

# Comprehensive Climate Action Plan

Miami Valley Region

**Modelling approach and  
assumptions**

September 18th 2024



# Agenda

1. Updates on the Engagement Process
2. IRA incentive opportunities
3. Regional decarbonization scenarios/pathways for the CCAP

**Update**

Engagement

SSG

# Engagement Activities

- Events: Lebanese Festival, EcoFest
- Outreach: Hotcards for library branches, and other events
- Contents: Keeping up with Miami Valley CCAP, IRA incentives, educational and communication channels, inviting people to answer the survey
- Communication Guide aligned with the modelling work
- Survey/Questionnaire

# Survey Summary

## Preliminary Results (through 9-12-2024):

- Total Responses (through 9/12/2024): 26
  - 81% Residents
  - 12% Businesses
  - 4% Do not live in Miami Valley
  - 4% Work in Greene County, live in Franklin County
- Ages
  - 33% (Ages 35-44)
  - 24% (Ages 45-54)
  - 14% (Ages 65-74)
  - 10% (Ages 75-84)
  - 10% (Ages 55-64)
- Race or Ethnicity
  - 100% (White)

# Survey Summary

## What we heard

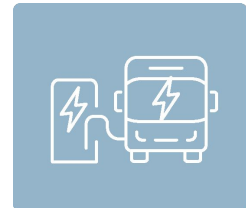


# Survey Summary



## Key insights:

- Almost 50% of contestants are interested in buying or leasing an Electric Vehicle (EV)
- A quarter mentions barriers like cost of the vehicle, and charging stations
- Although most respondents believe that the MVRPC should mostly focused on active transportation infrastructure
- A quarter would be encouraged to take more transit if there were stops closer to their origin/destination

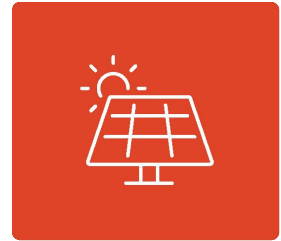


# Survey Summary

## Key insights:



- More than 80% of respondents is interested in making at least one energy efficiency improvement in their homes, either heat pumps, energy efficiency and/or water savings appliances and enhancing insulation
- And more than half of respondents are also interested in solar panels
- Most people agree that financial support, education to do it themselves and a list of recommended professionals and contractors would encourage them to make changes in their homes



