Climate Action Planning

and neighborhood climate resilience

Presented by Jessie Muncie, Graduate Assistant DMMPC
*Plan itself was developed by entire Planet Muncie Committee

Resilient Climate Action Plan

Muncie is currently drafting its Climate Action Plan (CAP) to help reduce emissions and ensure resiliency. In conjunction with this plan, we'd like to showcase the strategies we can use to increase climate resiliency across the city.

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Background

Planet Muncie Committee

A subcommittee of the Muncie Action Plan's
Taskforce 5: Managing Community Resources
Members of Planet Muncie:

Jason Donati
Marta Moody
Lorey Stinton
Heather Williams
Julie Pichonnat

Councilman Troy Ingram
Robert Koester
Donna Browne
Lucas Pint
Jessie Muncie

Relevant Organizations

Planet Muncie Committee

Suggested and oversaw plan development

Ball State University

Offered expertise and a graduate assistant

Delaware-Muncie Metropolitan Plan Commission

Oversaw plan development and advised GA

Indiana University: Environmental Resilience Institute

Supplied intern for GHG inventory

ICLEI - Local Governments for Sustainability

Offered CAP expertise, graphing software, and a stable resource for questions

What is the timeline for Muncie's CAP?

Summer 2019

Environmental Resilience Institute intern (Nicky Harrison) helps Muncie create its Greenhouse Gas Inventory

April 5th, 2021

Resolution to create Resilient Muncie Climate Action Plan passed by City Council and signed by Mayor

Summer 2022

Graduate assistant chosen and begins work on plan

May 2022

Plan will be completed and submitted for City Council and Mayoral approval

2008 Ball State University completes GHG inventory and CAP → **2013** Ball State University updates CAP to include geothermal

Climate Resiliency Resolution 9-21 Passes Unanimously

FILED
APR 05 2021
Belinda Munson
MUNCIE CITY CLERK

AMENDED RESOLUTION NO.: 9-21

A RESOLUTION OF THE COMMON COUNCIL OF THE CITY OF MUNCIE, INDIANA, TO PARTNER WITH THE MUNCIE ACTION PLAN, BALL STATE UNIVERSITY, LOCAL BUSINESSES, AND OTHER ORGANIZATIONS TO REDUCE CARBON EMISSIONS, INCREASE ENERGY EFFICIENCY AND RENEWABLE ENERGY USE, AND TO CREATE A RESILIENT MUNCIE CLIMATE ACTION PLAN TO BENEFIT THE ECONOMY, PROMOTE PUBLIC HEALTH, AND PROTECT OUR ENVIRONMENT

WHEREAS, The City of Muncie currently is taking multiple measures to reduce blight, clean up brownfields, enhance public parks, create more green space, protect the White River and other waterways, and improve the quality of life of all citizens; and

WHEREAS, climate action attracts jobs, new residents, and economic development opportunities that will positively contribute to the development of a sustainable, livable city with a strengthened economy and higher quality of living as well as increase energy efficiency activity regarding vehicles, buildings, electricity, and the community of Muncie; and

WHEREAS, Muncie citizens have voiced their support for climate action initiatives, including a formal climate action plan to be written by community constituents and leaders, in public input processes such as the *Vision 2021* economic development plan and three iterations of the Muncie Action Plan; and

What is a Climate Action Plan?

A Climate Action Plan is a detailed gameplan for how a city (or other entity) can reduce its greenhouse gas emissions and promote resiliency. It includes:

1. Greenhouse Gas Inventory
2. GHG Forecasting
3. Emissions Reduction Strategies
4. Funding Sources

1

What other Indiana cities have Climate Action Plans?

