understanding the Climate Impacts in the Centre Region

Climate change impacts everyone and those impacts are increasing in frequency and intensity. Effects range from minor (seasonal comfort levels or a longer allergy season) to major (such as property damage, weakened infrastructure, disruption of essential services, and increases in public health issues like asthma). These impacts may affect some populations more adversely than others.

The Northeast has experienced a greater recent increase in extreme precipitation than any other region in the U.S.; between 1958 and 2016, the Northeast saw more than a 55% increase in the amount of precipitation falling in very heavy events as shown in image to the right[1]. These trends are expected to continue in Pennsylvania. This puts a burden on infrastructure and disrupts economic, social, and environmental systems.

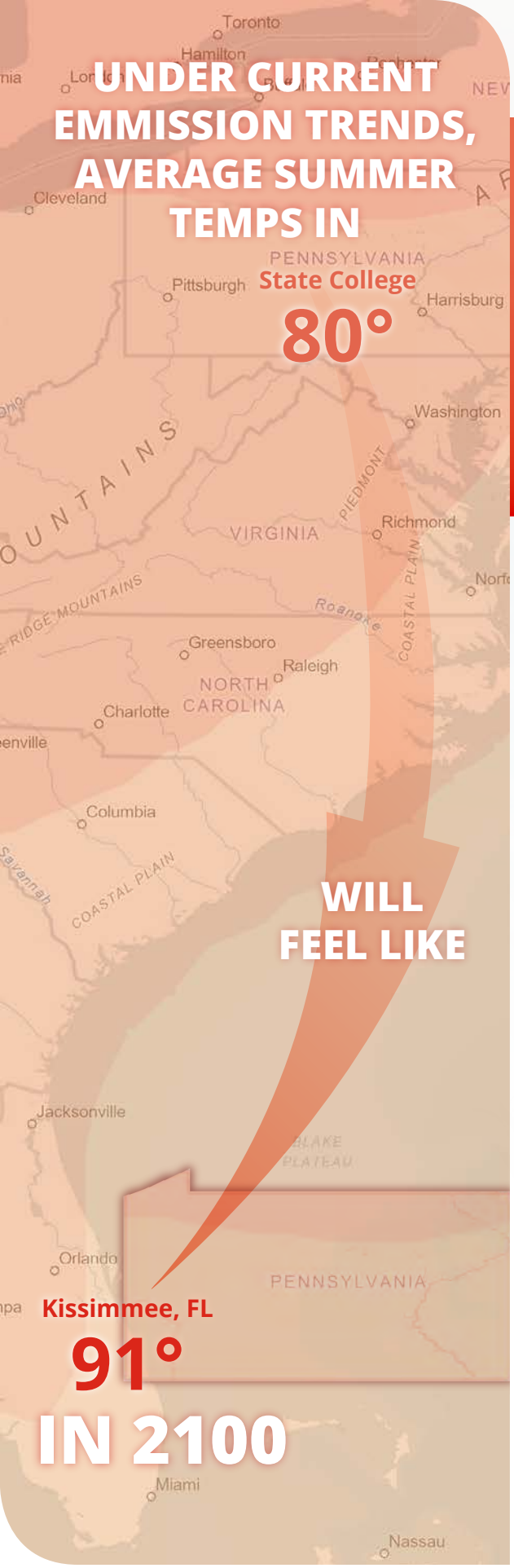


Other expected impacts to the Centre Region include summer heat waves and temperature swings at odd seasonal time periods, all of which will disrupt ecosystems, habitats, and agricultural activities. The changing climate could destroy two of our state symbols: the eastern hemlock tree and the brook trout.

Agricultural impacts are being felt today. Due to increased frequency and intensity of precipitation events, farmers are experiencing direct crop loss. July 2018 was the wettest month on record, resulting in flooding events that led to significant crop loss in Pennsylvania. This caused 61 counties (including Centre County) to apply for disaster relief through the USDA, thus forcing farmers to increase their debt burden if they looked to recoup losses[2].

Extreme rain and wind events cause damage to our infrastructure, which cost money to repair and are disruptive to homeowners and businesses. Record-breaking floods and landslides caused infrastructure damages In Pennsylvania totaling $125 million in 2018[3].

Intense rainfall and severe weather events have also increased the preponderance of pathogens and fungus; in 2018, Corl Street Elementary delayed the school year opening for the fall to manage and mitigate a mold outbreak.



Projections are that by 2100 State College summers will feel like those in Central Florida[4].

This increase in heat intense days can lead to problems as varied as increased heat stroke for vulnerable populations, higher electricity demand to condition building temperatures, flooding, and infrastructure damage.

Temperatures will continue to be variable year-to-year, but the average temperature is trending upward. Average annual temperature in Pennsylvania is expected to increase by 5.9°F (3.3°C) by mid-century. And the number of heat intense days, defined as greater than 90° will increase[5].

Climate change also will likely exacerbate the prevalence of pathogens and fungus. Temperature rise, coupled with increased precipitation, are main drivers of vector-borne diseases and pathogens that will negatively impact human health, agriculture, and outdoor recreation. Between 2004 and 2016, the frequency of vector-borne diseases nearly tripled nationally, starting at roughly 27,000 reported cases and increasing to 96,000 in 2016[6].

Pennsylvania has the highest total reported cases of all states for Lyme disease in 2019 and four of the top five states with the highest totals are in the Northeast[7]. Climate change will lead to greater exposure risk, as temperatures and precipitation rise, creating opportunity for breeding and transmission.

A changing climate will impact the Commonwealth and the Centre Region in a multitude of ways. There are considerable opportunities to prepare for and respond to these changes while also creating ancillary benefits for our communities. These are called co-benefits and are outlined in the next chapter.

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 greenhouse gas (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 Impacts Assessment and Climate Action Plan, both to be updated every three years. The most recent Climate Impacts Assessment was updated in 2021, and the most recent Climate Action Plan, as well as GHG emissions inventory, was released in 2019.

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).

The Centre Region's reduction targets align with the statewide targets to ensure consistency with the PA Climate Action Plan. In addition, many of the statewide actions were incorporated into this plan.

Centre Region's Climate Goal

On July 27, 2020 the General Forum formally resolved to reduce 2010 level greenhouse gas (GHG) emissions by **45% by 2030**, and **80% by 2050**.

The establishment of this plan demonstrates a commitment to pragmatic, fiscally responsible actions to:

- **mitigate GHG emissions**
- **adapt to changing climate conditions**

CO-BENEFITS OF CLIMATE ACTION

The Climate Action and Adaptation Plan (CAAP) was developed to reduce GHG emissions and increase our resiliency. Successful execution of the CAAP will bring several critical benefits to humans and the natural world and we call these co-benefits. These include creating jobs and economic prosperity, advancing social equity, fostering resource security, and improving public health and local environmental quality.

These co-benefits detailed on the following pages are key opportunities to leverage the importance and impact of the CAAP.

1. Creating jobs and economic prosperity

Actions taken to reduce greenhouse gas emissions have other important benefits beyond addressing climate change. The most obvious co-benefit is the potential for economic prosperity through job growth, cost savings, and risk reduction.

The actions included in this plan can spur business and job growth in fields such as energy efficiency, renewable energy, and regenerative land practices. This presents a particular opportunity to reinvest in the local economy and generate green jobs within our region.

In 2018, COG and the six Centre Region municipalities 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. Indirect costs such as maintenance are also reduced. Encouraging energy efficiency, public transit use, building improvements, water conservation, and other measures lower energy and water bills for not only residents but employers as well.

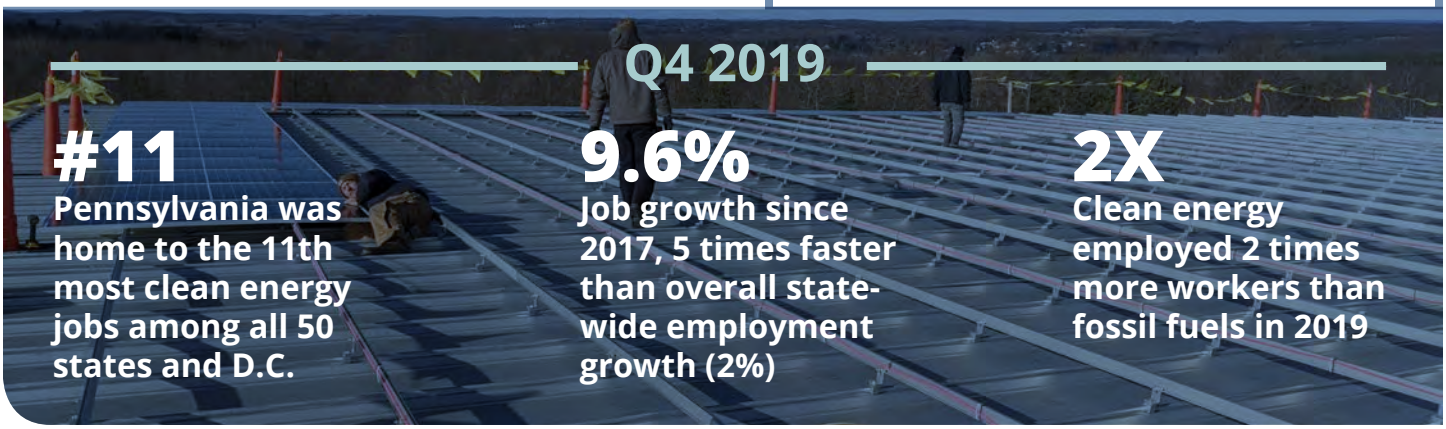
Acting now can also save on long-term, escalating costs attributed to climate change, especially in the longer term. These costs range from infrastructure damage in extreme storms and pest control to industry losses, particularly for businesses that depend on environmental conditions, such as winter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

2. Advancing Social Equity

Social equity and justice are major concerns for addressing climate change and were established as core values of this plan. Equity occurs when all individuals have access to 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 the identification of issues impacting vulnerable communities.

If evaluated and acted upon responsibly, many actions in the CAAP can help foster a more inclusive, just, and sustainable Centre Region, while ensuring that all can share the benefits. But it will require local government to find successful ways to engage and include residents who have been traditionally marginalized and will be disproportionately impacted by the changing climate.

In 2019, clean energy jobs in Pennsylvania increased for the 7th straight year, growing to nearly 94,000 jobs statewide[8].



3. Fostering Resource Security

A strategic co-benefit of climate change mitigation is enhancing energy security by diversifying how energy is generated and by reducing total demand. This puts less strain on the energy system as we transition to renewable energy. Similarly, demand shifts can improve water and food security as well.

Many of the CAAP actions to mitigate GHG emissions will also help Centre Region's governments, 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 Centre Region, such service disruptions are less likely, and the community will be better able to adapt to those situations. Similarly, climate actions can secure food and water sources and prevent damage and service disruptions to these systems from drought and flooding.

4. Improving Public Health and Local Environmental Quality

Our community has always made air and water quality a top priority. The actions in this plan will strengthen the protection of our community members and our natural resources.

Many of the health benefits of climate actions are direct. Increasing safe, accessible, and active transportation options such as walking, biking, and taking transit increases opportunities for physical activity, reduces air pollution, and reduces risk of vehicular crashes.
In turn, these direct benefits can decrease obesity, chronic disease, respiratory ailments, and traffic injuries. They may also improve mental health.

Energy efficiency reduces the operating cost and environmental impact of buildings. Efficient and well-functioning heating and cooling systems improve a building's efficiency and results in better indoor air quality making our buildings healthier to live and work in. Prioritizing development practices that support sustainable commuting choices make for a more vibrant, livable community with shorter commute times. This can create more connected and resilient neighborhoods.

Sustainable land practices such as increases in tree canopy, restoring and protecting natural systems, and investing in green infrastructure can improve air quality and reduce noise, which improves respiratory and mental health. In addition, efficiently using our resources, expanding our green space, and shifts to more sustainable behaviors supports healthier ecosystems, which in turn supports a healthier community.

Natural hazard mitigation saves on average six dollars for every one dollar spent, according to the National Institute of Building Sciences.

CENTRE REGION'S GREENHOUSE GAS EMISSIONS

The first milestone, a greenhouse gas (GHG) emissions inventory, was compiled in 2019 and identified GHG emissions for the Centre Region in 2016 were 824,209 metric tons of carbon dioxide equivalent (MTCO2e). The inventory estimates the GHG emissions resulting from activities and sources in 2016 for the Centre Region community, which includes the Borough of State College and Townships of College, Ferguson, Halfmoon, Harris, and Patton Townships. ICLEI's U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, version 1.2, was used for the inventory[9].

CRCOG has used the GHG emissions inventory to set emissions reduction targets, identify tangible actions aimed at reducing GHG emissions, and will perform future inventories to measure progress toward achieving those targets.

CENTRE REGION'S COMMUNITY-WIDE GHG EMISSIONS INVENTORY

Across the Centre Region, our annual greenhouse gas emissions are 824,209 metric tons CO2e. Our emissions per person are more than 2x the global average, though fairly average for U.S. suburban areas. This amount is equivalent to a person driving over two billion miles annually or it equates to the need for a quarter of a coal fire power plant for one year. Our Region's emissions total represents 0.3% of Pennsylvania's total GHG emissions, which is approximately 264 million MTCO2e.

Penn State has its own GHG emissions inventory (http://sustainability.psu.edu/climate-action) and their data is not included in this community GHG inventory report. While each will have separate inventories and climate action plans, the two entities plan to work together to coordinate and support each other's climate action and adaptation efforts.

This inventory only includes carbon emitted locally, not individuals' total footprints, so the carbon impact of product purchases, shipments, flights, etc. are not included. A future inventory recommendation is to consider consumption-based emissions, which could illustrate the full, life cycle impacts of community members' impact.

The graphic on the next page shows the scale of the five sectors of GHG emissions for the Centre Region community. Residential energy, commercial energy and transportation are the three largest contributors to emissions over which CRCOG and the six municipalities has significant influence.

CRCOG GHG EMISSIONS INVENTORY

In addition to the community-wide inventory, CRCOG evaluated the carbon footprint resulting from its own municipal operations. In 2018, CRCOG operations generated 2,003 metric tons of CO2e, which is roughly 0.2% percent of the community total. These emissions from CRCOG's operations are embedded within the community-wide totals. For example, emissions from CRCOG buildings and facilities are included in the "Energy and Buildings" sector and emissions from our fleet vehicles are included in the "Transportation" figure on the next page. Government operations are therefore a subset of total community emissions. Based on the GHG emissions inventory completed by a few of CRCOG members municipalities it is estimated that municipal government operations in the Centre Region are roughly 1% of the community total.

GHG REDUCTION TARGET

The Centre Region set GHG emissions reduction targets that are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement. The Paris Agreement recommends targets that limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C. See the Headline Statements from the Summary for Policy Makers from the Intergovernmental Panel on Climate Change (IPCC) Special Report in the Appendix for more detailed information.

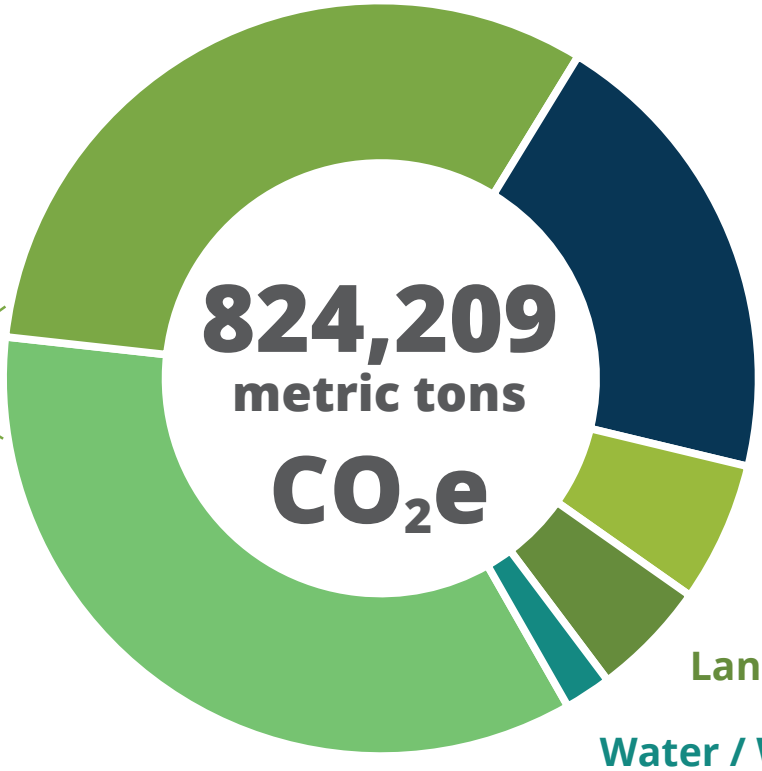
Resolution 2020-1 set the following GHG emissions reduction targets for the Centre Region:

- **45% reduction in GHG emissions by 2030 based on 2010 levels**
- **80% reduction in GHG emissions by 2050 based on 2010 levels**
- **Offset the remaining 20% of GHG emissions in 2050 with carbon offset projects to be carbon neutral in 2050**

Note: 2010 was chosen as the baseline year for the Centre Region to align with the IPCC report's baseline year. Data was available from a 2006 inventory completed by a Penn State University team making it possible for CRPA staff to extrapolate the Centre Region 2010 levels.