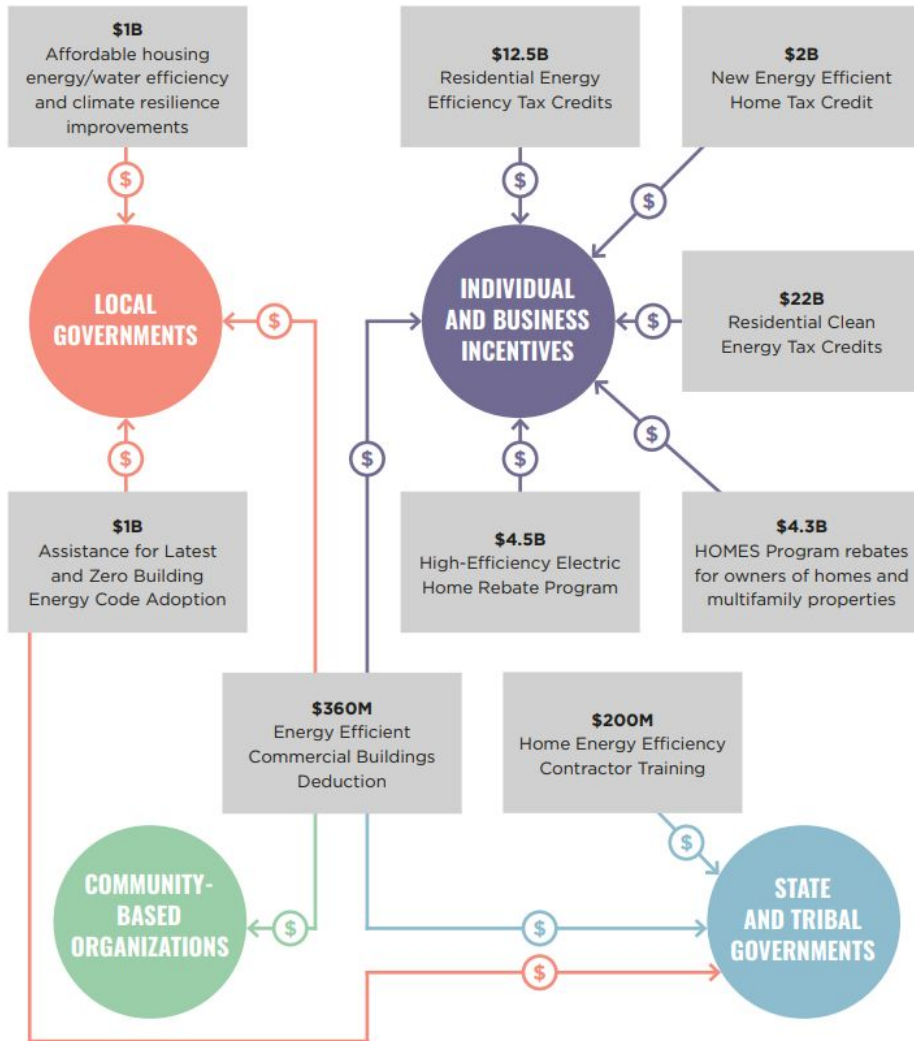


# IRA incentives

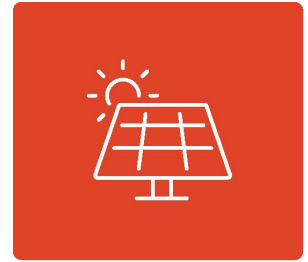
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# STRATEGIC ROLES FOR LOCAL GOVERNMENTS

- 
- APPLY** for funding that is directly available to local governments.
  - PROTECT** against detrimental impacts of new or continuing fossil-fuel facilities.
  - SUPPORT & PARTNER** with frontline communities and community-based organizations to center their priorities and secure resources.
  - ASSIST** businesses and individuals to access new tax credits and higher incentives by fostering economic inclusion and workforce development.
  - STREAMLINE** permitting processes and train staff to remove obstacles to installation of renewable energy systems, vehicle charging infrastructure, and highly efficient equipment.
  - ENGAGE & COORDINATE** across jurisdictions regionally and with states, tribes, utilities, and ports.



# HOUSING AND COMMERCIAL BUILDINGS



Source: C40, 2022. Climate Action and the Inflation Reduction Act: A Guide for Local Government Leaders.  
[https://www.c40knowledgehub.org/s/article/Climate-action-and-the-Inflation-Reduction-Act-A-guide-for-local-government-leaders?language=en\\_US](https://www.c40knowledgehub.org/s/article/Climate-action-and-the-Inflation-Reduction-Act-A-guide-for-local-government-leaders?language=en_US)

# DIRECT PAY

- **Madison, WI**
  - PV on a fire station, police station, library and engineering service building
  - Include a solar PV array with electric vehicle charging stations
  - Workforce development boosts the tax credit

[National League for Cities](#)

# Funding Options

<b>Organizations</b>	<b>Link</b>
Office of the Undersecretary for Infrastructure	<a href="https://infrastructure-exchange.energy.gov/">https://infrastructure-exchange.energy.gov/</a>
National Governors Association	<a href="https://www.nga.org/ira-resources/">https://www.nga.org/ira-resources/</a>
EPA	<a href="https://www.epa.gov/invest/epa-funding-announcements-bipartisan-infrastructure-law-and-inflation-reduction-act">https://www.epa.gov/invest/epa-funding-announcements-bipartisan-infrastructure-law-and-inflation-reduction-act</a>

[English](#) Español

## YOUR SAVINGS CALCULATOR

## See how much you could save on electric appliance upgrades

There are many savings programs for energy-efficient appliances and upgrades.  
Enter your household info to see the programs you're eligible for.

