A²Zero Carbon Neutrality Plan & Office of Sustainability and Innovations Work Session
- Take 2 -

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THANK YOU

Office of Sustainability and Innovations Staff

City Transportation Unit, Information Technology Unit, Community Services, and other Service Units

Technical Advisors

Partner Organizations

Members of the Public

Peer Communities

City Council Resolution

November 4, 2019: R-10-2103

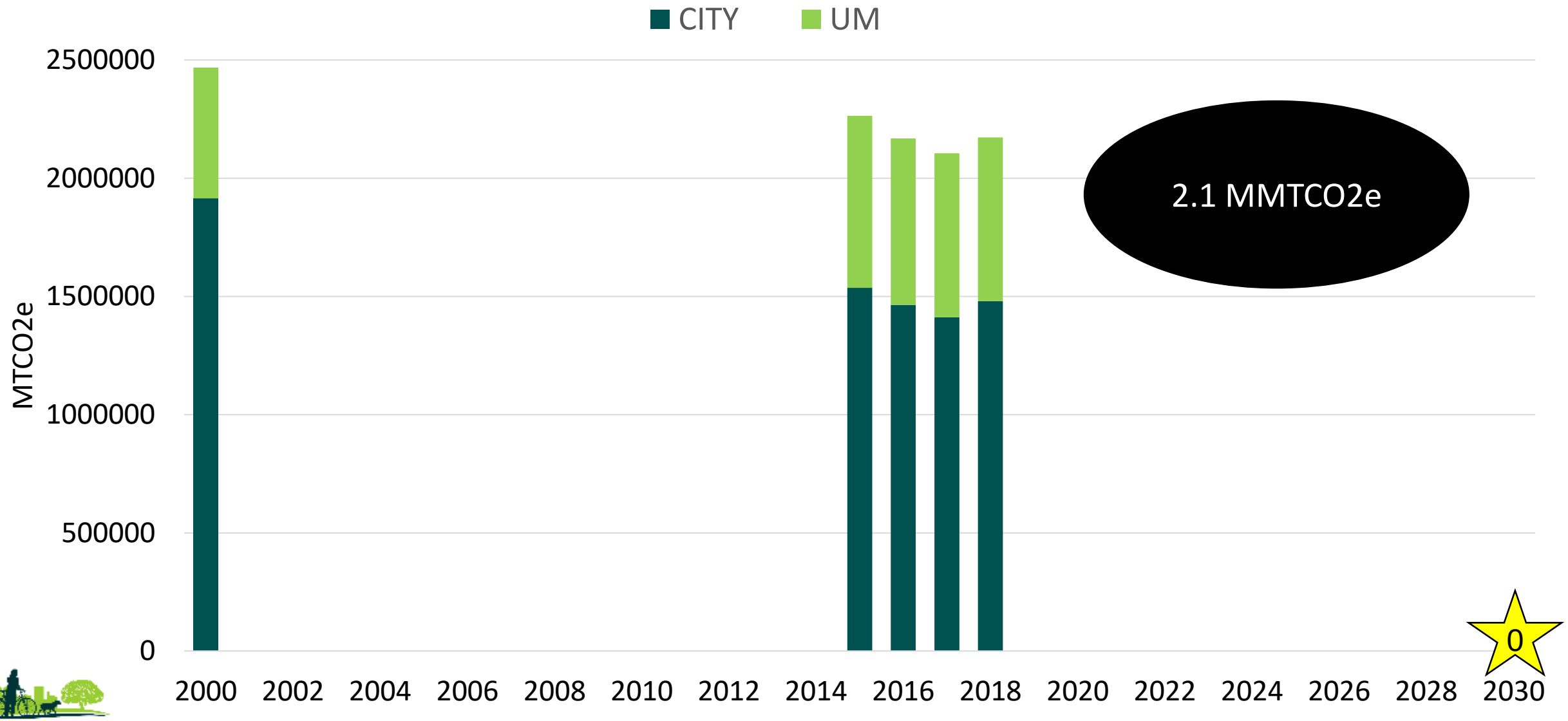
- **Declare a climate emergency and commit to taking action as a result of this declaration**
- **Support a public engagement process, beginning immediately, that helps outline how the entire Ann Arbor Community could achieve carbon neutrality by the year 2030**
- **Develop a draft plan for how the Ann Arbor community could achieve carbon neutrality to be presented not later than March 31st, to support presentation on Earth Day 2020**
- **Design and execute a community engagement process that culminates with a draft strategy for how the Ann Arbor community could achieve carbon neutrality around the year 2030**
- **Seek and facilitate collaboration with the University of Michigan and the PCCN to create and realize the 2030 Carbon Neutral Ann Arbor Plan**
- **Consider the likely outcomes of the in-development 2030 Carbon Neutral Ann Arbor Plan when developing the FY21 Budget Planning process and, ultimately, the FY21 Budget**