The Region's reduction targets are consistent with the climate goals and targets identified in Pennsylvania's Climate Action Plan, Ferguson Township's Resolution 2017-14, Harris Township's Resolution17-13, and State College Borough's Resolution 1229. While the targets are aggressive, there are actions that can be taken at the local and state level that will allow the Region to meet these targets.

GHG Emissions Profile by Sector



Buildings / Energy (67%)

Electricity, natural gas & heating fuels

- 52% residential
- 48% commercial

Transportation (20%)

- 79% passenger vehicle
- 17% trucks (freight & service)
- 4% transit (buses)

Solid Waste (6%)

Transit of solid waste & recycling, processing & landfill operations

Land Management (5%)

Livestock emissions, fertilizer & park maintenance

Water / Wastewater (2%)

Water treatment plant electricity/ propane & emissions

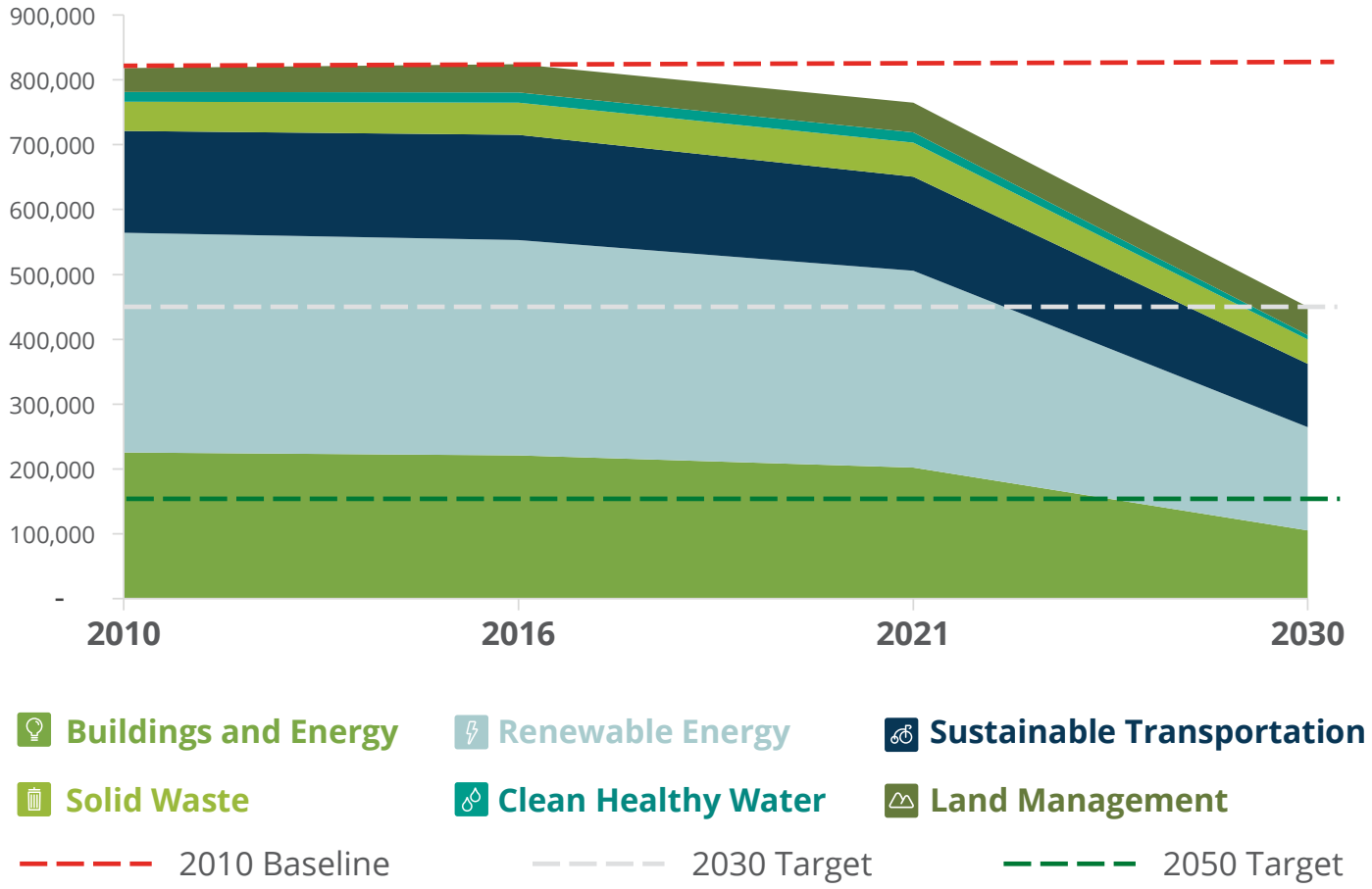
FORECASTED IMPACT OF CAAP

CRCOG has completed an emissions forecast based on projections of current data and expected future trends. To meet the emissions reduction target with forecasted growth, the Centre Region must reduce its emissions 374,500 MTCO2e from 2016 emissions levels. The combination of measures that the Centre Region has already implemented, are currently planned, and are presented through this Climate Action and Adaptation Plan are designed to achieve the 2030 targets. Reductions in 2030 rely on the best information currently available pertaining to population forecasts, future changes to building codes and the electric grid, and vehicle fuel efficiency standards among other information.

The summary table below identifies the sectors within the Centre Region Climate Action and Adaptation 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 actions are described.

Sector	Description	Number of Distinct Actions	Anticipated MTCO2e Reduction by 2030	Percentage of Total Reduction at 2030
Buildings and Energy	Policies and programs to reduce municipal, residential and commercial, energy use.	14	-119,994	32%
Renewable Energy	Policies and programs to promote local small-scale renewables.	12	-179,992	48%
Sustainble Transportation	Policies and programs to reduce on-road vehicle miles traveled and promote electric or low emission vehicles.	16	-59,263	16%
Solid Waste	Policies and programs to reduce solid waste generation.	15	-7,506	2%
Clean Healthy Water	Policies and programs to reduce water and corresponding wastewater treatment energy needs.	14	-7,724	2%
Land Management	Policies and programs to reduce emissions from urban land use, protect natural resources, and bolster resilience	11	N/A	N/A

The figure below depicts historic GHG emissions, forecasted emissions, and target emissions from 2010 to 2030.



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 Centre Region for the anticipated impacts of climate change. In addition, the Centre Region will assist residents and businesses in their endeavors to reduce emissions through actions identified in this Plan. By working together, our community can not only do its part toward achieving a stable climate - we can also 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.

For more information on the GHG emissions inventory results and methodology see full report in the *Appendix: Weblinks for Additional Information.*

CLIMATE VULNERABILITIES & ADAPTATION

Even if we halt all carbon emissions today, the carbon emissions currently in the atmosphere will continue to impact the climate. Local governments have a key role to play in adaptation: preparing people for floods, storms, heat waves, and other impacts of climate change. Addressing climate change head-on through this Climate Action and Adaptation Plan will not only help the region take important steps to mitigate climate change, but will also provide numerous economic and environmental benefits to our community members that are more equitably distributed.

Preparing for climate change

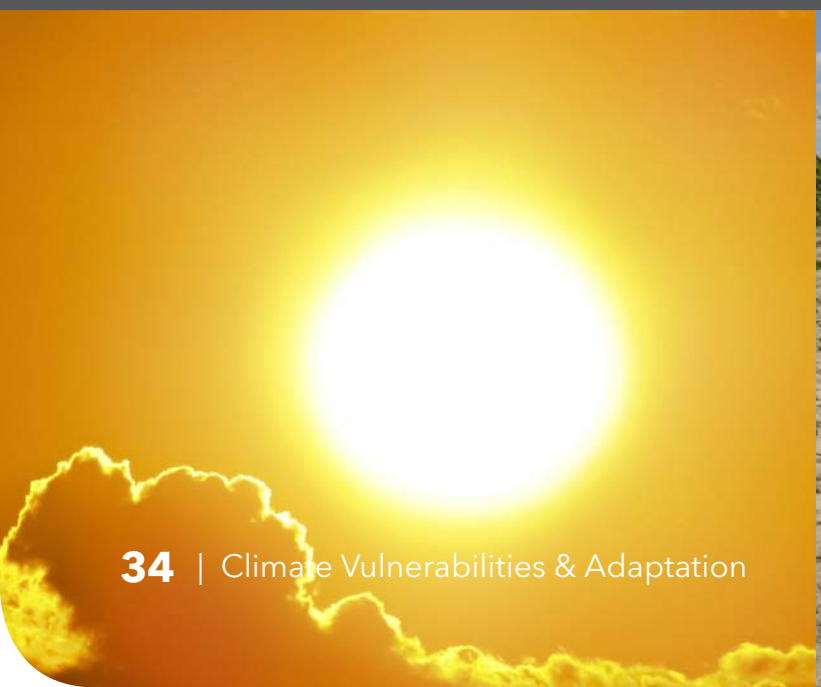
Preparing for the impacts of climate change is a complex challenge. Climate science is evolving and is complicated by the uncertainty of future global emissions levels. Therefore, the Centre Region's preparedness strategy needs to be an evolving one as well. The systems, plans, and infrastructure put in place to enhance resilience to climate impacts must be grounded in the best available science of the time and frequently re-evaluated as new information becomes available.

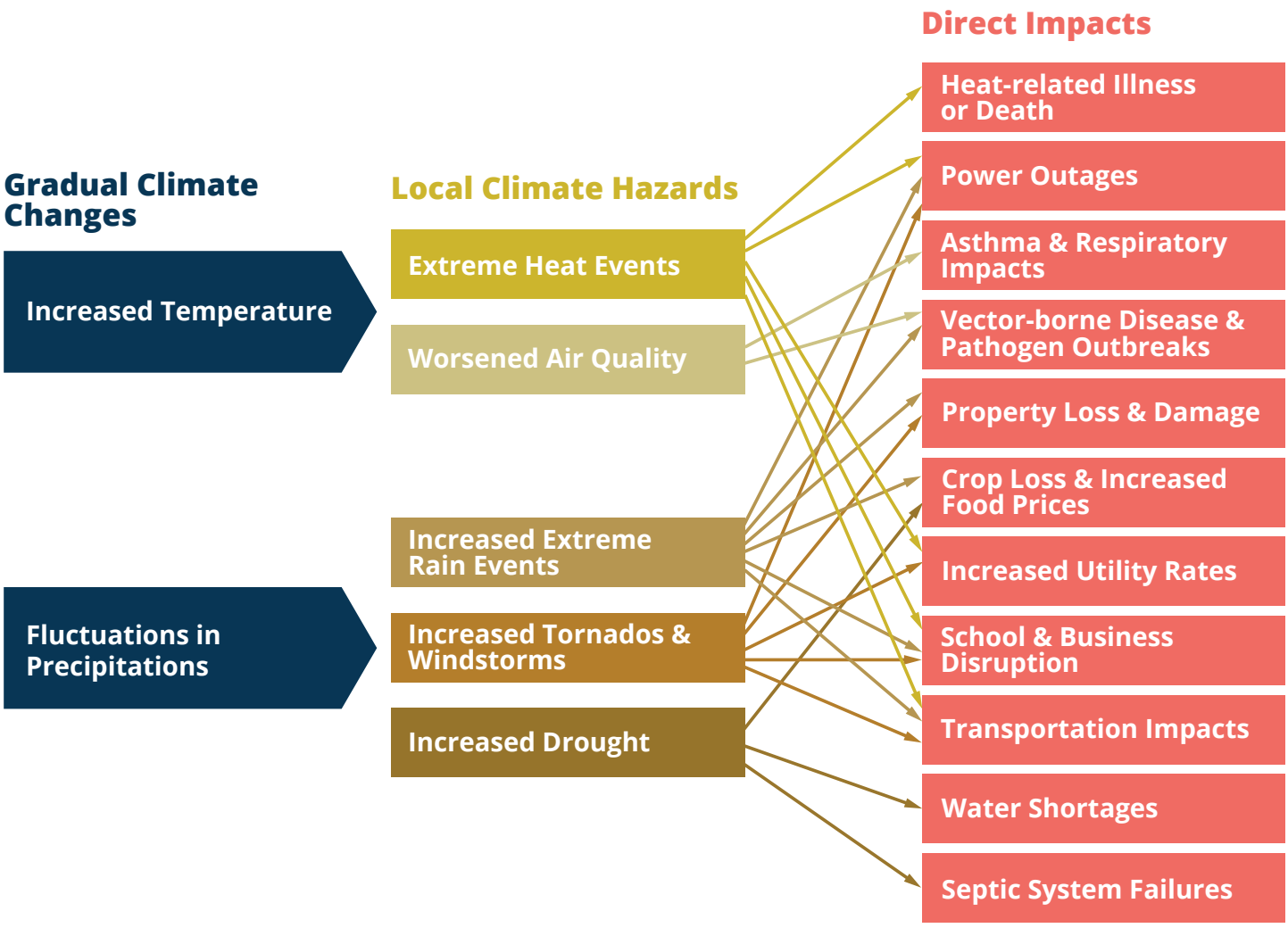
Proactive planning for impacts can be more cost-effective than a reactive approach of responding to damage after the fact. Proactive planning can help ensure the Region's infrastructure and systems continue to function as climate conditions change. This type of planning may mean designing for projected future conditions now or anticipating the need for later modifications or operational changes. For example, designing bridge expansion joints for projected future temperature extremes may be a cost-effective way to prepare now for future temperatures, because retrofitting a bridge is challenging and costly and failure of an expansion joint could result in traffic delays and damage.

In other situations, the lack of certainty about the timing and magnitude of future impacts may mean that it is more cost effective to design a project to allow for future modifications, once potential impacts are more certain. For example, a current roadway stormwater system can be designed to allow future modification to accommodate additional precipitation. To be most effective, climate change preparedness requires project and program-specific decisions that require a broad understanding of the impacts of climate change.

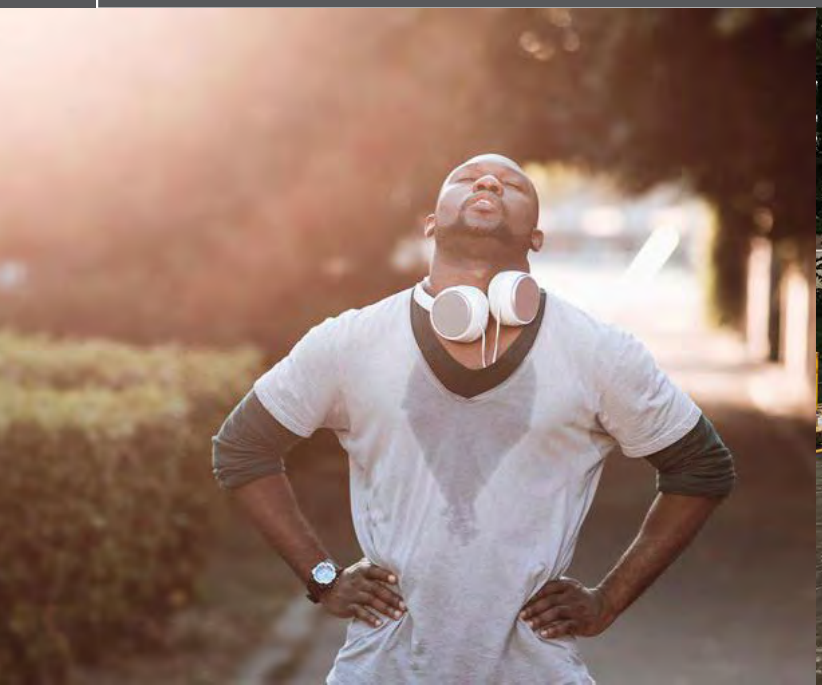
Climate change is likely to amplify the impacts of existing inequities so the Centre Region's resilience efforts will prioritize actions that help vulnerable populations to moderate potential impacts and to cope with the consequences of climate change.

Anticipated Climate Hazards and Impacts





Increasing Vulnerabilities



Vulnerability Assessment

While CRCOG did not have the capacity to complete a robust climate vulnerability assessment for the Centre Region there have been two relevant events that can be used to educate the public on local impacts and inform future efforts:

- Centre County 2021 Hazard Mitigation Plan (HMP) Update
- Ferguson Township's Community Resiliency Building (CRB) Workshop held on April 28, 2021.

CRCOG participated in both exercises and the outcomes guided the resiliency objectives and actions included in the plan.

Vulnerabilities

Based on the outcomes of the HMP and CRB Workshop, the following vulnerabilities rise to the forefront. These vulnerabilities have a direct correlation to our economy and community welfare. If these systems are temporarily or permanently impacted, not only could employers and employees be exposed to dangerous conditions, but businesses could lose revenue in the short term or move away in the long term.

Infrastructure: Centre Region's energy, transportation, water, and communication systems are essential to keeping the Region running. Ensuring the resilience of these systems to future changes in climate is a priority for the Region.

- A top vulnerability is our aging electric grid and continuing to partner with our utility provider, West Penn Power will be key to reducing this risk.
- Transportation vulnerabilities includes traffic disruptions and infrastructure repairs to our roads, bridges, storm management systems and drainage ditches. Proactive planning for future climate change will be help reduce the cost and risk in the long term.
- Multi-year droughts could put our public water supply at risk, but our public water authorities continue to plan and prepare for drought scenarios. A greater concern are the homes with private wells. Additionally, homes with septic systems could be negatively impacted by long term drought conditions.
- In a long-term power outage situation, our communication systems would be a vulnerability with cascading effects. A lack of broadband and phone service would severely impede efforts to ensure the community is safe.