### Your household info

[Reset](#)

We're dedicated to safeguarding your privacy. [Learn more.](#)

RENT OR OWN ⓘ

Homeowner ▾

ZIP ⓘ

29002

ELECTRIC UTILITY ⓘ

Fairfield Electric Cooperative ▾

HOUSEHOLD INCOME ⓘ

\$50,000

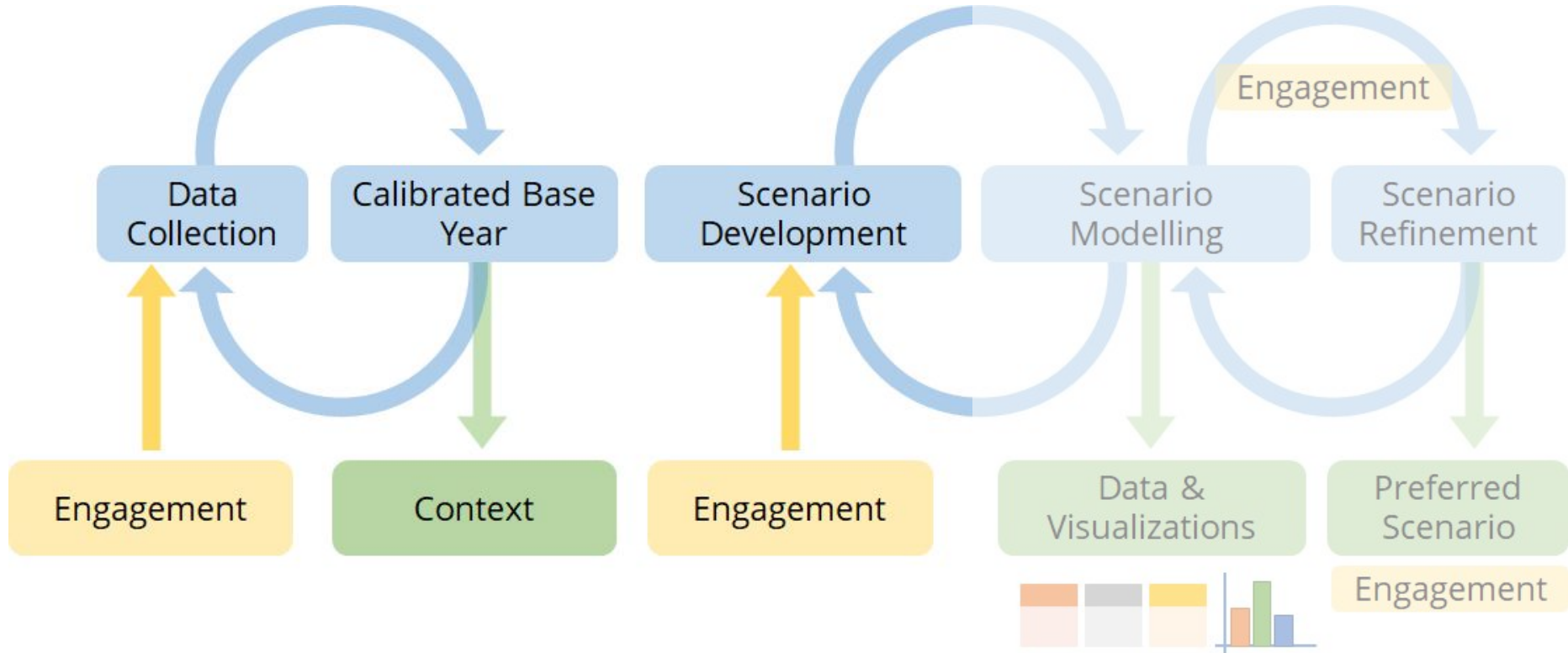
TAX FILING ⓘ

HOUSEHOLD SIZE ⓘ

# Miami Valley Region CCAP

Regional decarbonization pathways

# Project overview



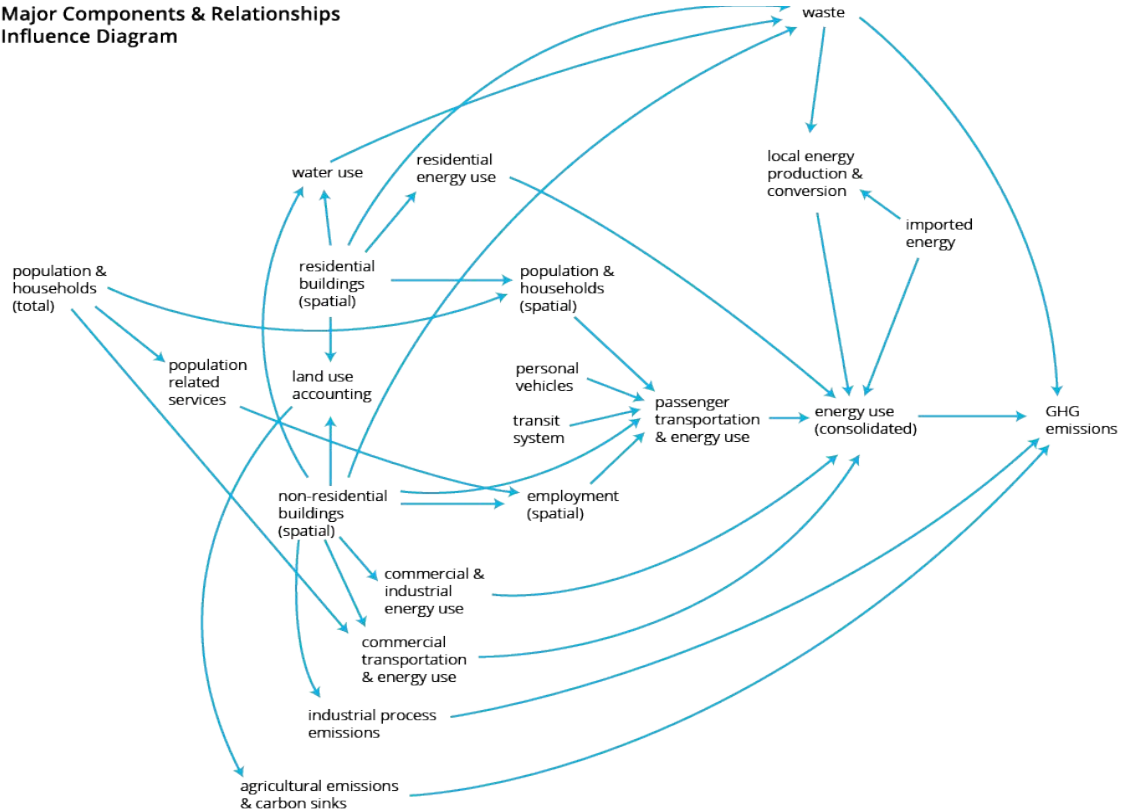


# Scenario Planning Process

Scenario development parameters fed into the model

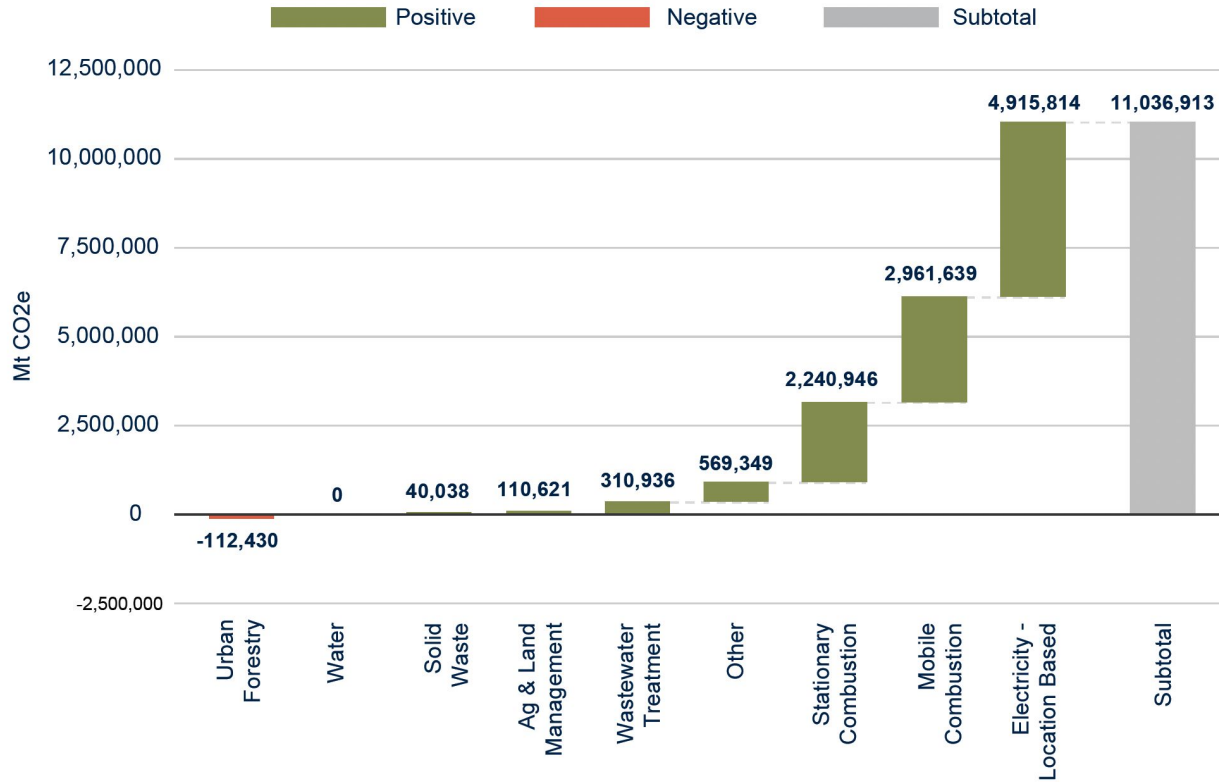
## Model Scenarios

Major Components & Relationships Influence Diagram