Bloomington
2021

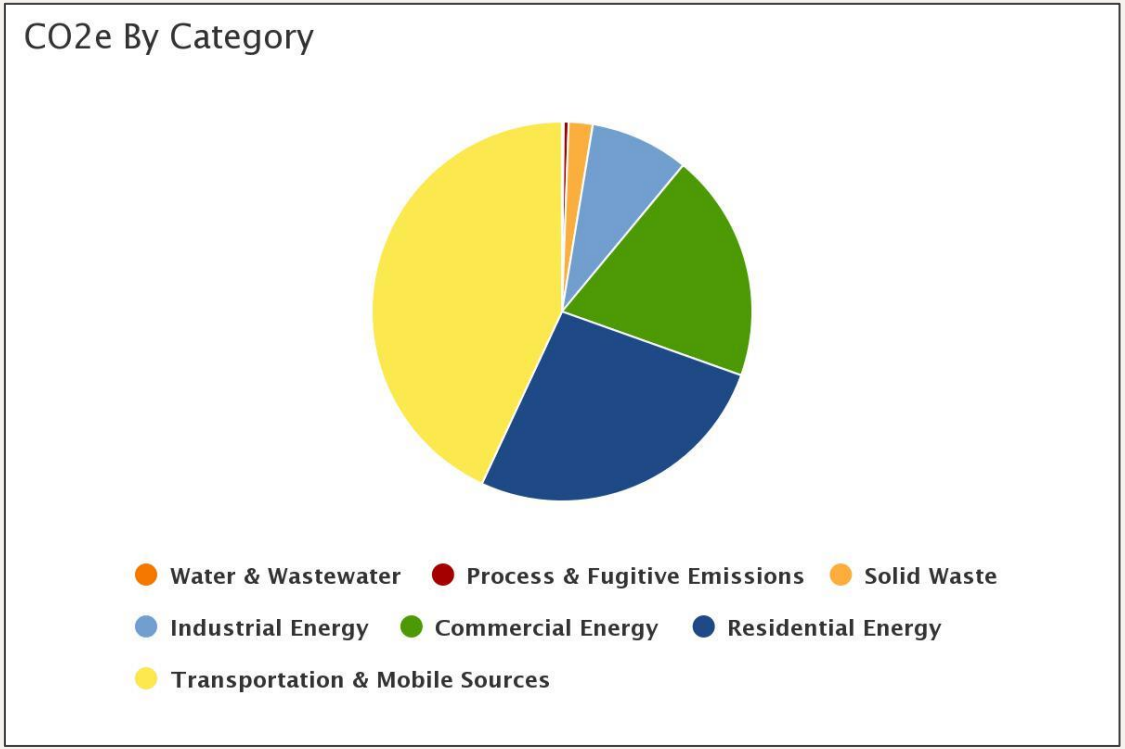
Goshen
2021

Zionsville
2020

South Bend
2019

Richmond
2021
(pending city approval)

Evansville
2021



CO2e breakdown from Muncie's Greenhouse Gas Inventory[2]

Greenhouse Gas Inventory

- **Resilience Institute of Indiana** conducted inventory
- Emissions recorded for **2017**
- **Transportation & Mobile** sources emitted the most CO2e for both Muncie and Delaware county

GHG Inventory:

Emission Breakdown

Muncie 2017	
Sector	**CO2e**
Transportation & Mobile Sources	224,809
Residential Energy	130,943
Commercial Energy	123,572
Industrial Energy	41,964
Solid Waste	10,227
Process & Fugitive Emissions	2,783
Water & Wastewater	765
Total	**535,063**

CO2e breakdown from Muncie's Greenhouse Gas Inventory[2]

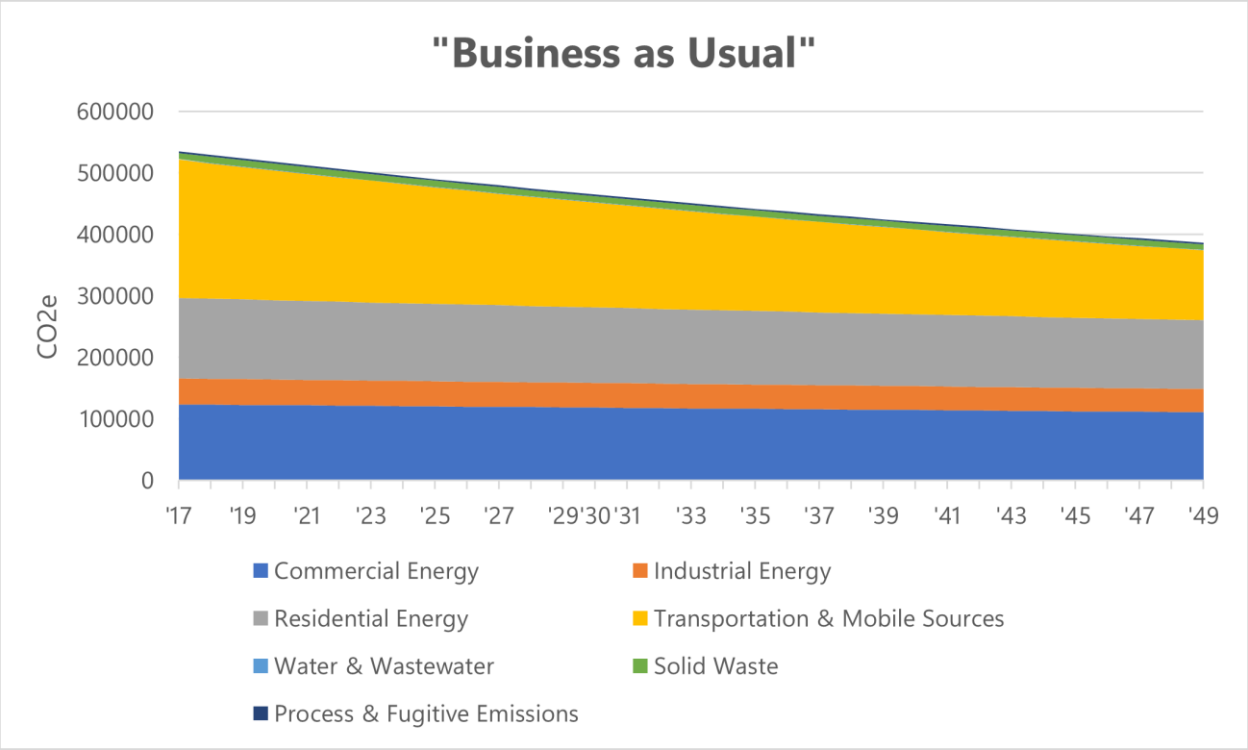
What can we do with this information?

Plan for the future! Through *forecasting*.