Community and People: Social equity is a major concern for addressing climate change. Research shows that vulnerable populations such as the elderly or chronically ill, the poor and people of color are more at risk when it comes to experiencing impacts of climate change. These communities already experience institutional and systematic oppression that result in less access to resources, capital, and services. Climate change exacerbates these gaps. By targeting programs and making changes to services or infrastructure before extreme events happen, we can mitigate the most devastating impacts to already vulnerable populations. This can range from connecting residents to emergency resources and information, preventing physical harm or illness, and making sure that no one is left behind.

An estimated 45% of the Centre County population is vulnerable to displacement from natural causes according to the Centre County United Way. Emergency management and community organizations need to continue to work together to determine who is not being reached in emergency preparedness outreach. We need to expand networks to reach those who speak English as a second language and other vulnerable populations to help ensure they have the tools and information needed to be adequately prepared for extreme weather events.

The Centre Region is also likely to continue to grow and be a location for climate refugees as the impacts of climate change affect the coastal communities and other regions more severely. Proactive planning will help ensure that our infrastructure, community resources and facilities, and land use practices meet the demands of growth while being sustainable and resilient for future generations.

Natural Resources: Many of the Centre Region's natural systems and surrounding natural areas will be impacted by climate change, threatening the ecosystem services they provide such as water filtration, flood abatement, pollination, recreation, and fire protection. Impacts are already present in species like Hemlocks. The effects of climate change on natural systems are interrelated and may compound each other.

Pests and pathogens will have a significant impact on trees, wildlife and food crops. Our watershed (streams, creeks, wetlands) will be impacted by climate change in the form of warmer waters, erosion, and flooding. Local government will continue to collaborate with community partners to support their efforts to protect our natural systems, while using best practices to protect their municipal public parks and open spaces.

Resilience and Climate Preparation

To maximize future resilience outcomes, the full array of local plans and planning functions—including community visioning and public outreach, hazard mitigation planning, climate adaptation planning, open space planning, and many others—must be aligned, with goals and objectives clearly linked to actions and outcomes.

Prepare for the Future

Add climate and flood resilience policies to Comprehensive Plan + **Use Comprehensive Plan to inform capital improvement plan priorities** = **Public investments yield more resilient infrastructure**

Another key component to resiliency is building readiness and preparedness in our community. Readiness is a shared awareness and concern by all community members to collectively be able to implement actions to reduce GHG emissions and prepare for the changing climate. Community members told us they want policy makers to shift away from reacting to disasters to being proactive. Our local governments can help with community- driven planning efforts focused on developing adaptive measures to reduce our community's vulnerability to extreme weather. Enhancing preparedness means we need to understand the potential impacts on the community and provide tools so businesses and residents can be less exposed to risk and quicker to recover. Community-focused outreach and workshops can identify the vulnerabilities and actions needed to create a climate ready community.

> The good news is that adaptation, done right, will lead to better growth and development. It will also protect nature, reduce inequalities, and create opportunities.

Municipal Leadership

Building Community Preparedness

The Centre Region is fortunate to have a regional emergency management program. This program, which is comprised of the six member municipalities of CRCOG and Penn State University, allows for pooling of resources and ensures a coordinated response to emergency events. The Centre Region Emergency Management program employs a full-time coordinator, a part-time deputy coordinator, and taps into the resources in the local municipalities to staff a public information arm.

During the pandemic, the program became a vital piece of the response in the Region, providing resources to the hospital, helping to obtain personal protective equipment for the local municipalities, and being a trusted source of virus-related information for residents via its social media outlets. Having this program in place has proven effective to increase community and individual preparedness.

More information on the program can be found at: https://www.crcog.net/em. It can also be found on facebook at: www.facebook.com/centreregionready and on Twitter at: @cremalerts.

PLAN DEVELOPMENT

The Centre Region municipalities are joining an increasing number of local governments committed to addressing climate change at the local level. **The Centre Region Climate Action and Adaptation Plan (CAAP)** provides a roadmap for our region to sustain economic, social, and environmental prosperity for current and future generations of residents and visitors. It represents the beginning of an ongoing and evolving process.

Local government recognizes the risk that climate change poses to our residents and businesses and is acting now to prepare our community to adapt and to reduce the greenhouse gas (GHG) emissions of both our government operations and our community at-large through the innovative strategies laid out in the CAAP.

The CAAP identifies pragmatic, fiscally responsible, and equitable actions that our local government can 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 all six Centre Region municipalities for years to come.


GRILL
CORNER

Scope of the Climate Action and Adaptation Plan

The Climate Action and Adaptation Plan (CAAP) covers objectives and actions for reducing GHG emissions resulting from local government and community-wide activities within the Centre Region. Pennsylvania State University is a participating partner in our work towards a more resilient community. Their emissions and activities are accounted for separately in the University's Climate Action Plan: http://sustainability.psu.edu/climate-action.

The CAAP addresses the major sources of emissions in the region and sets forth objectives and actions in the following six sectors that both municipal governments and community members can implement together to reduce greenhouse gas (GHG) emissions:

- **Energy & Buildings**
- **Renewable Energy**
- **SustainableTransportation**
- **Solid Waste**
- **Land Management**
- **Clean Healthy Water**

Planning Process

The six Centre Region municipalities each recognize that this plan is a critical component of a comprehensive approach to reduce our emissions and adapt our systems and infrastructure to new climate conditions. CRCOG launched the climate action planning process in 2019 with these two actions:

1. Climate Action and Adaptation Technical Advisory Group (TAG)

The General Forum authorized the formation of the TAG in June 2019. TAG was designed to provide technical assistance to the Sustainability Planner and the relevant CRCOG Committees during preparation of the CAAP. The TAG has been meeting monthly and holding sessions with subject matter experts to discuss best available science and best practices to inform the CAAP.

Name	Organization
Brandi Robinson, Chair	PSU Assistant Teaching Professor, Energy and Mineral Engineering
Peter Buck, Vice-Chair	PSU Sustainability Institute Academic Programs Manager
Pam Adams	COG's Centre Regional Planning Agency Sustainability Planner
Franklin Eagan	PASA Sustainable Agriculture Director of Education
Alan Sam	State College Borough Environmental Coordinator/Arborist (retired March 2021)
Jasmine Fields	State College Borough Sustainability Coordinator (joined March 2021)
Jason Wert	Rettew Renewable Market Leader
Adam Brumbaugh, Advisor	College Township Manager

2. PA Department of Environmental Protection (DEP) Local Climate Action Program (LCAP)

Along with a cohort of 19 other jurisdictions across Pennsylvania, the Centre Region participated in the first LCAP from July 2019 – June 2020. College students, matched with staff from each jurisdiction, and trained by ICLEI-Local Government for Sustainability assist with each component of the climate action planning process. Staff and students worked together to complete a GHG emissions inventory and prepare a draft climate action plan framework. 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 Centre Region has a tradition of responsible stewardship, prudent fiscal accountability, and inclusive local government and community practices. All six Centre Region municipalities are Sustainable Pennsylvania certified, a recognition for the policy and practice of sustainability as their way of operating to advance community prosperity. State College Borough, Ferguson Township and Harris Township have passed resolutions committing to develop a strategy to achieve net zero GHG emissions.

Milestones for the Climate Action and Adaptation Plan (CAAP)

While the Centre Region has already begun to reduce GHG emissions and climate risk through a variety of actions, the CAAP is a critical component of a comprehensive approach to make our community more resilient. We identified seven milestones to guide the Centre Region's climate action and adaptation planning process. The planning process was based on the overarching framework developed by ICLEI – Local Government for Sustainability. As indicated by the figure to the right, climate action planning is a continuing cycle and does not stop with the development of this document.

This CAAP is a product from completing the five milestones of the first regional planning cycle.

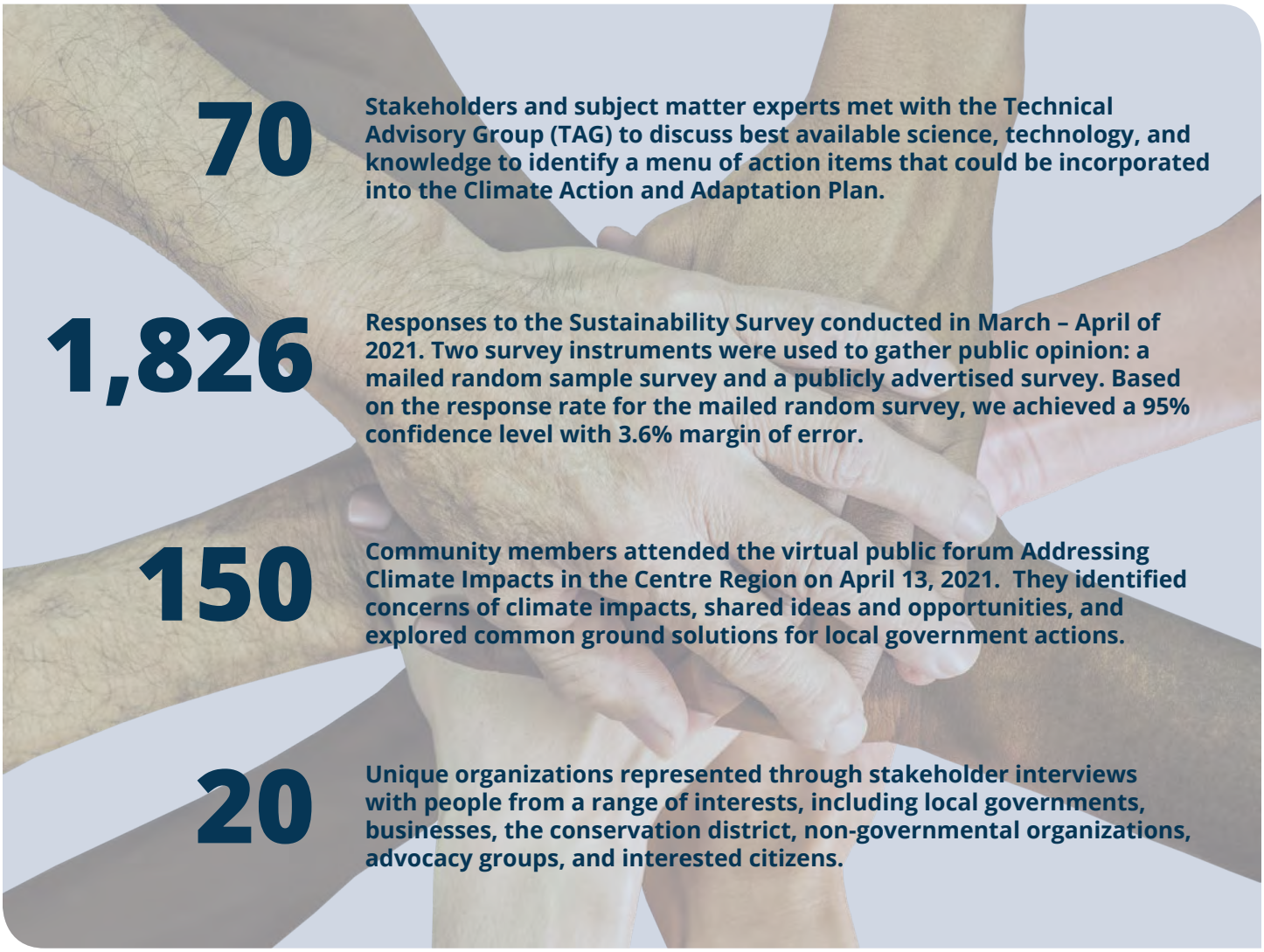
March 2020	**Milestone #1**	We completed a community inventory of GHG emissions (2016 data).
July 2020	**Milestone #2**	General Forum passed Resolution 2020-1 which set climate goals and targets for the region.
May 2020 – April 2021	**Milestone #3**	CRCOG participated in the Centre County 2021 Hazard Mitigation Plan Update and the Ferguson Township Community Resilience Building Workshop.
May 2020 – April 2021	**Milestone #4**	Used public engagement tools to help prioritize actions
TBD	**Milestone #5**	CAAP Adoption by all six municipalities.

Centre Region Climate Action and Adaptation Plan (CAAP) Engagement

Goals of community engagement:

- Promote an understanding of the purpose and motivation for the creation of the CAAP.
- Build broader ownership of the decisions that must be made.
- Use the input to guide decision making and prioritization of strategies to include in the CAAP.
- Enhance community readiness and resilience.

The Centre Region Climate Action and Adaptation Plan represents the culmination of a year-long process of engagement, input, and review. Effective climate mitigation and adaptation plans are not possible without active support of key stakeholders and engagement with the public. Many individuals and organizations played a role in shaping this plan. Some of the highlights include:



70 **Stakeholders and subject matter experts met with the Technical Advisory Group (TAG) to discuss best available science, technology, and knowledge to identify a menu of action items that could be incorporated into the Climate Action and Adaptation Plan.**

1,826 **Responses to the Sustainability Survey conducted in March – April of 2021. Two survey instruments were used to gather public opinion: a mailed random sample survey and a publicly advertised survey. Based on the response rate for the mailed random survey, we achieved a 95% confidence level with 3.6% margin of error.**

150 **Community members attended the virtual public forum Addressing Climate Impacts in the Centre Region on April 13, 2021. They identified concerns of climate impacts, shared ideas and opportunities, and explored common ground solutions for local government actions.**

20 **Unique organizations represented through stakeholder interviews with people from a range of interests, including local governments, businesses, the conservation district, non-governmental organizations, advocacy groups, and interested citizens.**

Guiding Principles

Building a sustainable and resilient community that is both equitable and prosperous requires significant structural shifts in governance, business leadership, and community stewardship to support whole systems approaches.

Our plan is guided by four principles:

1. Local Leadership

Community wide action will be needed to meet the goals and targets defined in this plan and leadership from our local government, businesses, and organizations can demonstrate the long-term benefits to sustainable practices. The Centre Region municipalities will continue to lead by example, while serving as a catalyst for broader community action. Local governments have an indispensable role to play as well in developing the fundamental shape of the community, transportation systems and buildings. With the creation of the regional CAAP, local governments can help accelerate progress in a more coordinated manner and help the region achieve even more significant outcomes.

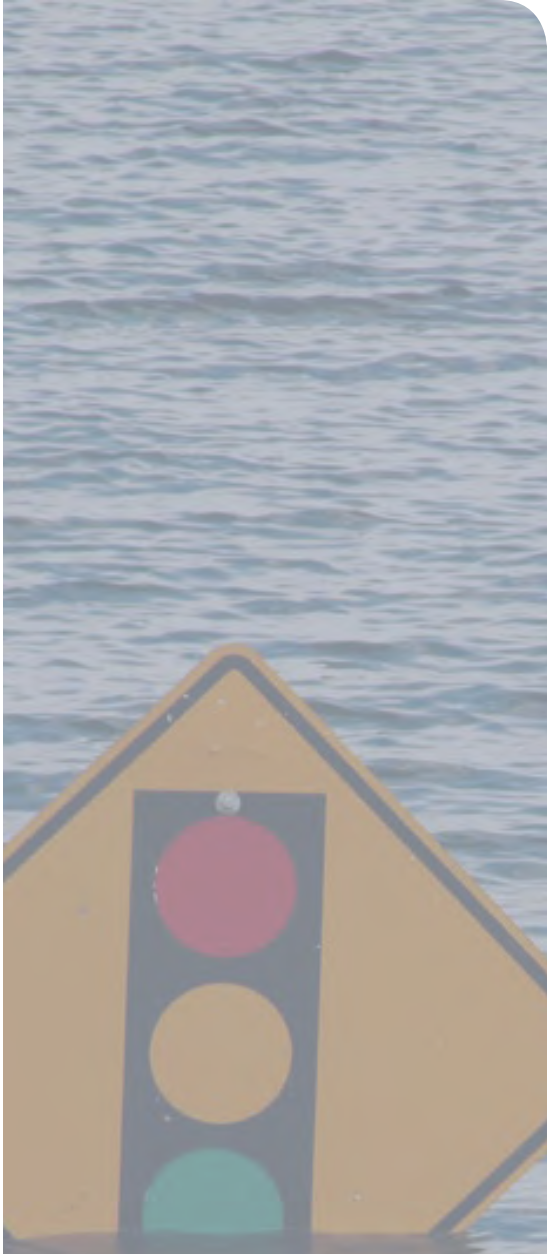
We prioritized fiscal responsibility, good governance, and transparency throughout the CAAP development. The plan was created with the input from many stakeholders and community members despite obstacles from the Covid-19 pandemic. Many of the recommended policies and programs, if properly implemented, could lead to cost savings as well as economic growth and job creation. In evaluating the cost-effectiveness and affordability of actions, CRCOG will work to incorporate the cost of inaction as well. The social and economic cost of climate and resilience inaction is considerable.

2. Partnerships

We must all work together to achieve the goals defined in this plan. Local government's limited direct influence on GHG emissions will require the development of partnerships with other governmental entities, businesses, community organizations, schools, and residents to encourage local action across the community.