# MV Context

## Emissions by Subsector



# What is a scenario?

A vision of the future, an idea

Some you would **like to happen**; or, something you **wouldn't want to happen!**

## What if?

We restored the natural prairie?

The Government mandated action?

Municipalities did everything they can?

We maximized energy efficiency?

There was political alignment?

We made every household carbon negative?

We implemented the cost optimal GHG actions?

The population grew like crazy?

The microchip industry grows in leaps and bounds?

# BAU and BAP assumptions

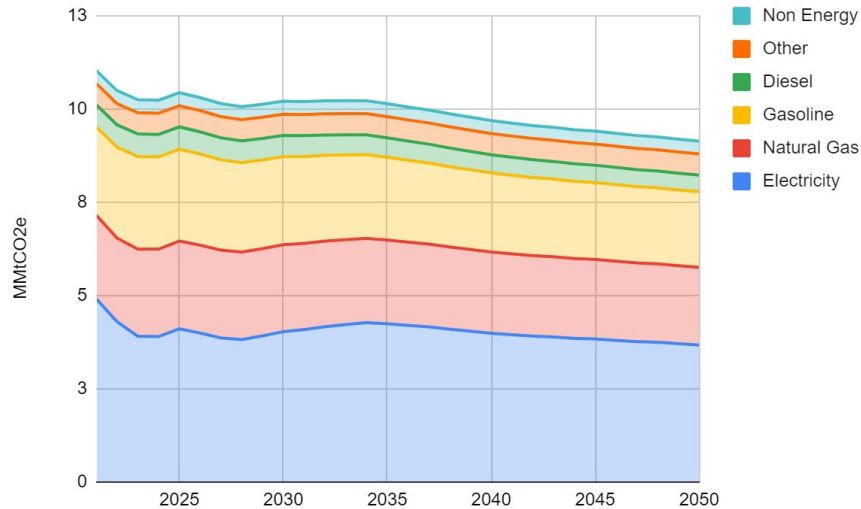
	BAU and BAP Assumption	Source
Climate		
Heating and Cooling Degree Days	<b>Heating degree days by 2050 (RCP8.5 mean):</b> Greene county: 4,400 °F Miami County: 4,600 °F Montgomery county: 4,400 °F <b>Cooling degree days:</b> Greene county: 1,600 °F Miami County: 1,700 °F Montgomery county: 1,800 °F	Climate Explorer - U.S. Climate Resilience Toolkit
Demographics and Employment		
Population Growth	Approx 849,000 by 2020 Approx 851,000 by 2050	Population by traffic zone from the Long Range Transportation Plan
Employment Growth	Approx 489,000 jobs by 2020 Approx 551,000 jobs by 2050	Employment by traffic zone from the Long Range Transportation Plan