GHG Forecasting

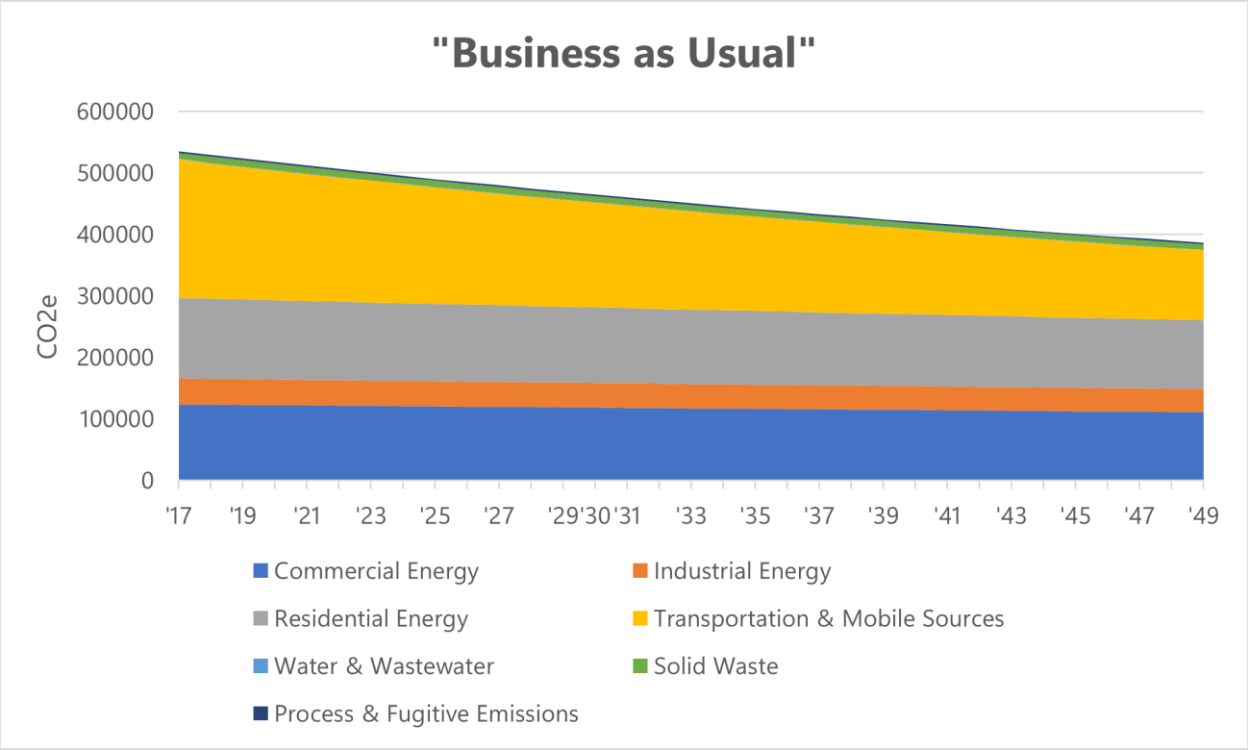
If Muncie does nothing to reduce it's GHG emissions, this is called the "**Business as Usual**" scenario.

Still not enough reduction.



Why do emissions reduce?

- **(CAFE) Standards** are continually revised
- Began in **1978**
- 2021 combined fleet-wide fuel economy standard was **40.3-41.0 mpg**.



So if we want to see greater reductions, what can we do?

Look to the Race to Zero for ideas!

What is the Race to Zero?

United Nations-promoted pledge made by 700+ cities across the globe to:

- ✓ **drastically reduce** emissions by 2030
- ✓ achieve **zero emissions** by 2050

What would joining mean for Muncie?

ICLEI's High Impact Action Analysis Summary Report found that Muncie would need to **reduce emissions by 65%** by 2030 to achieve **zero emissions** by 2050

How would we get there?

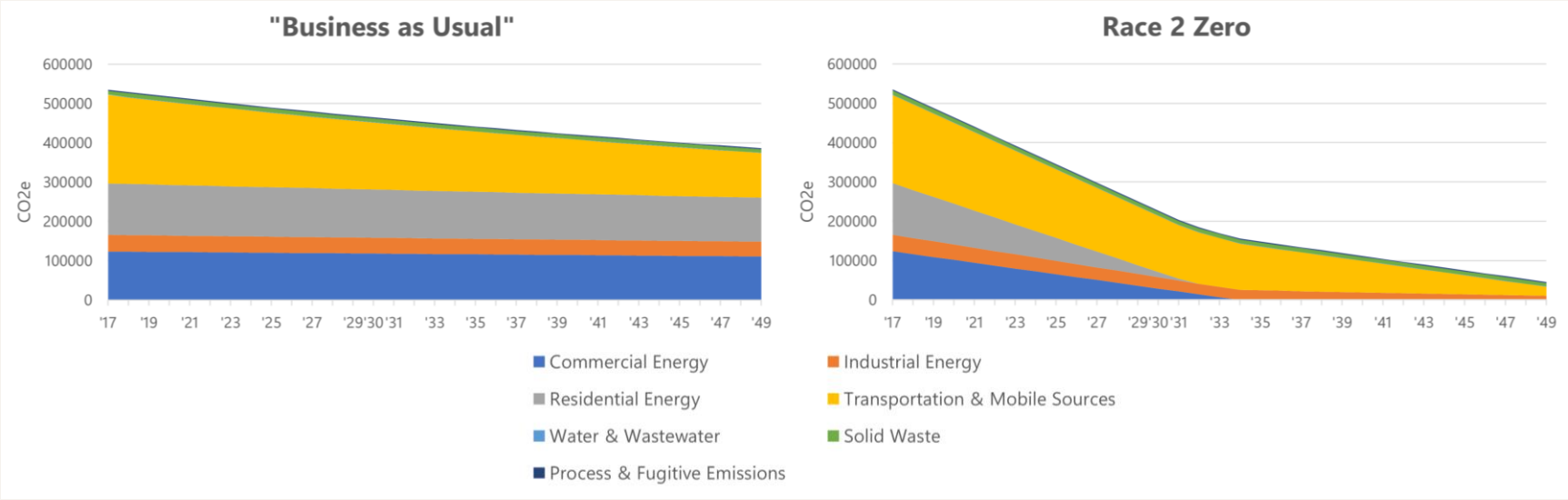
HIA Overview			
Type	**Name**	**Net Reduction (MT CO2e)**	**Description**
Grid Decarbonization	CES	**137,950**	Clean Energy Standard: 80% Reduction in carbon intensity (kg CO2/MWH) by 2030.
High Level VMT Reduction	Aggressive (10% VMT Reduction)	**12,669**	10% Reduction in total VMT
On-Road Electric Vehicles Adoption	Moderate (4.5% Annual Growth)	**24,005**	22.5% of VMT is EV by 2030. This action influences an increase in Residential & Commericial buildings electiricty emissions.
Commercial Building Efficiency	IECC 2018	**935**	All new buildings including 1% of existing Sq FT (renovations and turnover) will meet IECC 2018 (36.95% reduction in building EUI)
Residential Building Efficiency	IECC New + 5% Existing	**1,929**	All new buildings and 1% of existing Sq FT (renovations and turnover) will meet IECC 2018 (36.95% reduction in building EUI) & 5% Existing Sq FT (renovations and turnover) EUI is reduced by 20%.
Commercial Building Electrification	5% EB Electrified	**16,620**	5% of existing SF per year is electrified. This action influences an increase in Commericial buildings electiricty emissions.
Residential Building Electrification	10% EB Electrified	**64,617**	10% of existing SF per year is electrified. This action influences an increase in Residential buildings electiricty emissions.