Cooperation and collaboration across sectors, organizations, and communities will create a shared awareness and concern as well as a collective commitment to fund resources needed to implement solutions. Local coordination could in turn help leverage potential funding sources and strengthen advocacy at state and federal levels.

Through comprehensive approaches, our community will be better suited to find solutions that work in concert to ensure equity and the sustainability of resources such as food, water, energy, transportation, land-use, housing, and economic opportunity, that are essential to community health.



Through public engagement, we heard that policy makers should:

- **consider scientific projections about the climate in 50 years**
- **shift away from reacting to disasters to being proactive**

3. Social Equity

Climate change affects everyone; however, not all people are equally impacted. Today – and historically - communities of color, immigrants, the elderly, the disabled, as well as low-income and other at-risk populations experience increased exposure to environmental and climate hazards and a reduced capacity to adapt. This plan advocates for intentional policies, programs, and budgets that recognizes the livelihoods of marginalized people.

The planning process incorporated climate equity as a value and it will continue to occupy an important place throughout the CAAP implementation. While developing the plan we imperfectly sought the involvement and representation of all members of our community to address the social, economic, and ecological impacts of climate change. The plan's implementation should continue and deepen this commitment, particularly by engaging with traditionally marginalized communities.

4. Resilience and Climate Preparation

The CAAP is a framework for our community to minimize and prepare for the impacts of climate change. Building a resilient community includes:

- physical resilience in our region's infrastructure and resources,
- social resilience in our community and network of residents, and
- economic resilience in our businesses and connections to the broader regional economy.

The plan is intended to provide a common course of action so that all community members have a role in creating and achieving climate and sustainability goals.

[Climate] Resilience: the capacity of a community to anticipate, plan for, and mitigate the risks—and seize the opportunities—associated with environmental and social change.

Plan Framework

This Plan offers a robust set of objectives and actions that will address the climate hazard vulnerabilities and aim for a 45% reduction in GHG emissions by 2030. 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 hurdles.

The main components of the CAAP are:

Sectors - are the main themes and organizing structure of the Climate Action and Adaptation Plan. They include:

- **Energy & Buildings**
- **Renewable Energy**
- **SustainableTransportation**
- **Solid Waste**
- **Land Management**
- **Clean Healthy Water**

Goals

embody the desired outcomes that the Centre Region intends to achieve for each sector. Where applicable, goals include numeric targets and time frames for achieving these targets. In other instances, goals are more qualitative but still articulate a desired future end state.

Objective 1 **Objective 2** **Objective 3**

Objectives

summarize what the Centre Region community plans to achieve and are used to organize the various Actions. There are 23 Objectives across the six sectors.

Actions

consist of specific strategies that will be implemented to meet the Goals and Objectives. For any given Goal there are generally several supporting Actions.

Potential Impacts

While quantifying the potential impacts of any action can be challenging, it is possible to look at the relative contribution of each action within its respective sector to help evaluate overall impact and establish priorities for implementation. Calculating expected impacts for each action requires making assumptions about the 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 numbers to each action. To address this uncertainty and provide a simple but useful reference for impact potential, a series of symbols has been devised to represent the potential impact associated with each action.

Decrease Emissions	Impact	Improve Resiliency
🍃	Small Impact	♻
🍃🍃	Moderate Impact	♻♻
🍃🍃🍃	Significant Impact	♻♻♻

Currently there is less available data on resiliency potential impacts. So while many actions in this plan could contribute to resiliency, only those connected with best practices of improving community resiliency receive a symbol.

Evaluating Co-Benefits

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

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

Community Leadership

Solar Power Purchase Agreement Working Group

Six municipalities, six authorities, the council of governments, the school district, and the county government have formed a working group to explore a joint solar power purchase agreement (SPPA). A SPPA is when buyers purchase electricity from a utility-scale, off-site renewable energy generator to use at their facilities. The group is driven by a desire to reduce electricity-related costs and greenhouse gas emissions, and to increase intergovernmental cooperation.

By partnering, the group can more effectively investigate if an SPPA is fiscally responsible by sharing technical resources and distributing costs. The group has hired an energy services consultant. The consultant will assist the group as members consider combining a portion of their respective electricity usage and purchase those portions from a large-scale solar facility.

The State College Borough Water Authority (SCBWA) is leading the way and has already committed to purchase all their power through the SPPA if it progresses. Brian Heiser, the SCBWA Executive Director, stated, “In addition to saving on our own energy costs, we are hopeful that a large purchase through the SPPA will help everyone who is involved in the SPPA save on energy.”

Organizations in the SPPA WG:

- Borough of State College
- College Township
- Ferguson Township
- Halfmoon Township
- Harris Township
- Patton Township
- Centre Region Council of Governments (CRCOG)
- State College School District (SCASD)
- State College Borough Water Authority (SCBWA)
- College Township Water Authority (CTWA)
- Centre County Government
- Centre County Refuse & Recycling Authority (CCRRA)
- Centre County Housing Authority
- Centre Area Transportation Authority (CATA)
- Centre Hall Potter Joint Authority

TAKING ACTION

In the following chapters, objectives and their supporting actions are organized by the following sectors. Some actions cut across sectors to deliver multiple benefits to more than one sector.

- **Energy & Buildings**
- **Renewable Energy**
- **SustainableTransportation**
- **Solid Waste**
- **Land Management**
- **Clean Healthy Water**

This Climate Action and Adaption Plan builds upon existing policies and programs by including best practices gathered from local and national subject matter experts. Several actions are already being implemented, and other complementary actions can be undertaken next to have cumulative effects. Some actions will require a longer timeframe to implement.

Local government's role is to lead by example, foster partnerships, create policy and help disseminate information. This plan will be most useful and effective if our community works together to reach our climate goals of reducing emissions and adapting to the changing climate.

"The secret of change is to focus all of your energy, not on fighting the old, but on building the new."

~Socrates

ENERGY & BUILDINGS

GOAL: Achieve building efficiencies to reduce energy consumption by 30% for homes and 25% for businesses.

67%

Residential (35%) and Commercial (32%) buildings combined contribute 67% of community GHG emissions

GOAL: Achieve building efficiencies to reduce energy consumption by 30% for homes and 25% for businesses.

The CRCOG estimates that energy consumption in residential and commercial buildings account for 67% of the Centre Region's total greenhouse gas (GHG) emissions making this the largest sources of emissions. Individually, 79% of our emissions come from electricity consumption, 14% from natural gas consumption, and the remaining 7% from other stationary combustion fuels such as fuel oil and propane. This represents a significant opportunity to reduce emissions and help our community meet its reduction targets.

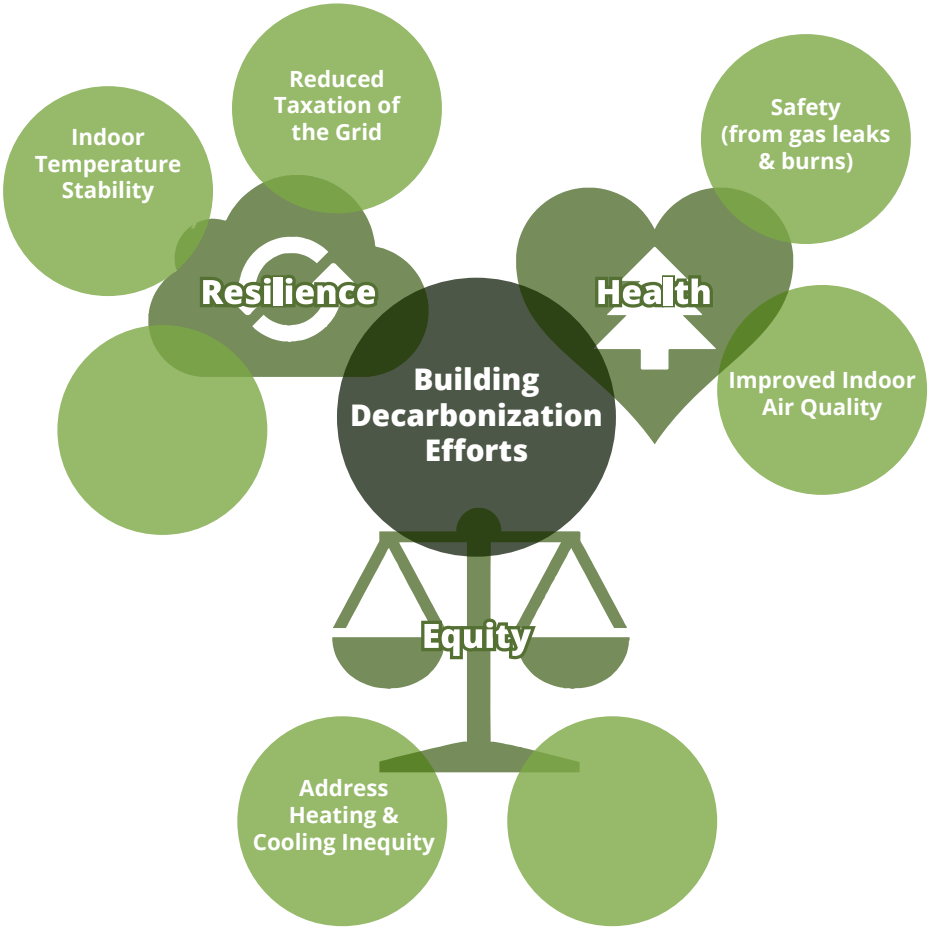
Reducing energy consumption will require action on all fronts, meaning that reductions will need to come from existing buildings—most of which will still be standing in 2050—as well as new buildings. Installing efficient lighting, heating, ventilation, and air conditioning (HVAC) systems, windows and insulation, and other upgrades can significantly reduce energy use. The business case for energy efficiency and green buildings is strong. It would lower utility and maintenance costs, lessen risk from energy price volatility, increase property values, improve health and productivity of occupants, and create local jobs.

We need participation from all building sectors, the involvement of many stakeholders, identification and facilitation of financial partners and incentives, and coordination and leadership by local municipal government. To comprehensively tackle inefficient energy use scaling up green building practices across our community is critical.

Building Decarbonization Efforts Also Impact:

Resilience • Equity • Health

Transforming our energy systems away from fossil fuel combustion and reducing our energy consumption improve the everyday resiliency of households and businesses. Energy efficient buildings make utility bills more affordable, homes and workplaces healthier, and provides havens during power disruptions. Energy efficiency measures can also help utilities avoid or delay investments in new generation, transmission, and distribution capacity. This in turn helps keep electricity rates low.



Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate building energy efficiency programs through education, partnerships, and policy.

Potential Indicators

- **Commercial and residential building energy use and associated emissions.**
- **Proportion of buildings that use heat-resistant materials, passive building techniques, and/or white roofs.**

Co-Benefits

$ Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Improve energy efficiency best practices in existing buildings

Energy efficiency and conservation measures reduce consumption while lowering operating costs and improving occupants' comfort. For broad community-wide adoption, owners of properties of all sizes can engage in a comprehensive approach that focuses on the most cost-effective improvements. These might include improvements in lighting, air sealing and insulation, efficient heating and cooling equipment, sensors, and replacement of gas appliances with electric. . Local government will coordinate with partners to engage homeowners and businesses to educate and provide the tools and incentives needed to implement these improvements.

Action	Co-Benefits	Potential Impact
1.1 Promote programs, provide tools and encourage **commercial building** owners to track energy consumption, conduct energy audits, provide preventative maintenance, and commission / retro commission buildings.	$	
1.2 Promote programs, provide tools and encourage **residential building** owners to conduct energy audits, track energy consumption, and provide preventative maintenance.	$	
1.3 Promote programs, provide tools and encourage strategies that reduce energy efficiency barriers in **rent/lease** properties.	$	

Objectives & Actions *continued*

2. Increase the number of new buildings and homes that are net zero energy ready, affordable, and resilient

The Centre Region is a growing community, and any new buildings should be as efficient as possible. Modern green building standards not only focus on ensuring an energy efficient building, but also an environment that promotes well-being. Buildings that meet these standards are less expensive to operate and maintain, improve employee retention, and lead to healthier and more productive occupants.

Action	Co-Benefits	Potential Impact
2.1 Advocate at the state and federal level for stronger and cleaner energy codes.		
2.2 Support building energy code compliance.		
2.3 Advance policies for building designs that perform better than code requirements for energy efficiency, electrification, and renewable energy.		
2.4 Support partners in developing an affordable housing plan.		
2.5 Educate about and address urban heat island effects.		

3. Maximize efficiency of municipal facilities, equipment and operations

While municipal and CRCOG operations are only 1% of the community's total emission, local government plays a key role in building momentum for community wide action. Understanding local government's energy demands and creating a comprehensive energy plan that addresses energy efficiency, clean renewable energy, and electrification will provide a more strategic path forward for maximizing societal benefits and achieving climate goals throughout the community.

Action	Co-Benefits	Potential Impact
3.1 Designate an energy coordinator at each municipality.	$	
3.2 Establish an energy management plan for public facilities that includes energy audits, benchmarking, and renewable energy.	$	
3.3 Consider an ordinance for all new municipal buildings to meet high performance building standards, such as Leadership in Energy and Environmental Design (LEED) certification, ENERGY STAR, or net zero energy ready standard.	$	

4. Enhance resiliency throughout the community

Implementing best practices of energy efficiency and resiliency are integral to a community's ability to respond during extreme weather events. Advancing climate preparedness and resiliency actions will require a community-driven process that engages multiple stakeholders including vulnerable populations. Local government can promote actions that help adapt buildings to withstand climate impacts such as extreme heat and power outages, as well as protect building dwellers and visitors through improved design and functionality.

Action	Co-Benefits	Potential Impact
4.1 Complete regional community resiliency building workshops that engage stakeholders and the public to strengthen preparedness and readiness.		
4.2 Set performance goals for vital social functions—healthcare, education, and public safety—and supporting infrastructure systems.	$	
4.3 Integrate resiliency goals into community comprehensive, land-use, hazard mitigation, economic, and other development plans.	$	

Community Leadership

High Performance Building Standards

State College Area School District's newest seven schools have been built to meet Leadership in Energy and Environmental Design (LEED) standards. Ferguson Township and Mount Nittany Elementary are LEED Silver. State High and Delta are LEED Gold Certified. Corl Street, Radio Park, and Spring Creek elementary schools are LEED Platinum Certified, the highest level shared by only three other schools in Pennsylvania.

What does LEED certification mean? As a result of designs and materials that promote conservation, the buildings save energy. Spring Creek's usage, for example, has been reduced 58 percent. Four schools have rooftop solar arrays that supply a portion their electricity demands. Each building conserves water. As an example, State High has reduced its consumption 46 percent. Stormwater runoff is limited as well. Recycled materials comprise of 24 percent of the buildings, and 35 percent of materials came from regional sources to support local industry and limit transportation[10].

"In addition to energy efficiency, the LEED building process also prioritized abundant windows for daylight and healthy ventilation systems," Board President Amber Concepcion says. "These ventilation systems are a critical part to our success of keeping teachers and students safe and in the classroom during the COVID-19 pandemic."

The district's combined fiduciary and environmental focus was set in 2008, when the Board of Directors adopted a sustainability resolution to build schools that minimize operating costs and environmental impacts while providing state-of-the-art learning environments for students.


STATE COLLEGE AREA HIGH SCHOOL

RENEWABLE ENERGY

GOAL: Transition fossil sources to renewables for 10% homes' and 5% businesses' energy usage.

GOAL: Transition fossil sources to renewables for 10% homes' and 5% businesses' energy usage.

Renewable energy combined with energy efficiency and conservation provide the region with its greatest opportunity to reduce our greenhouse gas emissions and make our community more resilient. Solar is the most suited renewable energy source for our region, but on a larger scale across the state, it also includes wind, hydro, biomass, methane, solid waste, and wood. Solar generation is the fastest growing electricity source because of the environmental as well as economic benefits. Policies have been created that levelized the cost of energy production across fuel types in certain regions, allowing renewable energy to compete economically. In the U.S., the price of solar power has decreased 70 percent over the last decade[11].

Although solar photovoltaic installations are increasing in Pennsylvania, solar currently produces less than 1 percent of the state's net electricity generation[12]. Most of the community's greenhouse gas GHG emissions, 88%, come from fossil fuel combustion for electricity, heating, transportation, and other energy-producing uses. The actions within this sector are designed to spur local government and community investment in renewable energy sources. Making homes and buildings more efficient and able to produce their own energy on-site are critical actions for a more resilient community. Energy efficiency and renewable energy contribute to:

- Less air pollution
- Better respiratory health
- Lower energy costs for households and businesses
- Stimulate job growth in related fields

Recognizing that a large amount of our energy comes from utilities, collaboration, technology and innovation will continue to drive the transformation to a low-carbon energy system. Local government can take part in this initiative and help prepare its community for the changing energy systems.

Financing Mechanisms Supporting Solar Energy

Solar for BUSINESSES

Federal tax benefits can reduce the cost of solar by around 50%

- 26% Federal investment tax credit
- C-PACE: Commercial Property Assessed Clean Energy financing - covers 100% of costs with competitive, fixed interest rates
- Depreciate 100% of the costs in year 1 (MACRS)

Solar for RESIDENTS

The average solar purchaser sees a return on their investment (ROI) of 20% or more

- 26% Federal investment tax credit
- Centre County Solar Co-op (September 2021– January 2022) - save money with a bulk discount by going solar in a group
- Solar can potentially increase the home's value by up to 4.1%

Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate renewable energy adoption through education, partnerships, and policy.