# BAU and BAP assumptions

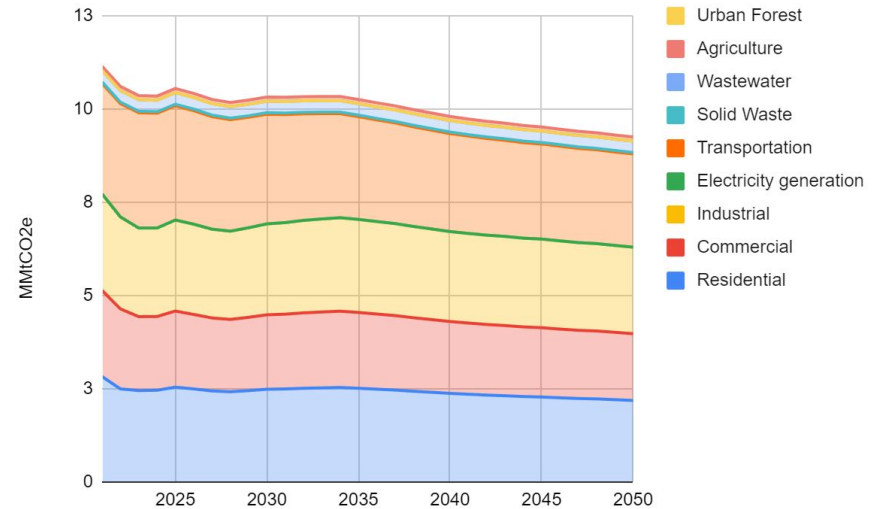
	BAU and BAP Assumption	Source
<b>Buildings</b>		
Dwelling Units	GIS information per census tract	US Census Bureau & Replica
Building energy use	Energy survey	MVRPC information
<b>Energy and Electricity</b>		
Grid Emissions Factor	CO <sub>2</sub> : 1,046.1 (lbs/MWh) by 2021 CO <sub>2</sub> : 502 (lbs/MWh) by 2050	EPA's Emissions & Generation Resource Integrated Database (eGRID) for base year & NREL 2023 Cambium model for future periods
<b>Transportation</b>		
Electric vehicles	4% growth every three years based on current trends	New passenger car <a href="#">AFV registration</a> august 2024 in Ohio

# Business as usual scenario

## Emissions by Fuel



## Emissions by Sector



# Developing a LC scenario

**Step 1:** Refine the base year (2021)

**Step 2: Business-as-Usual** (BAU) scenario

- 2022-2050
- No change in current policies and additional actions than the ones we have done already