from ICLEI's High Impact Action Analysis Summary Report: Muncie, IN 2017[3]

Implement these strategies:

- grid **decarbonization**
- **reductions** in vehicle miles traveled
- **increased** electric vehicle adoption
- **increased** commercial and residential building energy efficiency
- **increased** commercial and residential building electrification

What would this look like?



Emissions Comparison			
Sector	CO2e Emissions by Year 2050		% Change
	Business as Usual	Race 2 Zero	
Transportation & Mobile Sources	113,737	22,855	-79.91%
Residential Energy	111,721	0	-100.00%
Commercial Energy	110,817	0	-100.00%
Industrial Energy	37,633	10,011	-73.40%
Solid Waste	9,172	9,172	0.00%
Process & Fugitive Emissions	2,496	2,496	0.00%
Water & Wastewater	686	686	0.00%
Total	386,262	45,219	-88.29%

(from Muncie's Climate Action Plan)

GHG Forecasting

- **88.29%** difference between the "Business as Usual" emissions and "Race to Zero" by **2050**
- Biggest percentage drop would be **Transportation & Mobile Sources**
- **Residential Energy** and **Commercial Energy** would be zero by 2050

How feasible are these strategies?

Grid Decarbonization

Not within government control

Reduction in Vehicle Miles Traveled

Government can influence

Increased Electric Vehicle Adoption

Government can influence

Increased Commercial and Residential Building Energy Efficiency

Government can influence

Increased Commercial and Residential Building Electrification

Government can influence

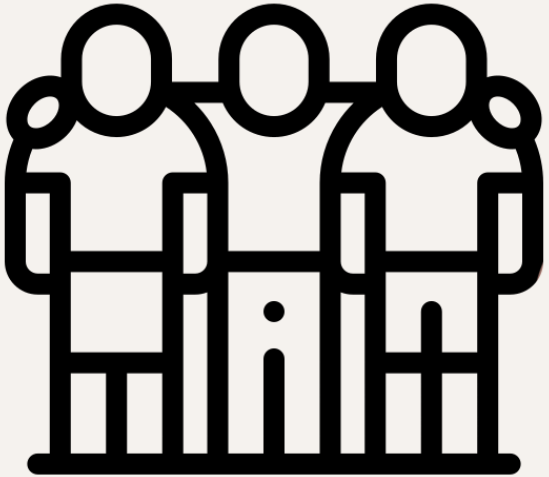
The City of Muncie cannot fully control any of these.

How will we integrate these concepts?

Emissions Reduction Strategies

Muncie needs policies that will:

- ✓ Draw from **Race to Zero** strategies
- ✓ Be **actionable**
- ✓ Be **measurable**
- ✓ Emphasize **resiliency**
- ✓ Ensure **non-partisanship**
- ✓ Improve Muncie **in the long term**