Potential Indicators

- **Commercial and residential building energy use and associated emissions.**
- **Proportion of buildings that use heat-resistant materials, passive buildings, and/or white roofs.**

Co-Benefits

Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Develop a resilient energy portfolio through diversified sources and local generation

One of the major impacts of climate change in the Centre Region is the potential for a greater number of storms and heat waves which can strain the electric grid. Local government can aid in identifying favorable pathways that enhance the use of cleaner fuels and support a more resilient energy infrastructure. One method could be disseminating information to property owners on how to transition from coal and fuel oil to less carbon intensive alternatives. The transition to low-carbon energy will require taking a broad-level approach that engages multiple stakeholders beyond traditional utility boundaries. A resilient energy portfolio can provide energy users with investments that save them money, create local jobs, accelerate local emissions reductions and provide a foundation for future local energy resilience.

Action	Co-Benefits	Potential Impact
1.1 Increase on-site renewable energy systems and electrification		
1.2 Implement recommendations to achieve SolSmart Silver or Gold level certification.		
1.3 Explore municipal resiliency and integration of battery and microgrid technologies for weather resistant operations.		
1.4 Partner with utilities and stakeholders to maintain a high degree of reliability during extreme weather events.		

Objectives & Actions *continued*

2. Improve access to affordable clean energy for residents and small organizations

Generating renewable energy on-site is not always feasible for households and small organizations for a variety of reasons. This objective uses innovative approaches to make renewable energy available to more people and organizations.

Action	Co-Benefits	Potential Impact
2.1 Provide education and outreach to expand participation in cleaner energy sources.		
2.2 Partner on a region-wide solar strategy to expand solar, especially to low- and moderate-income households.		
2.3 Encourage community involvement to explore opportunities to offer solar cooperatives and leasing programs to reduce installation costs for residents and small organizations.		
2.4 Look for opportunities to engage the agricultural community in renewable energy projects, such as solar, solar grazing and biomass energy.		

3. Support clean energy policy and growth

Supporting local generation of renewable energy can have provide significant benefits to property owners and our community such as saving money on utility bills, improving energy security and reducing GHG emissions. While this is important, it is also necessary to spur action at the utility and state level. Increasing the percentage of clean (zero-carbon) energy sources throughout our state can have a far greater impact on reducing the Centre Region's emissions and enhancing our energy security. Currently, it is recognized that renewables alone can't replace the grid's power and that technology needs to continue to advance in batteries, grid modernization and other zero carbon fuel sources such as hydrogen. Supporting renewables along with technological innovation will require advocacy at the state level with policy makers and partnering with our utilities. Coordinating with other communities across Pennsylvania to promote and reinforce standards around clean energy will help create a larger scale discussion to ensure long lasting benefits for all communities. Consideration should also be given to preserving agricultural land, forest land, and valuable habitat.

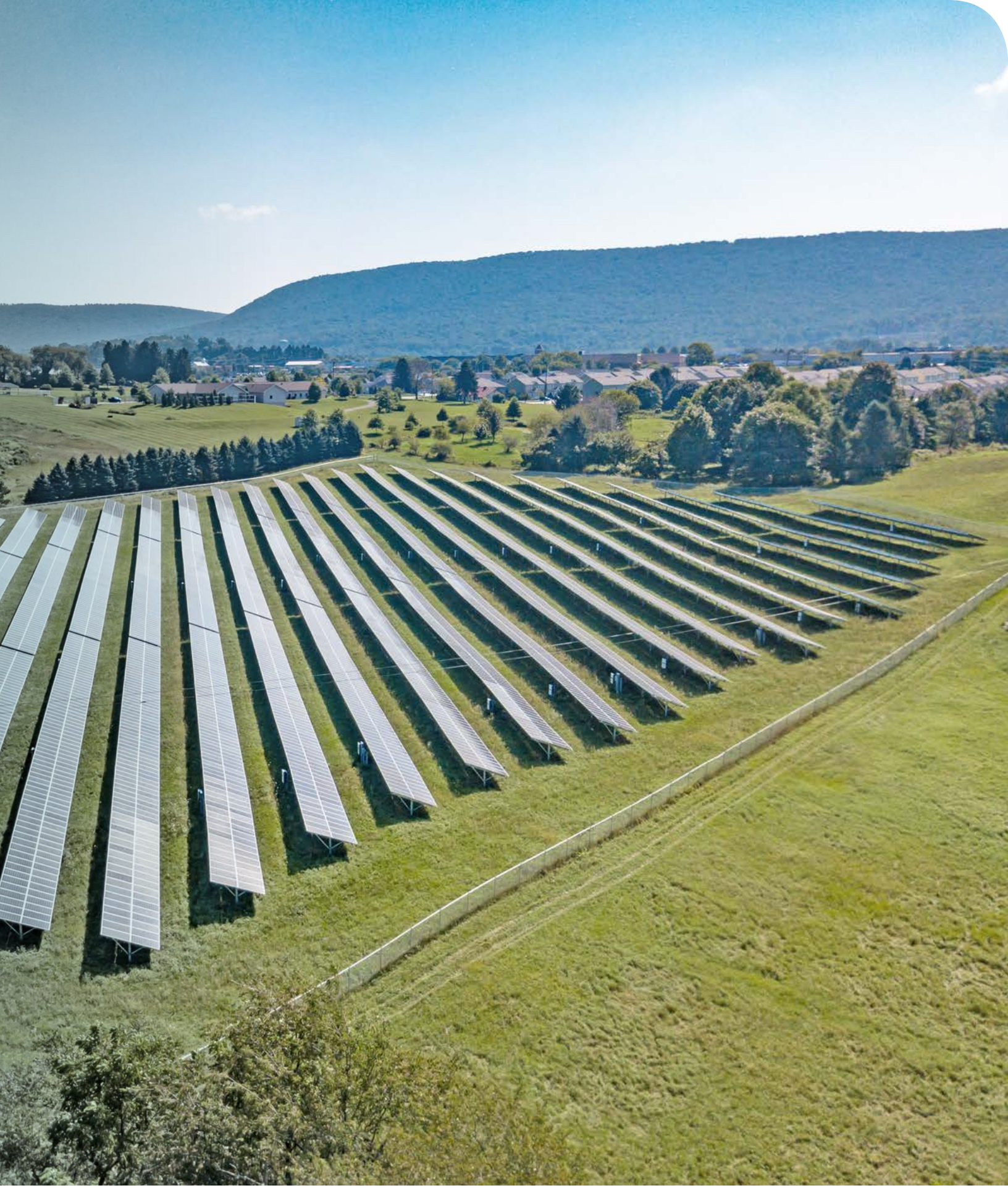
Action	Co-Benefits	Potential Impact
3.1 Advocate for statewide standards to ensure support for energy efficiency, renewable energy, and clean energy.		
3.2 Develop models and toolkits for zoning and development of renewable energy sources.		
3.3 Explore county-wide incentives for clean energy development.		
3.4 Promote solar panel recycling and advocate for federal and state level mandates for recycling.		

Community Leadership

Resilient energy infrastructure

The University Area Joint Authority (UAJA), Pennsylvania State University, the State College Area School District and Centre County Government have all invested significantly in physical infrastructure for renewable energy. In each of these cases, there are millions of dollars in operational savings. The UAJA's combined Phase I and Phase II Solar Projects provide approximately $10 million in savings over 25 years to our community's wastewater facilities.

Operational at the UAJA facility is a 5 MW photovoltaic system (solar array), battery storage and Frequency Regulation System. The array is sized to provide 75% of the facility's electric usage. Power produced by the solar array is fed directly into the treatment plant's electrical systems, displacing grid-based energy. This results in a reduction in the usage and load of fossil fuels at the treatment plant. The battery system will allow the wastewater facilities to continue to operate in future conditions when there are regional power outages.



SUSTAINABLE TRANSPORTATION

GOAL: Increase the trips taken with sustainable options and convert 25% of the communities' vehicles with EVs.

20%

Transportation contributes 20% of community GHG emissions

GOAL: Increase the trips taken with sustainable options and convert 25% of the communities' vehicles with EVs.

Transportation infrastructure shapes our community and underpins everything that we do; the movement of goods and services and the way people travel to work or leisure. Our lives and livelihoods depend on mobility. But transportation fossil fuels also produce a host of criteria air pollutants when combusted, reducing local air quality and affecting our health. Transportation accounts for 20% of the Centre Region's total GHG emissions. Implementing sustainable transportation planning and practices that promotes efficient use of public resources can have positive effects on our community's welfare through improved air quality, more affordable mobility options, and increased active lifestyle habits.

Sustainable transportation in this plan focuses on equity of access, efficiency, safety, and green mobility, as defined in the Global Mobility Report 2017[13]. Municipalities must continue to focus work on transportation initiatives that will improve access and safety for all, increase physical activity, and help stimulate the local economy by reducing transportation costs for residents and making local businesses more accessible.

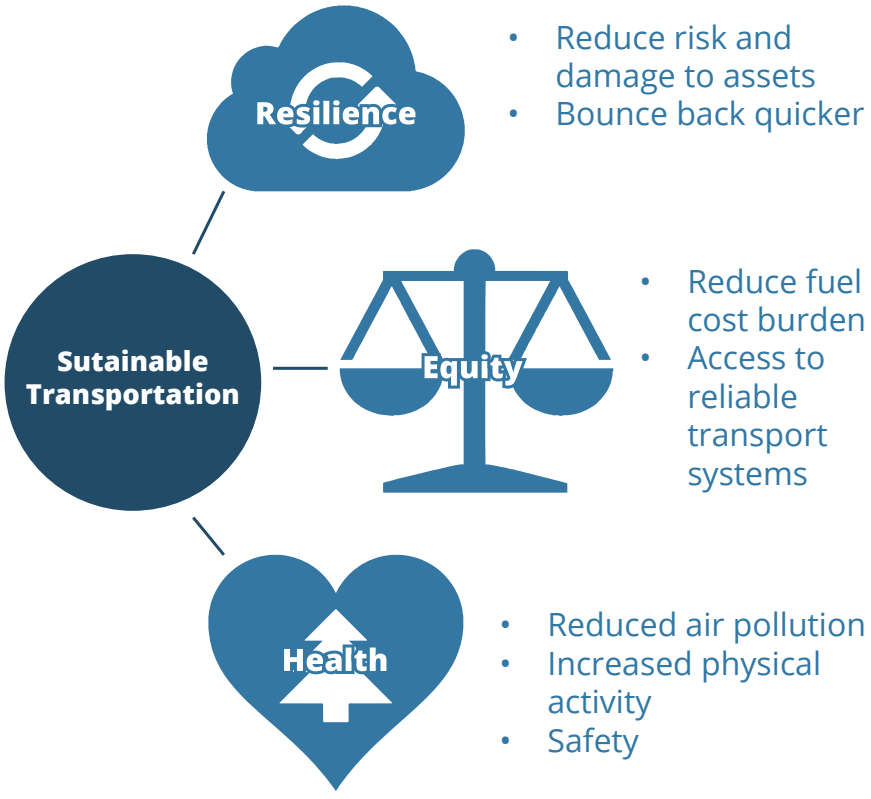
The Centre Region also recognizes the substantial consequences that severe weather events and changes to our climate pose to our local infrastructure, public health, economy and lifestyles. Preparing for climate change and extreme weather events is critical to protecting the integrity of the transportation system and our financial investments.

This chapter focuses on programs and policies to reduce emissions from transportation by shifting to low- and non-polluting modes of transportation, while also being mindful of future land use decisions that impact transportation choices and to build a more resilient transportation system.

Sustainable Transportation Efforts Also Impact

Resilience • Equity • Health

Safe, reliable and accessible transportation systems ensure that more people can get to the places – jobs, education, and health care - they need easily. As we shift our transportation practices to cleaner fueled vehicles and becoming less reliant on personal vehicles, we'll see many valuable benefits beyond the drop in emissions. Walking and biking are transportation choices that promote health and emit no emissions. With fewer cars on the road, there will be less congestion and travel times will decrease. Air quality will improve. Building resiliency into our transport systems will save resources on infrastructure repairs and traffic disruptions.



Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate sustainable transportation programs through education, partnerships, and policy.

Potential Indicators

- **Community vehicle miles traveled**
- **Miles of bike infrastructure**
- **Transit ridership**
- **Number of bicycle friendly businesses**
- **Number of registered electric vehicles (or EVs purchased)**

Co-Benefits

Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Encourage driving cleaner, more efficient vehicles and traffic operations

By supporting programs and policies that expand electric vehicle charging infrastructure and clean vehicle accessibility, our GHG emissions and air pollution can be reduced without requiring significant behavior changes. Local government can lead the way by continuing to transition its fleets to cleaner fuel alternatives, which can also save taxpayer dollars. A 2018 study from the University of Michigan's Transportation Research Institute found that electric cars cost less than half as much to operate as gas-powered cars[14]. A multipronged approach will be needed by all community members that also examines the importance of fleet maintenance and routing for efficient operation, opportunities for shared mobility, and emerging traffic management technologies as they become market ready.

Action	Co-Benefits	Potential Impact
1.1 Create regional strategies to expand electric vehicle (EV) fleets and charging infrastructure.	$	
1.2 Community outreach on purchasing clean vehicles, including incentives.	$	
1.3 Examine strategies for shared mobility and shared micro-mobility.	$	
1.4 Reduce the emissions footprint for municipal vehicles.		

Objectives & Actions *continued*

2. Reduce the trips with one driver

A feasible method of reducing transportation emissions is to increase vehicle occupancy and to make other forms of transportation more desirable. Policies and actions that support less reliance on personal vehicles can translate into less vehicle miles traveled and less emissions. A community that supports public transit, walking and biking not only reduces the need for residents to drive but also offers the public health co-benefit of encouraging active transportation. Community members have voiced a desire for safe and expanded walking and biking infrastructure.

Action	Co-Benefits	Potential Impact
2.1 Implement recommendations to achieve Gold Level of certification as a Bicycle Friendly Community (BFC).		
2.2 Collaborate with CATA to increase public transit access and use.	$	
2.3 Establish employer partnerships to incentivize and support sustainable commuting and telework options.	$	
2.4 Improve walking infrastructure.		
2.5 Support projects that increase the safety of multiple modes of transportation.		

3. Align land use and housing with transportation infrastructure to increase ac cess to walking, biking and public transit

Vehicle miles traveled are directly tied to how communities are planned and developed. Communities that are spread out and offer few options for walking, traveling by bike, or access to public transit inevitably require residents to travel greater distances to reach destinations by car, therefore consuming more fuel and increasing emissions. Safe and accessible biking, walking and transit infrastructure should be a priority in all land development to reduce the reliance on cars. A reduction in GHG emissions requires changes to land use patterns that reflect more compact and mixed-use development.

Action	Co-Benefits	Potential Impact
3.1 Increase compact and contiguous development.		
3.2 Prioritize multi-modal development through investment incentives and regulation.		
3.3 Align parking options and infrastructure for bikes and EVs with climate goals.		

4. Improve and build resilience into our transportation systems

Planning for future climate change and investing in our infrastructure today can reduce the risk of damage or destruction and protect community members and their property from severe weather events. It is anticipated that Pennsylvania bridges and other transportation infrastructure will be threatened with water, ice and flood damage, and hotter temperatures that will negatively impact concrete, asphalt, electronics, and other materials used in transportation systems. Local government, our community members, and private property owners will need to work together to reduce the risks that extreme weather events pose to the region's infrastructure.

Action	Co-Benefits	Potential Impact
4.1 Identify transportation programs and projects that reduce surface runoff and protect water resources.		
4.2 Coordinate with stakeholders to improve real-time monitoring of flooding, traffic, and traffic operations.		
4.3 Implement recommendations in the Centre County Long Range Transportation Plan.		
4.4 Advocate for PA to participate in the Transportation and Climate Initiative (TCI) of the Northeast and Mid-Atlantic States.		