**Step 3: Business-as-Planned** (BAP) scenario

- 2022-2050
- Current policies and plans *implemented*

**Step 4: Low-Carbon** scenarios

- How to achieve our GHG emissions goals



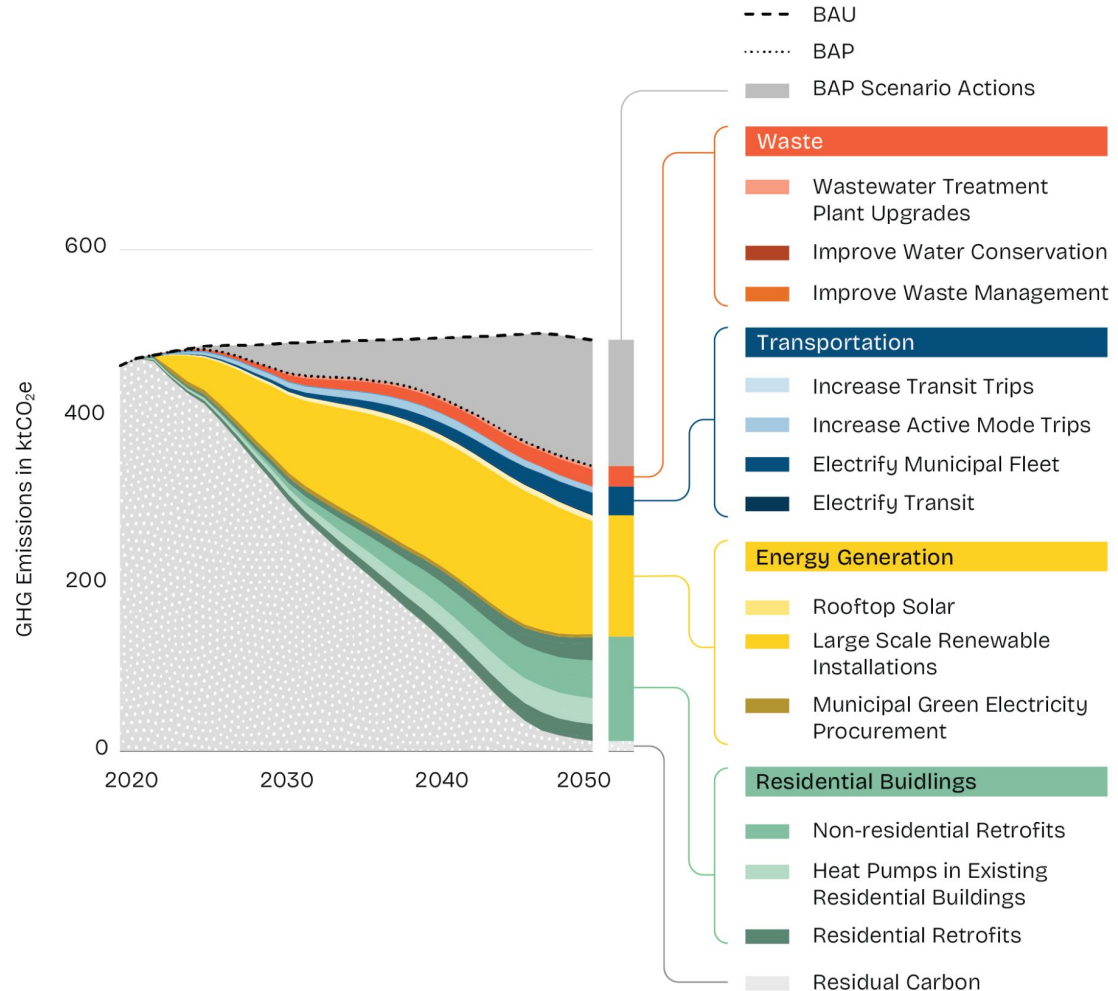
# Climate mitigation Targets

**GHG reduction milestones:** Targets for 2030, 2040 and 2050.

Low-carbon pathways based on:

- National Goals
- Ohio Goals
- Paris Agreement 1.5°C aligned

# Developing a LC scenario



## Developing a LC scenario

We can evaluate multiple scenarios for each policy,  
exploring **timing, ambition, scope**

Example Policy: Building Performance Standard		
Scenario 1	Scenario 2	Scenario 3
New buildings are 20% more efficient starting in 2035	Deep retrofits of the existing building stock by 2040	New buildings are all net zero by 2030

# BAP and LC assumptions

	BAP	Low Carbon Scenario
Demographics and Employment		
Population Growth	Employment by traffic zone from the Long Range Transportation Plan	Same as BAU
Employment Growth	Employment by traffic zone from the Long Range Transportation Plan	Same as BAU
Buildings		
Dwelling Units	GIS information per census tracts and MVRPC information of commercial buildings	TBD
Energy and Electricity		
Grid Emissions Factor	CO <sub>2</sub> : 1,046.1 (lbs/MWh) by 2021 CO <sub>2</sub> : 512 (lbs/MWh) by 2050 (low natural gas prices scenario)	CO <sub>2</sub> : 1,046.1 (lbs/MWh) by 2021 CO <sub>2</sub> : 171 (lbs/MWh) by 2050 (low renewable energy prices scenario)