Strategies

Strategies

Energy

- Residential
- Commercial
- Industrial
- Governmental
- Institutional

Transportation

Muncie Sanitary District

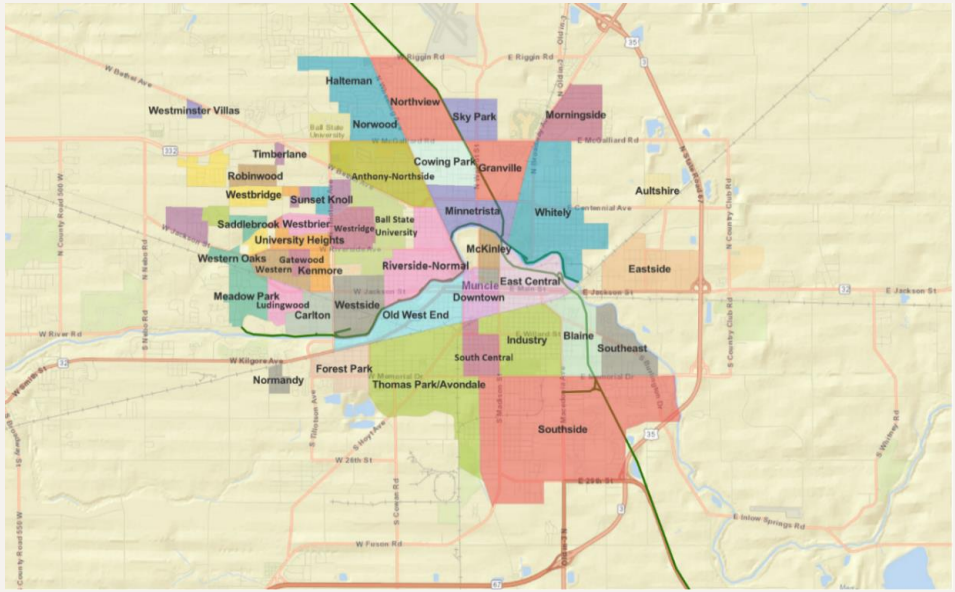
- Water & Wastewater
- Solid Waste

Equity

Nature

Adaptation for Natural Disasters and Stressors

Residential Energy

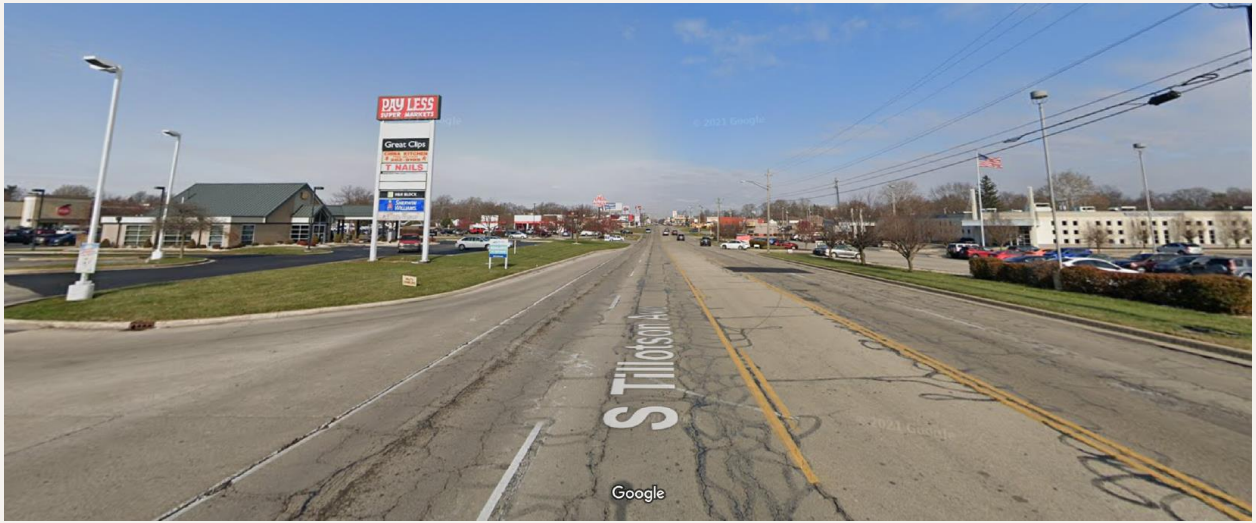


Muncie Neighborhood Map[4]

Residential Energy

- ❑ Energy-efficient appliance information campaign
- ❑ Connect residents with solar panel companies
- ❑ Promoting community-wide solar education
- ❑ Promote weatherization programs
- ❑ Inform residents how they can conduct energy audits on their homes
- ❑ Promote residential energy grants and funding

Commercial Energy



Looking north on Tillotson Ave[5]

Commercial Energy

- Energy-efficient appliance information campaign
- Connect business owners with solar panel companies
- Inform business owners how they can conduct energy audits on their businesses
- Promote commercial energy grants and funding

Industrial Energy

1724 E. 29th Street[6]

Industrial Energy

- Capitalize on the brownfield site list “Brownfields to Brightfields” developed by BSU students
- Partner with local institutions, government agencies, and nonprofits to remediate sites
- Continue to purchase brownfield sites for renewable energy sites
- Taking advantage of existing grants and funding sources to clean up sites

Governmental Energy

Muncie city hall[7]

Governmental Energy

- ❑ Energy audits of all municipal buildings
- ❑ Add energy efficient appliances to city buildings
- ❑ Convert all city lights to LEDs
- ❑ Establishing a Sustainability Commission to oversee the plan
- ❑ Install solar panels where possible
- ❑ Convert vehicles to alternative fuels/electric
- ❑ Adopt no-idle policy for government vehicles *or* run anti-idling campaign
- ❑ Electrifying government buildings
- ❑ Enroll Muncie government buildings in a recycling program
- ❑ Explore geothermal heating and cooling for municipal buildings based on Ball State's example
- ❑ Taking advantage of existing grants and funding sources

Institutional Energy

Indianapolis Airport solar farm[8]