Municipal Leadership

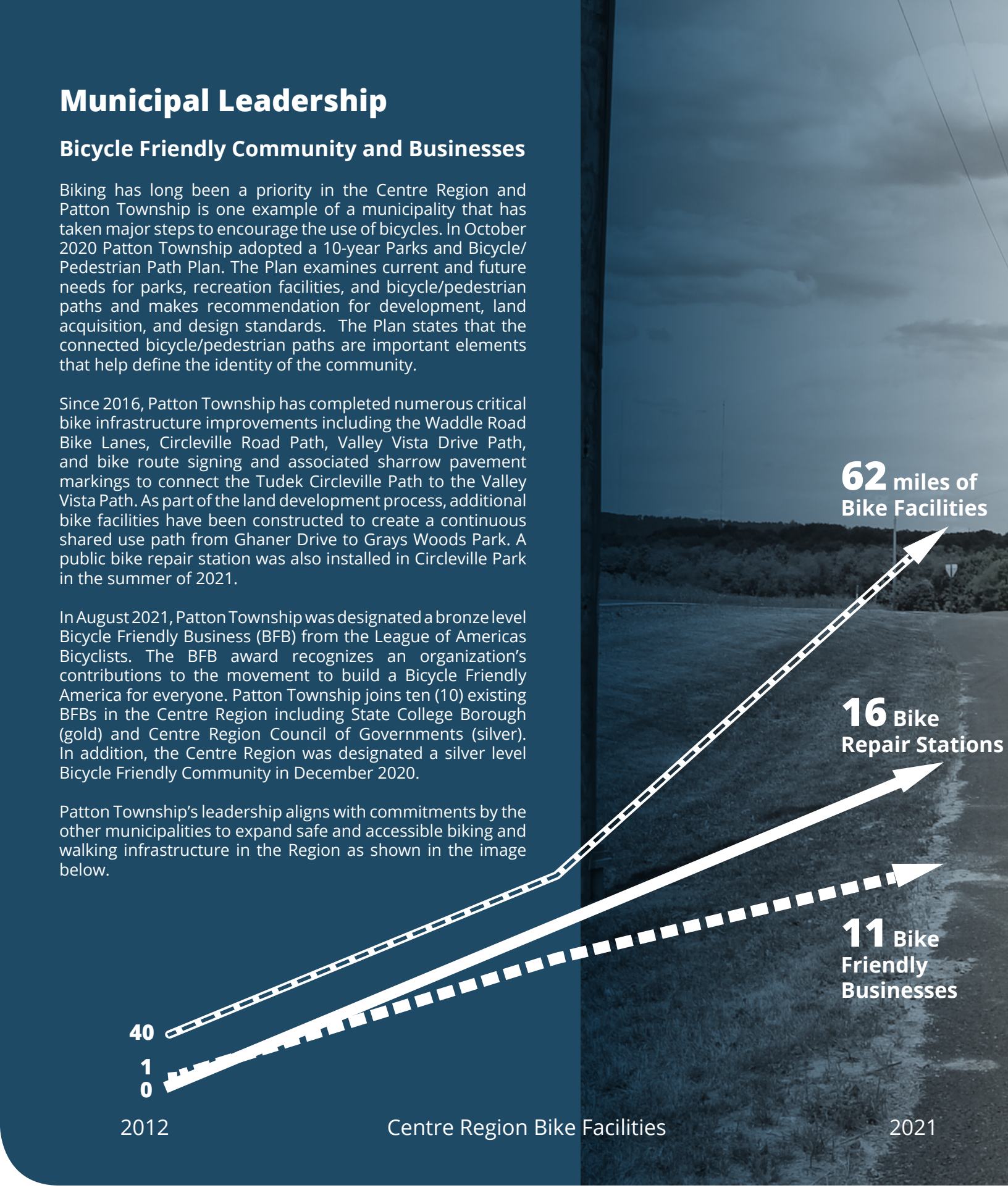
Bicycle Friendly Community and Businesses

Biking has long been a priority in the Centre Region and Patton Township is one example of a municipality that has taken major steps to encourage the use of bicycles. In October 2020 Patton Township adopted a 10-year Parks and Bicycle/ Pedestrian Path Plan. The Plan examines current and future needs for parks, recreation facilities, and bicycle/pedestrian paths and makes recommendation for development, land acquisition, and design standards. The Plan states that the connected bicycle/pedestrian paths are important elements that help define the identity of the community.

Since 2016, Patton Township has completed numerous critical bike infrastructure improvements including the Waddle Road Bike Lanes, Circleville Road Path, Valley Vista Drive Path, and bike route signing and associated sharrow pavement markings to connect the Tudek Circleville Path to the Valley Vista Path. As part of the land development process, additional bike facilities have been constructed to create a continuous shared use path from Ghaner Drive to Grays Woods Park. A public bike repair station was also installed in Circleville Park in the summer of 2021.

In August 2021, Patton Township was designated a bronze level Bicycle Friendly Business (BFB) from the League of Americas Bicyclists. The BFB award recognizes an organization's contributions to the movement to build a Bicycle Friendly America for everyone. Patton Township joins ten (10) existing BFBs in the Centre Region including State College Borough (gold) and Centre Region Council of Governments (silver). In addition, the Centre Region was designated a silver level Bicycle Friendly Community in December 2020.

Patton Township's leadership aligns with commitments by the other municipalities to expand safe and accessible biking and walking infrastructure in the Region as shown in the image below.




POLICE

SOLID WASTE

GOAL: Reduce the amount of waste sent to the landfill by 25%.

6%

Disposal of solid waste contributes 6% of community GHG emissions


Since 1916
Nathan's
JOY
CANADA DRY

GOAL: Reduce the amount of waste sent to the landfill by 25%.

Disposal of waste only accounts for 6% of the community's emissions, yet material consumption and corresponding waste systems have significant environmental and climate impacts that are not included in calculations of the current GHG emissions data. A recommendation for the next inventory is to consider consumption-based emissions, but in the meantime, data does exist on our community's waste tonnages. The average waste disposed in our community is 3.9 pounds per person per day. While this is better than the national average of 4.9 pounds per day, that reflects over 74,000 tons going to the landfill annually.

Centre Region's solid waste is primarily processed through the Centre County Recycling and Refuse Authority (CCRRA). The refuse is transferred to the GFL landfill in Elk County and CCRRA processes and markets the recyclables. State College Borough's Public Works collects and processes organic material from their residents and some business at their compost facility.

CCRRA is currently engaged with multiple stakeholders to develop a Zero Waste Strategy for Centre County. A Zero Waste strategy aligns with the objectives and actions in this chapter and by working together we can efficiently and effectively guide the community to reduce, reuse and recycle.

It is in the Centre Region's long-term interest to reduce waste at its source, expand recycling facilities, reduce food waste, and enable re-use of materials. Additional benefits of actions in this section include reduced environmental and social impacts of waste disposal, improved air and water quality, improved public health, cost-savings, and potential job growth in related sectors.

Processing of Centre Region Waste Stream - 10 Year Average

The waste stream is the complete flow of waste from its domestic or industrial source through to recovery, recycling, or final disposal. In the Centre Region, this includes all residential, business, institutional, and industrial waste apart from some construction and demolition waste. In the Centre Region, 8% of the waste stream is recycled, meaning it is collected, sorted, and marketed to be processed into manufacturing stock. Another 10% of the waste stream is composted; this includes food and yard waste collected by the municipalities. That means that 82% of the waste stream is still being landfilled. In the Centre Region, about 14,000 tons of landfilled waste come from single-family households. The bulk of the waste sent to the landfill, about 66% of the waste stream at 60,000 tons annually, is produced by the commercial sector. The commercial sector includes all businesses, institutions, residential buildings with dumpster service and most construction and demolition waste.

Almost 74,000 Tons Landfilled Annually

Recycled Materials (8%)

Diverted Organics (10%)

Landfilled Residential Waste (16%)

Landfilled Commercial Waste (66%)

Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate reduce, reuse, and recycling programs through education, partnerships, and policy.

Potential Indicators

- **Waste diverted from landfill to recycling and composting.**
- **Consumption-related emissions.**
- **Number of community gardens and farmers markets.**

Co-Benefits

$ Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Encourage reducing waste at the source in municipal operations, homes, and businesses

While there are several options available for reducing the amount of waste reaching the landfill, reducing waste at the source by purchasing and consuming less material will always be the most effective recourse for dealing with waste. By focusing first on source reduction, families and businesses can save significant money, while lifting some of the burden off waste management services and learning to create value from materials that would otherwise end up being discarded.

Action	Co-Benefits	Potential Impact
1.1 Implement an education campaign for waste reduction strategies		
1.2 Develop guidelines, education and resources to shape the procurement policies of the municipal and commercial sectors		
1.3 Incentivize businesses to pursue strategies that minimize their waste		
1.4 Develop systems and infrastructure that promote and institutionalize reusable goods		

Objectives & Actions *continued*

2. Increase diversion in municipal operations, homes and businesses

Diverting more waste away from the landfill is another strategy the Centre Region can focus on to reduce the environmental impacts of the community's consumption. Municipalities should lead by example to demonstrate the benefits of being a low waste generator. A coordinated approach of consistent messaging and education can guide businesses and community members to become low waste generators. A focus will be on improving business's recycling opportunities since 81% of the waste landfilled in our region comes from the commercial sector.

Action	Co-Benefits	Potential Impact
2.1 Municipal government and governmental entities lead in becoming low waste generators		
2.2 Develop programs and policy to increase recycling at commercial locations and multi-family properties		
2.3 Increase recycling during construction and demolition projects		
2.4 Reduce organics going to the landfill		

3. Improve efficiencies of waste management

Improving the efficiency of the waste flow is an opportunity for emissions reduction, but it can also lead to other benefits such as lower costs, cleaner air and less noise pollution. Route efficiency, reduction of waste transportation miles and vehicle efficiency should continue to be improved to reduce emissions. Many of the refuse and recycling trucks in the region now run on clean natural gas (CNG) fuel, but as technologies become available this sector should continue to make low carbon fuels a priority.

Action	Co-Benefits	Potential Impact
3.1 Support refuse and recycling trucks continue to increase fuel efficiency and reduce their carbon fuel sources.		
3.2 Identify intersectional opportunities between solid waste, food production and energy.		
3.3 Strive towards bi-weekly garbage collection		

4. Support locally produced products

Supporting environmentally responsible production of goods and food locally—in or around Centre County—is beneficial because it eliminates the emissions associated with shipping goods to the region and gives the community greater influence over sustainable production practices. Supporting local products also improves the community's resilience and supports the local economy.

Action	Co-Benefits	Potential Impact
4.1 Partner with nonprofit organizations to promote purchase of local food and products		
4.2 Expand community gardens and access to healthy, local food		
4.3 Consider policies to encourage institutional purchasing of local and climate-friendly foods throughout the Region		
4.4 Encourage development of food and organic industries relocating to the Region to expand opportunities for increased energy production (biogas)		

Municipal Leadership

Residential Organics Program

Over the past 25 years, State College Borough has expanded its green waste program, which has subsequentially reduced landfill waste and carbon emissions. In 1991, the Borough expanded its curbside leaf collection program and began composting both residential grass clippings and leaves. Borough residents can dispose of their grass clippings in their organics carts but are encouraged to participate in "grass-cycling". In 2010, the Borough piloted a food waste recycling program in the Greentree and Tusseyview neighborhoods. The program was successful. In 2013, the Borough expanded this program to the entire municipality. Borough residents can dispose of food and compostable waste in their organics cart, which is collected on the same day as their trash. The Borough's residential curbside organics program is a leader across our region and throughout the Northeast.

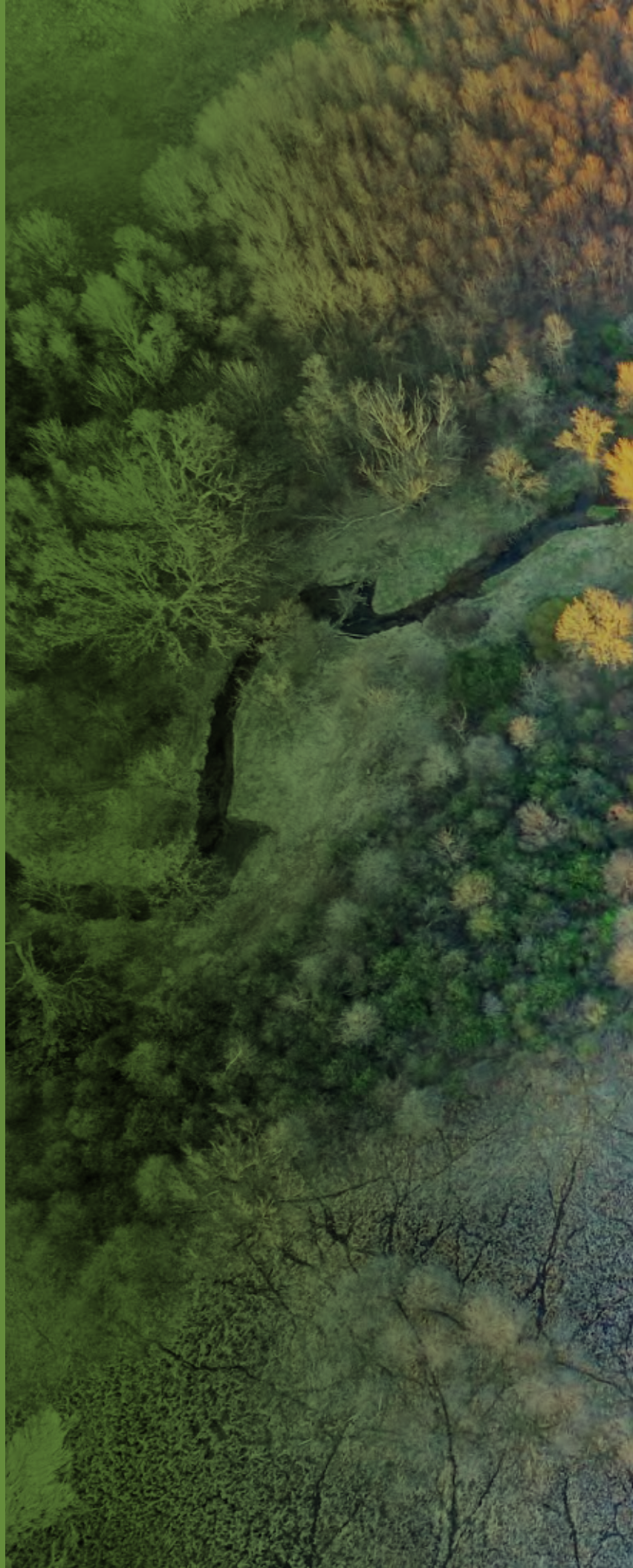
College, Ferguson, Harris, and Patton Townships offer curbside collection of leaf and brush for their residents, which helps keep organic material out of the landfill. It is recognized that our community members are interested in a larger regional organics program. The Sustainability Survey completed in the spring of 2021 showed expanding and initiating an organics program as the top strategy supported by our residents. Options are being explored to help create an organics program recognizing the disparity between State College Borough's dense coverage area (96 route miles) to a larger rural-suburban coverage area (2,300 miles route in the COG service area).

LAND MANAGEMENT

GOAL: Preserve, restore, and responsibly manage the Region's diverse and fragile environmental resources.

5%

Land Management contributes 5% of community GHG emissions



GOAL: Preserve, restore, and responsibly manage the Region's diverse and fragile environmental resources.

The Centre Region's population is growing and with a larger population comes new development. The Region's infrastructure, design and neighborhoods are driven by public investments and land use decisions. Choices made today will last for generations. Sustainable land management practices can protect long term infrastructure and natural resources, while strengthening the community through a more accessible, connected, and resilient region.

The Centre Region municipalities utilize a Regional Growth Boundary (RGB) to direct where most of the future growth and development should occur. In addition, the Region has a series of long-range planning documents that guide development across the Region's districts, neighborhoods, and natural areas. Revisiting the RGB and plans to ensure that they support climate-ready development needs, such as walking, biking, transit, parking management, and climate adaptation features, will ensure that the Region's development is consistent with the CAAP climate goals and commitments. It will be important to ensure that these activities do not come at the expense of higher housing costs, which could disadvantage low-income populations.

The way the Region manages and utilizes its land has an impact on our use of water, transportation, energy and waste. It is imperative to understand these relationships as the Region continues to grow to remain a resilient community.

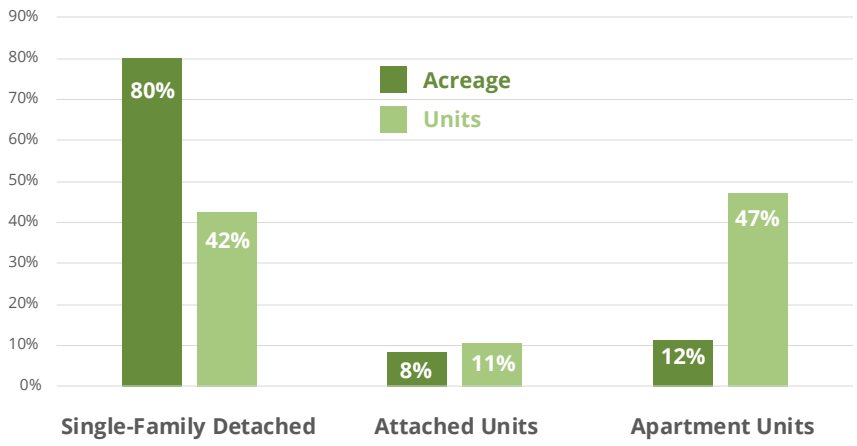
This section focuses on programs and policies that not only reduce emissions associated with land use and management practices but also those that bolster the Region's resilience and reduce the risks associated with an increased frequency of climate-related extreme weather events.

Centre Region Land Consumption Study

In 2020, the Centre Regional Planning Agency (CRPA) prepared the Centre Region Land Consumption Study which evaluates how residential lands within the Regional Growth Boundary (RGB) have been developed over time. The study showed that single-family detached dwellings consume an average of 0.37 acre per unit, while attached units consume 0.15 and apartment units consume 0.05.

Sustainable and efficient development of the remaining vacant parcels is crucial to ensuring that the current boundary will be able to meet the needs of the Region over the long term. The recommendations in the report should be explored to help extend the development capacity of vacant lands within the boundary.

Percentage of Acres & Units Comparison - Centre Region



Single-family detached dwellings consume the greatest amount of residential land area (80%) within the RGB. Single-family detached dwellings make up 42% of the total residential units.

Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate sustainable land management practices through education, partnerships, and policy.

Potential Indicators

- **Acres of developed land**
- **Acres of conserved land**

Co-Benefits

$ Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Educate, encourage, and promote sustainable agricultural, forest and land management practices

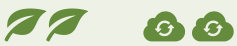
Properly managed agriculture land and forests can be part of the climate solution by absorbing atmospheric carbon dioxide. Our community has long recognized the importance of preserving land and we are fortunate that 49% of our land is forested and 26% is farmland. Preserving this land will remain a priority. In addition, we will identify revegetation methods and plant materials for restoration of large public areas, including rights-of-way, parks, and utility easements. Additionally, we will promote the use of native grass and plant species for turf re-establishment in residential and commercial areas.

Action	Co-Benefits	Potential Impact
1.1 Develop a regional policy strengthening the preservation of agricultural and forested properties.		
1.2 Review and update ordinances to allow for and promote native plantings and no-mow/low-mow areas.		
1.3 With community partners provide education programs to empower homeowners, landscapers and businesses (nurseries) to follow sustainable landscaping best practices.	$	

Objectives & Actions *continued*

2. Promote and support rebuilding soil and sustainable practices that sequester carbon

Farmers manage nearly a quarter of Pennsylvania's land, and farmers and farmland can play a big part in our transition towards a climate-ready community. In addition to driving down the emissions that are part of their own operations (mainly from fertilizers, manures, and tractor fuel), farmers can help us offset urban emissions by sequestering carbon in the soil through soil-building practices. And because well-managed farmland does a great job of absorbing and regulating stormwater, farmland preservation can help us protect our roads, infrastructure, and water supplies from the more intense storms that climate change will bring.

Action	Co-Benefits	Potential Impact
2.1 Support local agricultural entities to develop and implement education and outreach programs about carbon farming practices that will enhance carbon sequestration, increase soil health, climate resilience, and crop productivity.		
2.2 Engage technical assistance and support through Cooperative Extension, NGOs, state and local government, federal agencies and other programs.		
2.3 Advocate for sustainable funding mechanisms to support best management practices		

3. Reduce reliance on carbon heavy fuel sources

Local government can take the lead on developing public landscapes and park spaces that are more resilient and sustainable. This will also include switching to electrically sourced landscaping equipment as replacements are purchased. Through our experiences we can share the best practices and benefits of sustainable landscaping practices to build community knowledge and increase resilient properties throughout the Region.

Action	Co-Benefits	Potential Impact
3.1 Local governmental entities adopt a sustainable landscaping standard - reduce water and chemical consumption and transition to electrically sourced landscaping equipment.		
3.2 Promote and educate businesses and residents about benefits of electric landscaping equipment.		

4. Support land managers becoming more resilient

Besides contributing to greenhouse gas emissions through more urban development, non-climate conscious land management practices can increase the Centre Region's risk from severe weather events exacerbated and made more frequent by a changing climate. Across our region, many land managers are already adapting to rapidly changing weather patterns that include more intense rainstorms, intermittent droughts, and heat waves. Collaboration, education and policy will play a big part in our transition towards a climate-ready community.

Action	Co-Benefits	Potential Impact
4.1 Evaluate including low-impact development standards in zoning ordinances		
4.2 Analyze farmland and parkland to identify disadvantaged cropland / land that could be more productive for other uses: perennial cropping, solar installations, riparian buffers, etc.		
4.3 Create policies that guide regional development and planning considering the Region's climate vulnerabilities		

Municipal Leadership

Sustainable Land Management Practices

Ferguson Township has put sustainable land management ideals into practice with the completion of its new Public Works building which has been built to meet Leadership in Energy and Environmental Design (LEED) Gold standards. The stormwater management for their entire property was re-analyzed with the new building construction and incorporates many best management practices (BMPs). The BMPs include bioswales, rain gardens, pervious pavement, storm basin recharge, capture, and volume control, hydrodynamic separator, sink hole protection, and separate containment for the fueling area.

The new Public Works building will also have a smaller energy footprint. The building's heating and cooling system incorporates a variable refrigerant flow system, energy recovery units on the rooftop, and in-slab hot water heating. A rooftop solar array is under construction to offset the electric and gas demands for the building with a goal of net zero energy.

The building demonstrates a commitment to steward financial responsibilities over the long term by helping to reduce energy demand, managing stormwater, and providing a safe environment. The building, through its design and use, should perform in such a way that it makes the people who work there healthier, and sets the stage for a healthier community.


FERGUSON TOWNSHIP

CLEAN HEALTHY WATER

GOAL: Conserve, protect, enhance, and restore our water resources.

2%

Water / Waste Water contributes 2% of community GHG emissions

GOAL: Conserve, protect, enhance, and restore our water resources.

Land and water are inextricably linked, so this section builds upon the previous subsection on Land Management. Many of the Centre Region's natural systems and surrounding natural areas increase our resilience by the ecosystem services they provide such as water filtration, flood abatement, pollination, recreation, and fire protection. Restoring and protecting our natural systems and areas are necessary as increasing impervious surfaces in urbanized areas intensify stormwater runoff and the urban heat island effect—making us less resilient in the face of extreme weather and climate change.

Importantly, the effects of climate change on natural systems are interrelated and may compound each other; for example, if Central Pennsylvania experiences a significant drought in the future, it will increase the risk of wildfires. Changes in temperature, snowpack, and the growth of diseases and pests will stress sensitive streams, plants, wildlife, and ecosystems.

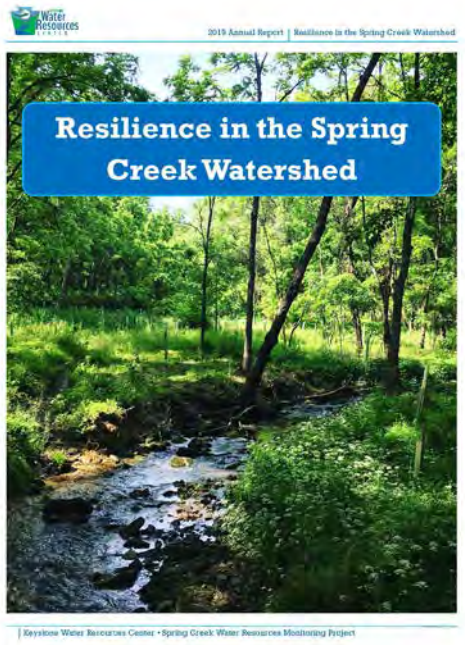
Spring Creek attracts many visitors to the Centre Region. In addition to the tourism and fishing opportunities, the Region's potable water is supplied through the Spring Creek Aquifer. This aquifer contains approximately 200 billion gallons of water and encompasses 150 square miles. In addition to the Spring Creek Watershed, the Centre Region contains land in parts of the Halfmoon Creek and Spruce Creek Watersheds. As responsible stewards for our region we need to continue to restore, protect, and conserve our water supply.

Solutions for our land and water resources must account for the full extent of our watersheds and will require new and inclusive strategic partnerships supported by thoughtful, ongoing coordination to achieve maximum impact. Failure to coordinate our actions will undermine our efforts and waste time, money, and precious environmental resources.

Resilience in Spring Creek Watershed Report

Keystone Water Resources Center (KWRC) is a non-profit organization that conducts water resource monitoring in Central PA and uses that data to provide public education on surface and groundwater resources, with a focus on the Spring Creek Watershed. Their 2019 Annual Report Resilience in the Spring Creek Watershed provides an overview of significant threats to the watershed - land development and climate change - as well as best management practices used within the Spring Creek Watershed to improve its resiliency.

The CAAP aligns with the objectives of this organization by identifying actions that maintain and restore clean healthy waters through restoration projects and best management practices that reduce stormwater runoff. Continued collaboration with our many community organizations, such as KWRC, will improve our watersheds' resiliency



Report link: https://bit.ly/3lxTZdM

Objectives & Actions

The objectives and actions described below will support, enhance, and accelerate sustainable land management practices through education, partnerships, and policy.

Potential Indicators

- **Acres of forest maintained**
- **Stream water quality - abiotic and biotic indices**
- **Water supply and consumption**

Co-Benefits

Economic Prosperity, Equity, Resource Security, Health and Environment

Potential Impacts

Decrease Emissions and Improve Resiliency

1. Manage flooding and reduce erosion impacts on infrastructure

Through the Sustainability Survey the community showed the most support for identifying and protecting high priority conservation lands to manage flooding. The next highest was for using green infrastructure such as rain gardens and permeable pavement to better manage impacts of stormwater. In partnership with regional organizations and private landowners, we will promote the preservation and restoration of lands critical to making our community more resilient to extreme weather conditions. Understanding that extreme rain events will be increasing, it is also critical to help our community members be prepared, respond and quickly recover.

Action	Co-Benefits	Potential Impact
1.1 Identify and protect high priority conservation lands to manage flooding and protect groundwater recharge zones.		
1.2 Use green infrastructure to better manage impacts of stormwater.		
1.3 Incentivize implementation of green infrastructure on private property.		
1.4 Identify road access issues related to flooding – electrical distribution / energy systems, emergency management.		
1.5 Identify vulnerable populations and strengthen communications outreach.		

Objectives & Actions *continued*

2. Grow and maintain a healthy tree canopy (urban, suburban, rural, forest)

A healthy tree canopy provides many benefits beyond carbon sequestration -capturing and storing atmospheric carbon. Trees and plants remove pollution from the air and reduce run-off. Open spaces and stream corridors define a sense of space in our communities while providing a quiet respite from hectic urban life. Trees help save energy, reduce noise, and soften the hard edges of structures and paved areas. It is important to identify and plant multiple tree species well selected to thrive in future conditions.

Action	Co-Benefits	Potential Impact
2.1 Develop a Centre Region tree strategy for public properties and the community.		
2.2 Update / develop a municipal street tree guide and landscape design standards for new development for tree species appropriate for a future local climate.	$	
2. 3 Update and/or consider a tree preservation ordinance.		

3. Increase the Region's resiliency by restoring, protecting, and conserving community water resources

Our local waters are under constant attack from pollution. Increased urbanization and agricultural practices within the Region have caused pollution in many forms. The biggest threats to our water supplies are temperature pollution and nutrient loading caused by stormwater runoff and agricultural practices within the Region. The Centre Region needs to apply best management practices to protect its water resources. Land use, stormwater management, and wastewater collection and conveyance need to be constantly addressed since all three are evolving in different ways.

Action	Co-Benefits	Potential Impact
3.1 Identify opportunities for rainwater collection systems, riparian buffers and water reuse at existing and new public facilities and properties.		
3.2 Evaluate incentives for practices that reduce use of potable water for non-potable purposes and/or recharge groundwater.		
3.3 Expand water conservation outreach and incentive programs for residents and businesses.		

4. Restore and protect ecosystems and promote ecosystem resilience

Healthy natural ecosystems play a significant role in infiltrating stormwater, improving air quality, keeping temperatures cooler on hot days, sustaining healthy food systems, and contributing to the overall resilience of the Centre Region. Collaboration with community partners will guide local government to create policies that can play a key role in protecting ecosystem elements from climate related threats.

Action	Co-Benefits	Potential Impact
4.1 Support partners in identifying, restoring and protecting critical habitats.		
4.2 Develop a pest management strategy, including education (applies to trees, public health and agriculture)		
4.3 Promote native species plantings and preserve park spaces.		

Community Leadership

Creative Conservation Partnerships

Farms can be managed in a way that creates multiple benefits beyond production. For example, the 2017 Slab Cabin Run Initiative included a collaboration between Clearwater Conservancy, the Meyer and Everhart Family farms, and local governments to permanently protect the Region's source water and restore its natural resources.

The Slab Cabin Run Initiative began with a $2.75 million fundraising effort to permanently conserve 300 acres of farmland and a section of stream located in a source water protection area for the Harter-Thomas Wellfields, which provide the majority of drinking water to Centre Region residents. The initiative also included the installation and ongoing maintenance of a multi-acre riparian buffer that serves multiple ecological functions, including improved habitat, shade for the stream, and carbon sequestration.

Efforts related to the Slab Cabin Initiative continue today, and in 2021, yet another phase of restoration work took place along 3,200 linear feet of Slab Cabin Run through a partnership between Centre Hills Country Club, Trout Unlimited, and ClearWater Conservancy.

"Restoration of Slab Cabin Run has long been a priority for our community and partnerships make it possible to continually improve our region's water quality," said Deb Nardone, executive director of ClearWater Conservancy.


2.75M
2.5M
2.1M
PROTECT
OUR WATER
PRESERVE
THE FARM
DONATE
ARWATERC SERVANCY.ORG

IMPLEMENTATION

The completion of the Centre Region Climate Action and Adaption Plan (CAAP) does not mark an endpoint but rather the beginning of a long-term effort. The CAAP provides a roadmap for a more sustainable and resilient future.

This plan won't be successful without the participation and leadership of the entire community. Collaboration will be needed between local governmental entities, businesses, community organizations, utility service providers, schools, and residents to ensure these goals are achieved.

The Centre Region municipalities will continue to lead by example, while serving as a catalyst for broader community action. Building a sustainable and resilient community requires significant structural shifts in governance, business leadership, and community stewardship to support whole systems approaches. Working across sectors, organizations, and departments will be essential to find the best solutions that create social equity, economic prosperity, and enhanced quality of life.

Next Steps

The Climate Action and Sustainability (CAS) Committee recognizes that in order to achieve goals within the Climate Action and Adaptation Plan (CAAP) there must be robust implementation, external accountability, and strong partnerships. CRCOG will play a central role in coordinating partnerships, leading overall implementation and providing necessary information to continue to align goals with external stakeholders such as relevant Boards, Committees, Commissions, and local stakeholder organizations.

Given that this is the Region's first climate action plan, and to encourage all-encompassing participation, CRCOG envisions a phased approach for implementation.

Initial Action:

- **The Centre Region municipalities will lead by example to spur comprehensive community action.**
- **Early implementation efforts will also emphasize educational programs and incentives to inspire action, build community support, develop public-private sector partnerships, and enhance community readiness.**
- **Local government and the community will define priority actions that will drive the creation of specific plans of action and resource needs among the responsible parties.**

These initial actions can build the broader ownership that is essential to create momentum, guide decision making, and lay the groundwork for more transformational actions needed in the future. The plan proposes best estimates based on our current knowledge and further study will be needed as we delve into the implementation phase of some actions. Climate action planning is a continuous cycle and does not stop with the development of this document. As details are developed during the implementation phase, more specific quantitative goals and milestones will be created, driving the pace of implementation.

Despite an initial attempt to create extensive representation of the community, CRCOG recognizes that certain groups have not been included in the planning stages. Throughout implementation CRCOG will continue to engage and broaden its audience to improve the understanding of and alignment with the CAAP. CRCOG will also look to collaborate and provide ways for interested community members to become involved with the CAAP implementation phase.

Monitoring & Accountability

Establishing a monitoring process will be necessary to enable CRCOG to track the impacts of the actions included in the plan and compare estimated impacts to what is achieved in terms of energy savings, renewable energy production, GHG emissions reduction and community resiliency. Monitoring progress will assist in the determination of whether an 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 Climate Action and Sustainability (CAS) Committee has responsibility for providing oversight of how to measure, monitor, and assess reductions in greenhouse gas emissions and to meet climate goals over time. The committee will be tasked with considering the best practices for monitoring and reporting progress. **The graphic on the next page outlines the initial reports that can be expected to demonstrate progress on the CAAP actions**. Providing progress updates to the community will lead to greater understanding and help build broader community support.

Progress Update Schedule

2022	**GHG Emissions Inventory**	**Compile community-wide emissions data using 2021 data**
2024	**Progress Report**	**Every two years provide status on the overall impact and updates on key actions taken.**

The CAS Committee will also need to define a process for prioritizing actions and updating the CAAP. They could consider integrating the CAAP into the Comprehensive Plan Implementation Program (CHIP). The CHIP translates the goals, objectives, and policies in the Comprehensive Plan into actionable projects and identifies priorities, timeframes, and primary responsibilities to complete the projects.

Funding

The objectives and actions contained in the CAAP will require funding over the entire course of implementation. This will create another competing demand on limited municipal budgets. CRCOG and the municipalities will need to employ long-term and creative approaches to secure funding sources and take advantage of grant opportunities, evolving renewable markets, and emerging technological opportunities to successfully implement reductions in greenhouse gas emissions and climate adaptation actions.

To support residents, businesses, and community-based organizations in the implementation of actions included in this plan, CRCOG will need to document funding gaps and existing financial incentives, identify a variety of potential funding partners, and investigate best practices used in other communities. Proven mechanisms and tools that work in other communities include revolving loan funds, public-private partnerships, and working with utilities to access incentives and develop programs best suited to help utility customers use energy more efficiently.

The CAAP is a comprehensive roadmap to accelerate our continued success in building a more healthy, equitable, resilient, and sustainable community. It is also a call to action to governmental entities, businesses, community organizations, and residents to take an active part in the implementation of the plan to support our community transition to a low carbon future, prepare for the impacts of climate change, and create a healthier and more prosperous community.