# BAP and LC assumptions

	BAP assumptions	Source	LC assumptions	Source
<b>Buildings</b>				
New Buildings (residential and commercial)	Residential: equal or less to the total energy costs of a standard reference design Commercial: 80% or less than the energy costs of a standard reference design	Ohio Energy Code 2024 following the International Energy Conservation Code 2021  City of Dayton Green Buildings Standard	Low carbon buildings - Ohio Energy Code	Ohio Energy Code
Residential Retrofits	Based on IRA tax credits	IRA statistics in 2023	TBD	
Commercial Retrofits	Less than or equal to 80% of the annual energy cost of the standard reference design	Ohio Energy Code 2024	Energy usage less than 3.4 BTU/h × ft <sup>2</sup> of floor area for space conditioning purposes.	Ohio Energy Code - Commercial buildings

# BAP and LC assumptions

	BAP assumption	Source	LC assumptions
Energy			
Renewable generation	Cambium Projections by 2050: Distributed energy solar rooftops: 6.5% by 2050 Utility scale generation: 37% by 2050 Wind: 4% Battery: 12%	Cambium 2023 Data. National Renewable Energy Laboratory. <a href="https://scenarioviewer.nrel.gov">https://scenarioviewer.nrel.gov</a>	
Distributed energy generation	Projections based on use of IRA tax credits	IRA statistics in 2023	

# BAP and LC assumptions

	BAP assumptions	Source	LC assumptions
Transportation / Mobility			
Light Duty Vehicle Electrification	IRA tax credits	IRA statistics	
Light and heavy duty fuel vehicle economy	Light duty and passenger cars: 2031: Approx. 50.4 MPG, HDPUV of roughly 2.851 gallons per 100 miles in 2035	CAFE standards update 2024 NHTSA Final Rule for CAFE and Heavy Duty Pickup Vans (HDPUV) Standards	
Light and heavy duty GHG emission standards	<p>Passenger cars and light trucks: 170 grams/mile in 2027 until 85 grams/mile in 2032</p> <p>HDPUV 461 grams/mile in 2027 to 254 grams/mile in 2032</p>		

# BAP and LC assumptions

	BAP assumptions	Source	LC assumptions
Transportation / Mobility			
Transport Mode Shares	Based on the Regional profile - Commuting to work in the region (includes 3 counties + part of warren) 84% drove alone 8% carpool 2% public transportation 2% bike or walked	Regional profile - Commuting to work in the region: MVRPC data	Target by 2050 Ohio-wide: 0.25% annual increase in walking to work, reaching 3.55% walk to work in five Years. 0.1% annual increase in biking to work, reaching 0.8% bike to work in five years
EV Charging Infrastructure	Charging ports planned and built out as part of the New Electric Vehicle Infrastructure Plan of Ohio by 2027 Locations: Troy and Dayton.	Ohio NEVI plan	



**BAP and LC  
assumptions**

**In-person  
fun activities**

## Activity Objectives

1. **Review** the scenario parameters for the *BAP scenario*
2. We want to **hear your opinions**, add a post-it for either:
  - a. Corrections and suggestions
  - b. New assumptions
  - c. Comments and questions
3. **Comment** on assumptions for a *Low Carbon Scenario*

**CCAP**

Next steps

**SSG**

## Next steps

1. Review inputs and propose Low Carbon scenarios
2. Evaluate LC scenarios
3. Present the draft results
4. Revise according to feedback

Keep on  
commenting  
in the  
following  
online Miro  
board



[https://miro.com/app/board/uXjVLeal5Ok=/?share\\_link\\_id=402777639973](https://miro.com/app/board/uXjVLeal5Ok=/?share_link_id=402777639973)

# THANK YOU

Vist [www.mvrpc.org](http://www.mvrpc.org) for more information and to submit comments.

Yuill Herbert  
Deryn Crockett  
Coby Williams  
Francisca Cid