Institutional Energy

- ❑ **BSU:** Raise LEED certification goals to Gold
- ❑ **BSU:** Pursue innovative ways to reduce carbon emissions
- ❑ **BSU & Ivy Tech:** Partner on existing energy initiatives
- ❑ **BSU & Ivy Tech:** Partner on environmental degree programs
- ❑ **BSU & Ivy Tech:** Begin and improve campus-wide recycling programs
- ❑ **BSU & Ivy Tech:** Add more charging stations
- ❑ **BSU & Ivy Tech:** Take advantage of existing grants and funding sources

Transportation

Kitselman Bridge in Muncie[9]

Transportation

- ❑ Add more electric charging infrastructure
- ❑ Continue purchasing hybrid (and hopefully electric) MITS buses
- ❑ Continue adding energy-efficiency features to MITS bus facilities
- ❑ Expand and improve local transit
- ❑ No-Idling Campaign
- ❑ Replace certain stoplights with roundabouts
- ❑ Promote/mandate mixed-used properties in downtown Muncie through incentives or zoning

Transportation

- ❑ Reevaluate minimum parking requirements
- ❑ Add more bike lanes/paths
- ❑ Improve sidewalk/ bicycle infrastructure
- ❑ Ensure adequate crosswalks
- ❑ Enhance streetscapes to include street trees
- ❑ Take advantage of existing grants and funding sources to reduce emissions

Muncie Sanitary District

Source: Sanitary District[10]

Muncie Sanitary District

- ❑ Continue its CNG use and look into installing more solar systems on their properties
- ❑ Finish the sustainability plan that district started
- ❑ Continue to purchase vehicles using alternative sources of fuel
  - 24 vehicles currently
- ❑ Take advantage of existing grants and funding sources

Water & Wastewater

Water & Wastewater

- ❑ Continue the process of separating its sewage and stormwater pipes
- ❑ Look into installing a system which could turn methane emissions into energy
- ❑ Take advantage of funding sources when made available

Solid Waste

Solid Waste

- ❑ Support plant-rich diets through public information campaign
- ❑ Exploring eliminating blue bags to reduce plastic
- ❑ Always be aware of ways to improve the consumer recycling program
- ❑ Expand blue bag pickup locations
- ❑ Incentivize residents to recycle and email regular pro-recycling information
- ❑ Promote local environmental efforts through monthly email newsletter
- ❑ Form a large-scale composting operation
- ❑ Take advantage of funding sources when made available

Equity

Urban Light CDC's South Central Community Garden[13]

Equity

- ❑ Monitor other emissions strategies to ensure they are equitable
- ❑ Promote and support local community equity and environmental resilience work
- ❑ Establish and promote community gardens
- ❑ Take advantage of existing grants and funding sources

Nature

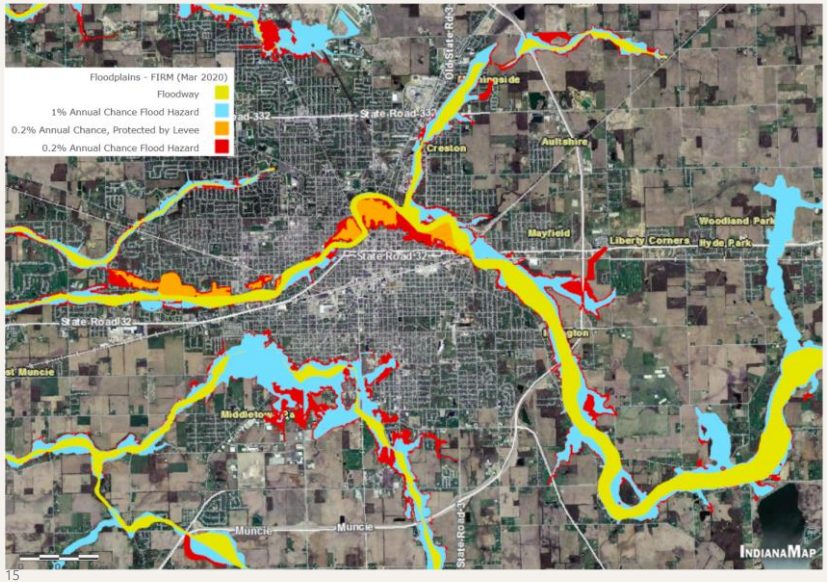
Riverside-Normal tree planting in 2021[14]

Nature

- ❑ Continue tree planting after the 1000 trees in 1000 days program
- ❑ Update tree canopy inventory every 5 years
- ❑ Partner with Redtail Land Conservancy to establish more conservation land trusts
- ❑ Replace a percentage of city-owned grass with native/perennial plants
- ❑ Take advantage of existing grants and funding sources

Adaptation

Floodplains - Flood Rate Insurance Maps (FIRM) (2020)



Adaptation

- ❑ Join FEMA's Community Rating System
- ❑ Purchase all land in floodplain
- ❑ Increase development standards in floodplain
- ❑ Recommend urban growth boundary
- ❑ Continue to improve our stormwater infrastructure and pursue green infrastructure alternatives
- ❑ Take advantage of existing grants and funding sources

Funding Sources

Potential Funding Sources

Grants and Tax Credits

Energy	
Residential:	9 sources
Commercial:	7 sources
Industrial:	5 sources
Governmental:	2 sources
Institutional:	2 sources
Transportation:	7 sources

Muncie Sanitary District:	**4 sources**
Water & Wastewater	0 sources
Solid Waste	0 sources
Equity:	**4 sources**
Nature:	**2 sources**
Adaptation for Natural Disasters & Stressors:	**3 sources**