Community Leadership

Penn State Reduces Greenhouse Gas Emissions

In 2005, Penn State set its first greenhouse gas emissions reduction goal of 17.5% by 2012. After meeting this goal, a reduction target of 35% was set for 2020. Last year, the University surpassed that goal and now begins setting its sights on an aggressive 85% reduction of greenhouse gas emissions by 2050. A couple of the programs that have aided in meeting these targets are outlined below.

Energy Savings Program

Author: Laura Miller, Energy Program Manager, Office of Physical Plant, Penn State

For nearly 20 years, Penn State has invested in campus-wide energy conservation measures via its Energy Savings Program, which annually funds building energy conservation projects and utility system efficiency improvements. Projects range from tuning up existing buildings in order to optimize their performance, building HVAC system upgrades, updating of temperature controls, lighting fixture retrofits, installation of occupancy sensors, envelope improvements, and much more. Penn State awards performance contracts to pre-approved firms for large energy projects (e.g. bundling multiple conservation measures) at any of the University's locations or contributes funds that ensure energy efficiency in projects where energy is not necessarily the primary focus. In either case, the energy funds, including financing, are recovered through the avoided utility costs over a maximum 10-year payback period.

Continuous Commissioning (CCx)

Author: John Deffenbaugh, Senior Continuous Commissioning Engineer, Office of Physical Plant, Penn State

Commissioning occurs shortly after the completed construction of a new building to verify it is functioning according to its design objectives. Implemented in 1998, the University Park Continuous Commissioning Program (CCx) not only focuses on newly constructed buildings, but also on re-commissioning, retro-commissioning, and maintenance of existing campus buildings. The goals of the program are to reduce energy costs and greenhouse gas (GHG) emissions, improve indoor thermal comfort, and reduce maintenance costs while optimizing building performance for its users. CCx projects are corrective and typically have a 5-year simple payback.


PSECU

APPENDIX


SOLAR UNITED NEIGHBORS
GO SOLAR


MARCH NOW OR SWIM LATER

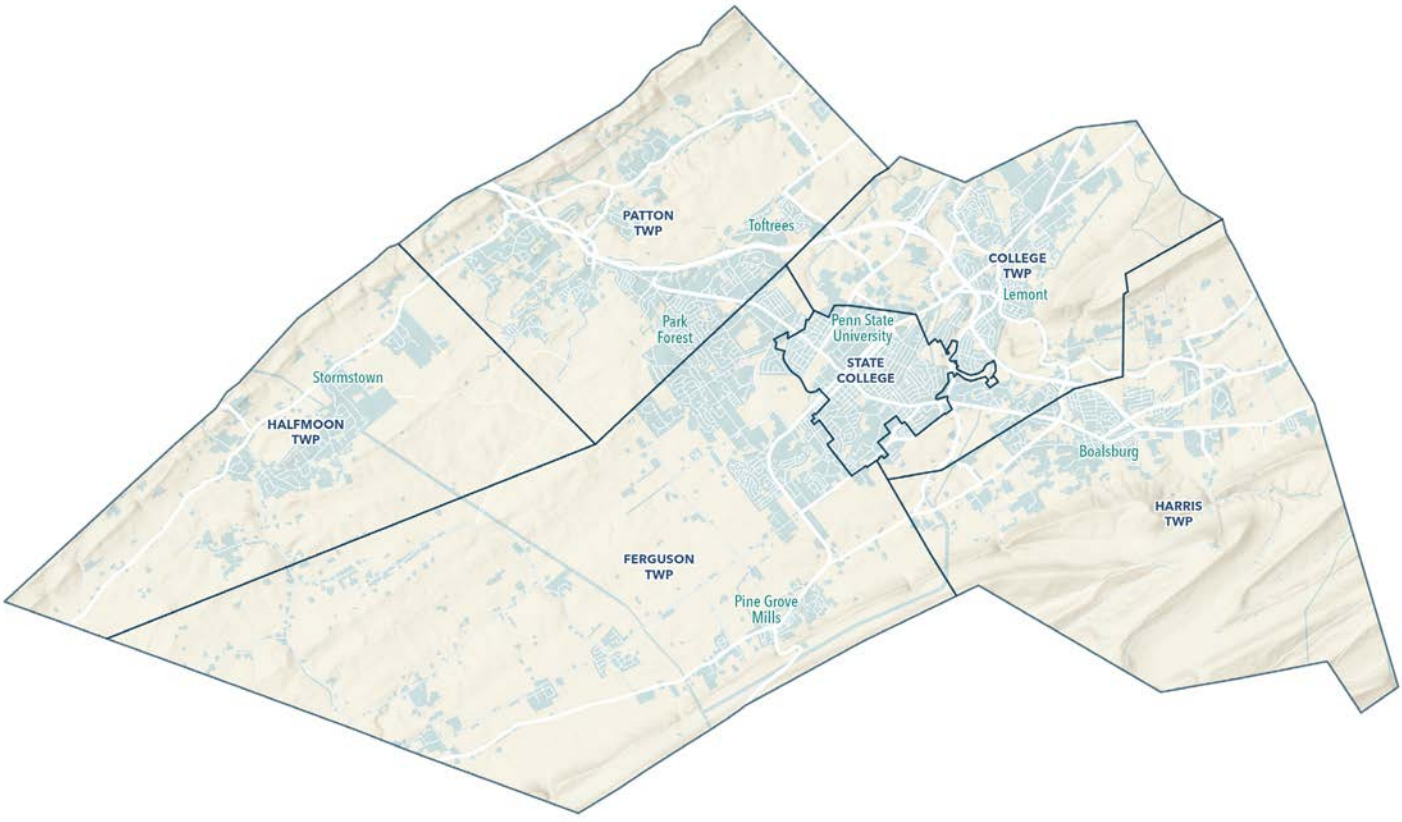

BIKE LANE

CRCOG Factsheet

The Centre Region Council of Governments (CRCOG) is a voluntary association of State College Borough, and College, Ferguson, Halfmoon, Harris, and Patton Townships. It was established in 1969 to provide cost effective and high-quality public services to area municipalities within the Centre Region. The services that CRCOG provides include: building code administration, emergency management, fire protection, library, local-regional planning, parks and recreation, and refuse-recycling collection.

The Centre Region COG is governed by the General Forum, which is comprised of 32 elected officials from the six municipalities. Eight standing committees exist within CRCOG to prepare recommendations that address a variety of regional issues, programs, and services. Each municipality appoints one elected official to each of the COG Committees – Executive, Finance, Human Resources, Parks Capital, Public Safety, Climate Action and Adaptation, Facilities, and joint Public Services & Environmental and Transportation & Land Use.

	College TWP	Ferguson TWP	Halfmoon TWP	Harris TWP	Patton TWP	State College Borough	Centre Region
Total Population	10,147	19,118	2,755	5,612	15,905	42,256	95,968
Housing Units	3,974	8,083	985	2,560	7,198	14,099	37,019
Square Miles	19	48	24	31	25	5	152




Sustainability
Local government working on stewardship and climate planning
Stay Informed. Get Involved.

Links to Additional Information

Climate Action and Technical Advisory Group: https://www.crcog.net/tag

Agendas, meeting summaries, meeting recording, an overview and information on the five *Climate Actions for our Community Sessions.*

GHG Emissions Inventory Report: https://www.crcog.net/ghginventory

Full report, executive summary and information graphic of community-wide greenhouse gas emissions inventory.

Resolution 2020 – 1: https://www.crcog.net/climate-goals

Resolution adopted on July 27, 2020 by the General Forum identifying climate goals for the Centre Region.

Sustainability Survey: https://www.crcog.net/sustain-survey

Full report and executive summary of the Centre Region Sustainability Survey that was conducted March – April 2021.

***Addressing Climate Impacts in the Centre Region* Public Forum:** https://www.crcog.net/climate-forum

Full report and executive summary of the community forum attended by over 150 people on April 13, 2021.

Centre County Hazard Mitigation Plan 2021 Update: https://www.pennsylvaniahmp.com/centre-hmp

Website hosting the 2021 Hazard Mitigation Plan Update and the other appendices.

Ferguson Township Resiliency Building Workshop: https://www.twp.ferguson.pa.us/home/news/findings-community-resilience-building-workshop

Overview and full report of workshop attended by 25 stakeholders held on April 28, 2021.


THERE IS NO PLANET B
DON'T be a FOSSIL FOOL
STRIKE for CLIMATE!
You KNOW ITS TIME FOR CHANGE WHEN CHILDREN ACT LIKE LEADERS AND LEADERS ACT LIKE CHILDREN!
PLANET OVER PROFIT
the OCEANS are RISING and so are WE

Acronyms

AICP	American Institute of Certified Planners
BFB	Bicycle Friendly Business
BFC	Bicycle Friendly Community
BMP	Best Management Practices
CAAP	Climate Action and Adaptation Plan
CAS	Climate Action and Sustainability (Committee)
CATA	Centre Area Transportation Authority
CCRRA	Centre Region Recycling & Refuse Authority
CCx	Continuous Commissioning
CHIP	Comprehensive Plan Implementation Program
CNG	Compressed Natural Gas
CO2e	Carbon dioxide equivalent
C-PACE	Commercial - Property Assessed Clean Energy
CRB	Community Resilience Building
CRCOG	Centre Region Council of Governments
CRPA	Centre Regional Planning Agency
CTWA	College Township Water Authority
DEP	Department of Environmental Protection
EVs	Electric Vehicles
GFL	Green for Life
GHG	Greenhouse Gas
HMP	Hazard Mitigation Plan
HVAC	Heating, Ventilation, and Air Conditioning
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
LCAP	Local Climate Action Program
LEED	Leadership in Energy and Environmental Design
LLC	Limited Liability Company
LLP	Limited Liability Partners
MACRS	Modified Accelerated Cost Recovery System
MTCO2e	metric tons of carbon dioxide equivalent
NOAA	National Oceanic and Atmospheric Administration
PA	Pennsylvania
PennDOT	Pennsylvania Department of Transportation
PSE	Public Services and Environmental (Committee)
PSU	Penn State University
RCP	Representative Concentration Pathway
RGB	Regional Growth Boundary
SCASD	State College Area School District
SCB	State College Borough
SCBWA	State College Borough Water Authority
SPPA	Solar Power Purchase Agreement
SPPA WG	Solar Power Purchase Agreement Working Group
TAG	Climate Action and Adaptation Technical Advisory Group
TCI	Transportation Climate Initiative
U.S.	United States
UAJA	University Area Joint Authority
USA	United States of America
USDA	United States Department of Agriculture

Climate Actions for our Community Sessions

Purpose

Collaborate with technical advisors to gather the best available science, technology and knowledge to identify a menu of action items that could be incorporated into the climate action and adaptation plan.

- Energy Focus: May 18, 2020
- Transportation Focus: July 8, 2020
- Solid Waste Focus: August 12, 2020
- Agriculture-Land Management Focus: September 2, 2020
- Water Focus: December 16, 2020

Subject Matter Experts

Jim Baird, *Water Utility Systems Engineer, PSU*
Trevor Birkenholtz, *Director of Riparia, PSU*
Kristy Borelli, *Educator-Agronomy, Penn State Extension*
Rob Brooks, *Professor Emeritus of Geography and Ecology, PSU*
Tony Buda, *Hydrologist, USDA*
Colton Brown, *Energy Program Specialist, PA DEP*
Andrew Cole, *Professor of Landscape Architecture, PSU*
Mimi Cooper, *Assistant Recycling Coordinator, CCRRA*
Dorn Cox, *Research Director, Wolfe's Neck Center for Agriculture & the Environmental*
David Cullmer, *Sustainability Operations Analyst, Sustainability Institute, PSU*
Alex Danovitch, *Zero Waste Collaborator, Nothing Left to Waste*
Steve Deasy, *President, Sustainable Resources Consulting*
Jason Detar, *Fisheries Manager, PA Fish & Boat Commission*
Eric Donnell, *Director Larson Transportation Institute, PSU*
Jon Duncan, *Assistant Professor of Hydrology, PSU*
Jon Eich, *SCB Planning Commission*
Larry Fennessey, *Stormwater Utility Systems Engineer, PSU*
Lara Fowler, *Law Professor, PSU*
Caitlin Glagola, *Central PA Watershed Coordinator, Chesapeake Bay Foundation*
Diana Griffith, *Senior Planner / Agricultural Land Preservation Coordinator, Centre County*
Jason Grottini, *Vice President, Envinity*
Joe Guley, *Project Manager, Stahl Sheaffer Engineering LLC*
Ed Hicks, *Commercial Recycling Coordinator, CCRRA*
Mitch Hunter, *Research Director, American Farmland Trust*
Larry Hutchinson, *Trustee, Centre County Farmland Trust*
Lisa Iulo, *Associate Professor of Architecture, PSU*
Ed Johnstonbaugh, *Educator- Energy Savings and Renewables, Penn State Extension*
Paul Jovanis, *Vice-Chair, SCB Transportation Commission*

Derek Kalp, *Landscape Architect, PSU*
Sarah Klinetob Lowe, *High-Performance Housing Specialist, PA Housing Research Center*
Bruce Logan, *Associate Director of Institutes of Energy and the Environment, PSU*
Shelly McKeague, *Compliance Manager, PSU*
Lauren McPhillips, *Assistant Professor of Civil & Environmental Engineering, PSU*
Jamie Mierau, *Mid-Atlantic Regional Director, American Farmland*
Hugh Mose, *Chair, SCB Transportation Commission*
Deb Nardone, *Executive Director, ClearWater Conservancy*
Ngani Ndimdie, *Executive Policy Specialist, PennDOT*
Louwana Olivia, *Executive Director, CATA*
Lexie Orr, *Water Resources Specialist, Keystone Water Resources Center*
Tim Preece, *Senior Transportation Planner, Whitman, Requardt and Associates, LLP*
Tom Richard, *Director of Institutes of Energy and the Environment, PSU*
Joanne Shafer, *Deputy Executive Director/Recycling Coordinator*
Erica Smithwick, *Associate Director of Institutes of Energy and the Environment, PSU*
Haley Stauffer, *Graduate Student, PSU*
Susan Stewart, *Associate Professor of Aerospace Engineering, PSU*
Ford Stryker, *Vice President, Trout Unlimited*
Neil Sullivan, *University Planner, PSU*
Elizabeth Traut, *Assistant Research Professor, Larson Transportation Institute, PSU*
Lydia Vandenberg, *Associate Director of Employee Engagement and Education, Sustainability Institute, PSU*
Robert Vierck, *Board, Trout Unlimited*
Denise Wardrop, *Director, Chesapeake Research Consortium*
Andy Warner, *Director of Water Initiative, PSU*
Rob Watts, *Transportation Planner, McCormick Taylor, Inc*
Dave Yoxtheimer, *President, Keystone Water Resources Center*
Cecily Zhu, *Alternative Transportation Coordinator, PSU*

In addition to those listed, thanks to all who attended these sessions.

References

1. Fourth National Climate Assessment 2018. *Key Message 6 Changing U.S. Precipitation*. https://nca2018.globalchange.gov/chapter/2/,

2. Xian, Min (2019). https://whyy.org/articles/still-reeling-from-2018-rainfall-pa-farmers-offered-emergency-usda-loan/

3. DePasquale, Eugene. Pennsylvania Auditor General. (2019). Climate Crisis: The Rising Cost of Inaction.

4. Climate Central. *Blistering Future Summers for 1,001 Cities*. https://www.climatecentral.org/news/summer-temperatures-co2-emissions-1001-cities-16583

5. Pennsylvania Department of Environmental Protection. *Pennsylvania Climate Impacts Assessment 2021*. https://www.dep.pa.gov/Citizens/climate/Pages/impacts.aspx

6. Rosenberg et al. (2018). *Vital Signs: Trends in Reported Vectorborne Disease Cases — United States and Territories, 2004–2016*.

7. Center for Disease Control. Lyme Disease Data Tables: Most Recent Year. https://www.cdc.gov/lyme/datasurveillance/tables-recent.html

8. E2 (Environmental Entrepreneurs). *Clean Jobs Pennsylvania 2020*. https://e2.org/reports/clean-jobs-pennsylvania-2020/

9. ICLEI-Local Governments for Sustainability. (2019, July). *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, version 1.2*.

10. Rosenblum, Chris. (2019, December). Green Future. State College Magazine. https://www.statecollegemagazine.com/articles/green-future/

11. Solar Energy Industries Association, SEIA. *Solar Industry Research Data*. https://www.seia.org/solar-industry-research-data

12. Pennsylvania Department of Environmental Protection. *Pennsylvania's Solar Future*. https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/SolarFuture/Pages/Pennsylvania%27s-Solar-Future-Plan.aspx

13. Sustainable Mobility for ALL. *Global Mobility Report 2017*. https://openknowledge.worldbank.org/bitstream/handle/10986/28542/120500.pdf?sequence=6

14. McMahon, Jeff. (2018). *Electric Vehicles Cost Less Than Half as Much to Drive*. https://www.forbes.com/sites/jeffmcmahon/2018/01/14/electric-vehicles-cost-less-than-half-as-much-to-drive/?sh=5128f4613f97


CENTRE REGION
COUNCIL OF GOVERNMENTS


Harris Township


COLLEGE
TOWNSHIP


STATE COLLEGE BOROUGH


Township of
FERGUSON
Pennsylvania


PATTON
1794
TOWNSHIP


HALFMOON
TOWNSHIP


CRPA
Centre Regional
Planning Agency


ICLEI
Local Governments
for Sustainability