Total: 45 sources

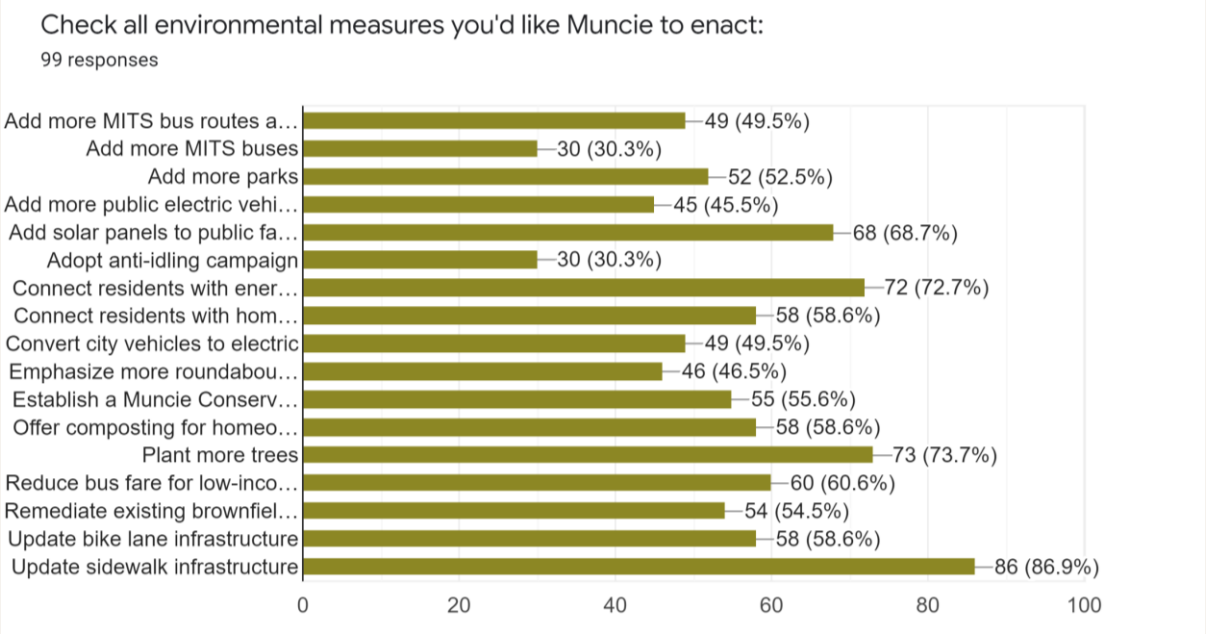
Survey

Survey

99 responses so far

Distributed through:

- Fliers around BSU
- Promotion at IDEAS Conference
- Inclusion in April Muncie Action Plan Newsletter
- Word of mouth



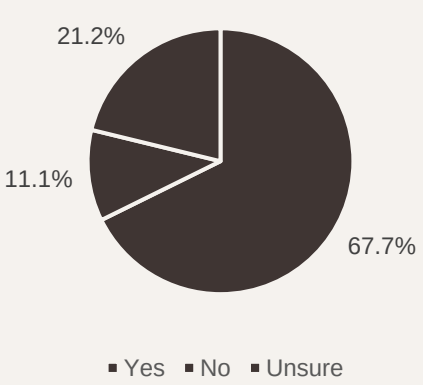
Survey

Most Popular Environmental Measures

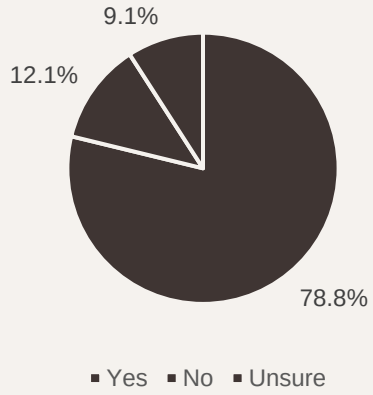
1.	Update sidewalk infrastructure	86.9%
2.	Plant more trees	73.7%
3.	Connect residents with energy-saving programs	72.7%
4.	Add solar panels to public facilities	68.7%
5.	Reduce bus fare for low-income residents	60.6%

Survey

Should Muncie have an office of sustainability or a dedicated sustainability officer?



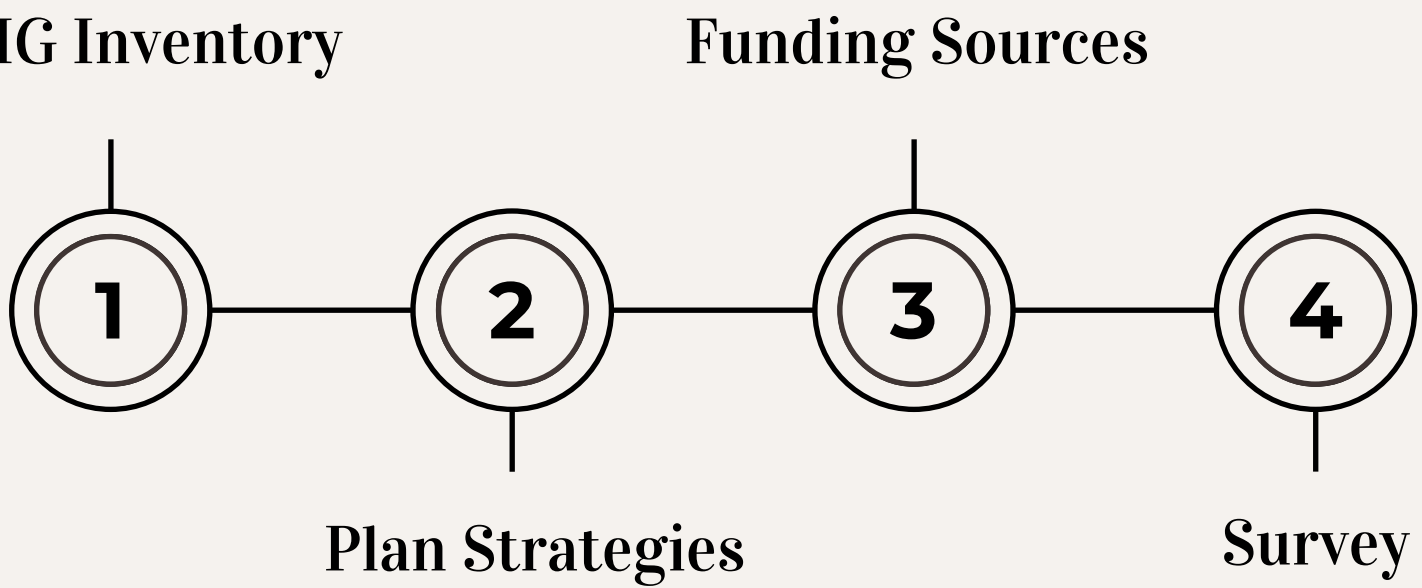
Would Muncie be a more attractive place to live/work if it took proactive measures towards climate resiliency?



Survey

To learn more about what kind of environmental measure you'd all like to see Muncie take, we've made a Google Forms survey for you to fill out.

In Summary


GHG Inventory
Funding Sources
1
2
3
4
Plan Strategies
Survey

Any questions?

Notes

1: [*Photograph of water body*], n.d., online image, City of Bloomington, https://bloomington.in.gov/sites/default/files/2021-04/Bloomington%20CAP%2001%20Exec%20Summary%20and%20Intro.pdf

2: N. Harrison, M. Moody, L. Stinton, *Muncie & Delaware County: 2017 Inventory of Community Greenhouse Gas Emissions* (Muncie-Delaware Metropolitan Plan Commission, 2019), PDF, [unpublished]

3: H., Miller, *High Impact Action Analysis Summary Report: Muncie, IN 2017* (ICLEI USA, 2022), PDF, [unpublished]

4: City of Muncie, IN, Map of Neighborhood Districts in Muncie [map], scale undetermined, generated by Jessica Muncie; using "Muncie GIS Resources Map for Neighborhoods", April 25, 2022, https://delcogis.maps.arcgis.com/apps/mapviewer/index.html?webmap=f9e36453d4f446b5bc090ffd4ae7c8d3

5: *912 Tillotson Ave*, 2021, online image, Google Street View, https://www.google.com/maps/@40.1860899,-85.4191547,3a,75y,2.07h,91.09t/data=!3m7!1e1!3m5!1sQ6hzYhbfe47jGFeHmHqCxw!2e0!6shttps:%2F%2Fstreetviewpixels-pa.googleapis.com%2Fv1%2Fthumbnail%3Fpanoid%3DQ6hzYhbfe47jGFeHmHqCxw%26cb_client%3Dmaps_sv.tactile.gps%26w%3D203%26h%3D100%26yaw%3D58.709244%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192

Notes

6: “Brownfield Redevelopment One Grant At A Time”, Kansas State University Technical Assistance to Brownfields Program (TAB), August 12, 2020, https://www.ksutab.org/?ResponseView=TABResourceDownloadView&id=4219

7: K. Roysdon, *Muncie City Hall*, n.d., online image, The Star Press, https://www.thestarpress.com/story/news/local/2018/12/18/bedbugs-shut-down-muncie-city-hall/2347353002/

8: “IND Solar Farm Collaboration”, Ball State University, accessed April 25, 2022, https://www.bsu.edu/academics/centersandinstitutes/cote/sustainability/indsolarfarm

9: [*Image of Kitselman Bridge*], n.d., online image, Cardinal Greenways, https://cardinalgreenways.org/kitselman-bridge-opening/

10: “East Central Indiana's First Compressed Natural Gas Station.”, Muncie CNG, accessed April 25, 2022, https://www.munciecng.com/

11: [*Image of flexible water pipes*], n.d., online image, Muncie Sanitary District, https://www.munciesanitary.org/departments/sewer-maintenance/

12: [*Image of recycled bottles and cans*], n.d., online image, Muncie Sanitary District, https://www.munciesanitary.org/departments/recycling/

13: [*Urban Light CDC South Central Community garden in Muncie*], n.d., online image, Urban Light CDC, https://www.urbanlightcdc.org/neighborhood-engagement/

Notes

14: *Riverside-Normal City Neighborhood Association*, [*Riverside-Normal City Neighborhood Association local tree planting in 2021*], 2021, online image, Facebook, https://www.facebook.com/rncmuncie/photos/pcb.4907448292622518/4907447145955966

15: Maps Indiana, 202 FEMA Floodplain Map of Muncie [map], scale undetermined, generated by Jessica Muncie; using “Floodplains - Flood Rate Insurance Maps (FIRM) (2020)”, April 22, 2022, https://maps.indiana.edu/previewMaps/Hydrology/Floodplains_FIRM.html