A2ZERO

EQUITABLE • SUSTAINABLE • TRANSFORMATIVE

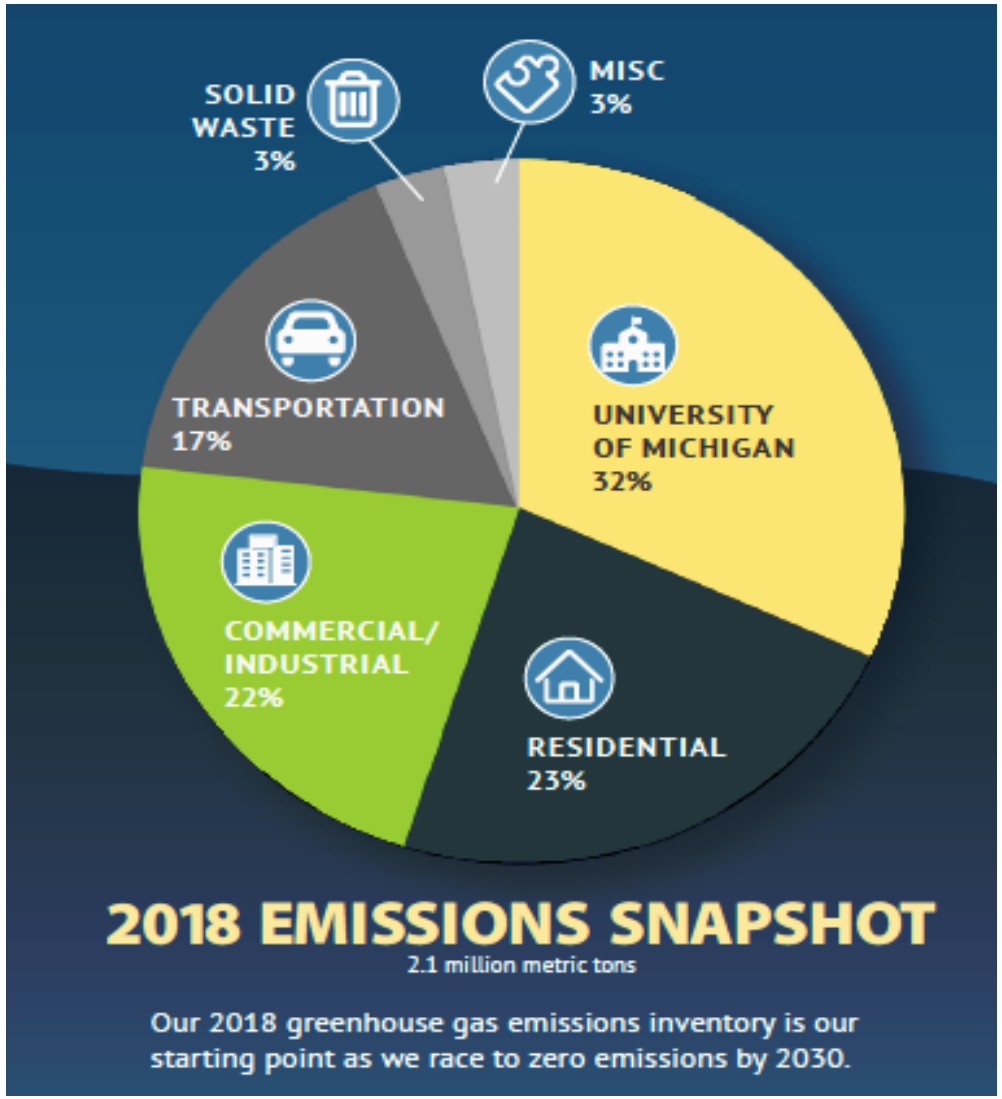
The Charge

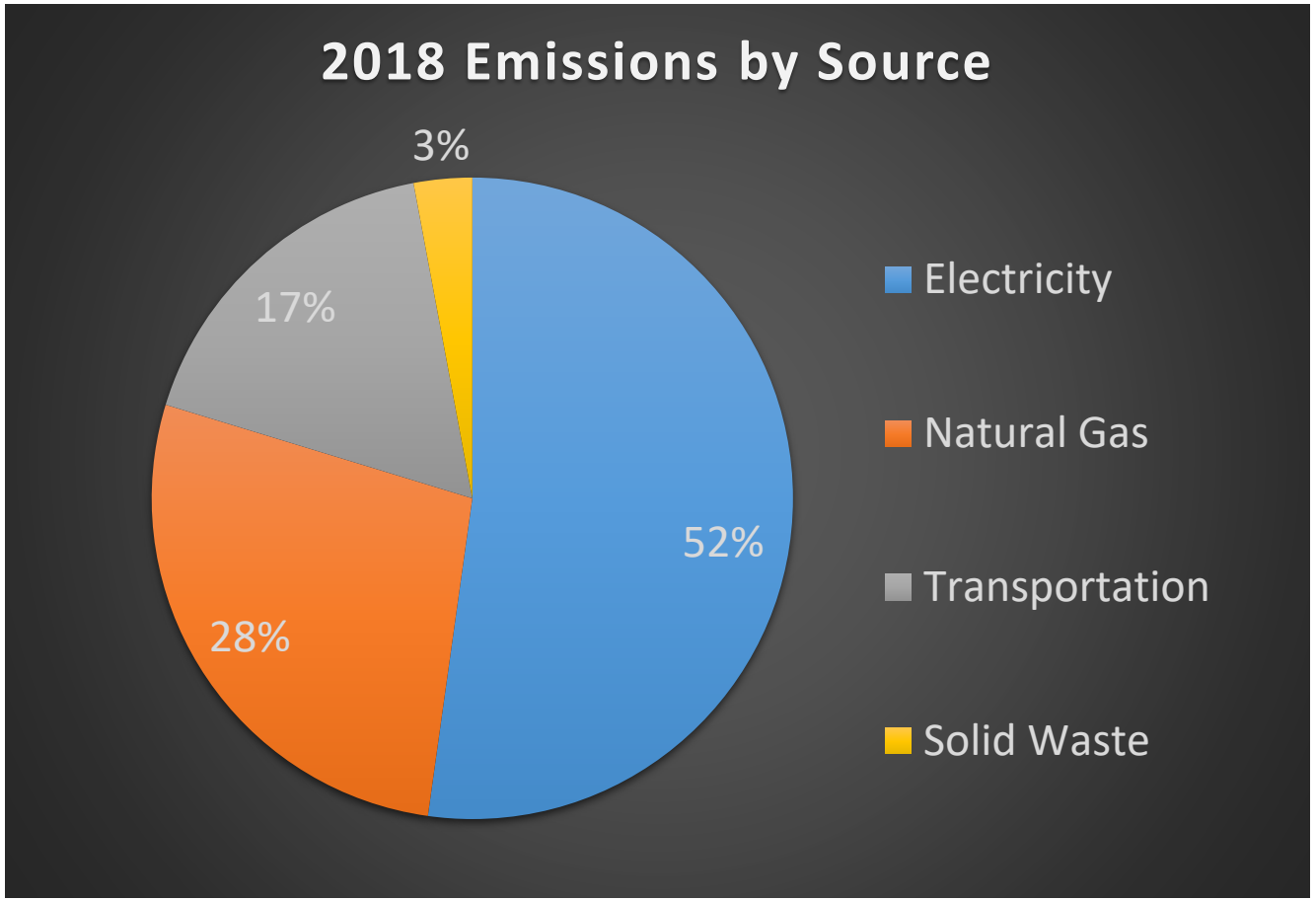
The Charge



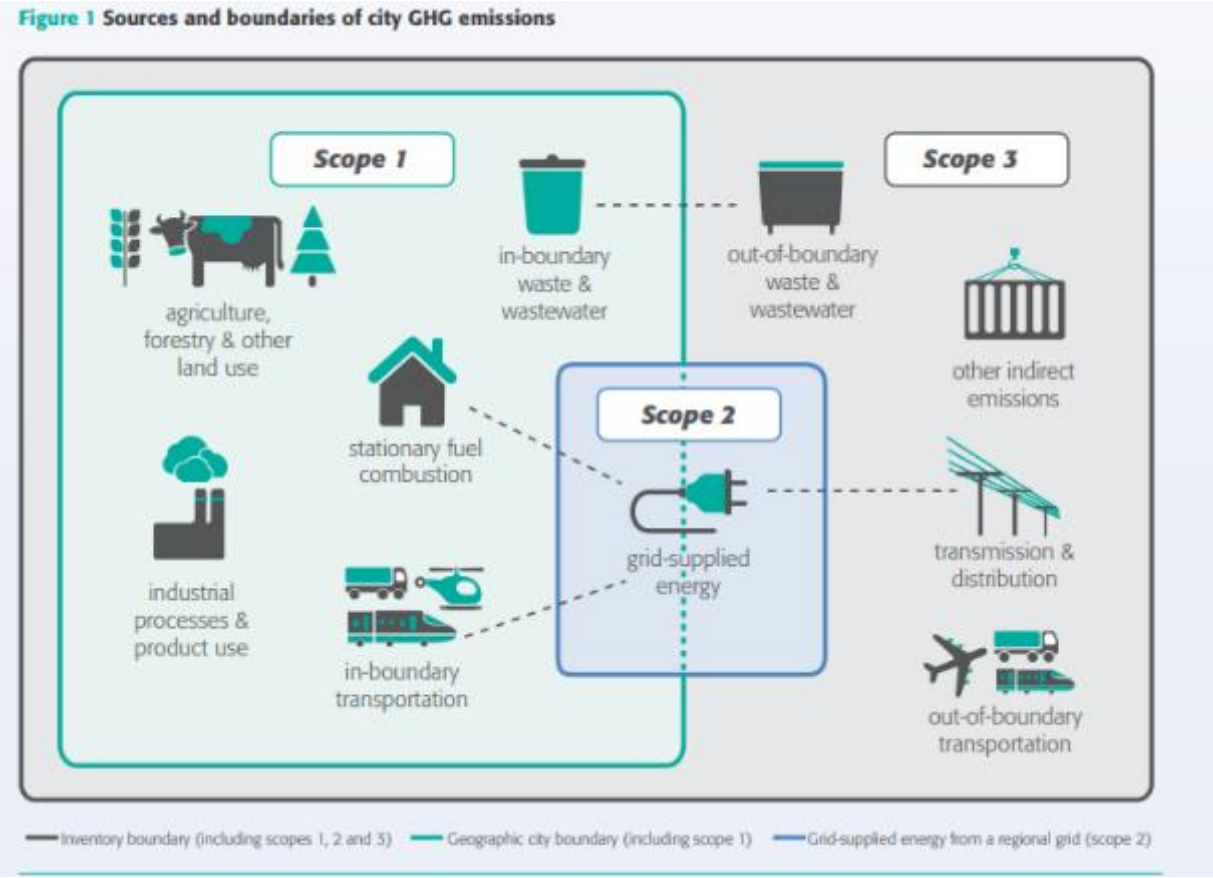
A2ZERO
EQUITABLE - SUSTAINABLE - TRANSFORMATIVE

The Charge


SOLID WASTE 3%
MISC 3%
TRANSPORTATION 17%
UNIVERSITY OF MICHIGAN 32%
COMMERCIAL/ INDUSTRIAL 22%
RESIDENTIAL 23%
2018 EMISSIONS SNAPSHOT
2.1 million metric tons
Our 2018 greenhouse gas emissions inventory is our starting point as we race to zero emissions by 2030.


2018 Emissions by Source
3%
17%
52%
28%
Electricity
Natural Gas
Transportation
Solid Waste

The Charge



What's not included in calculations

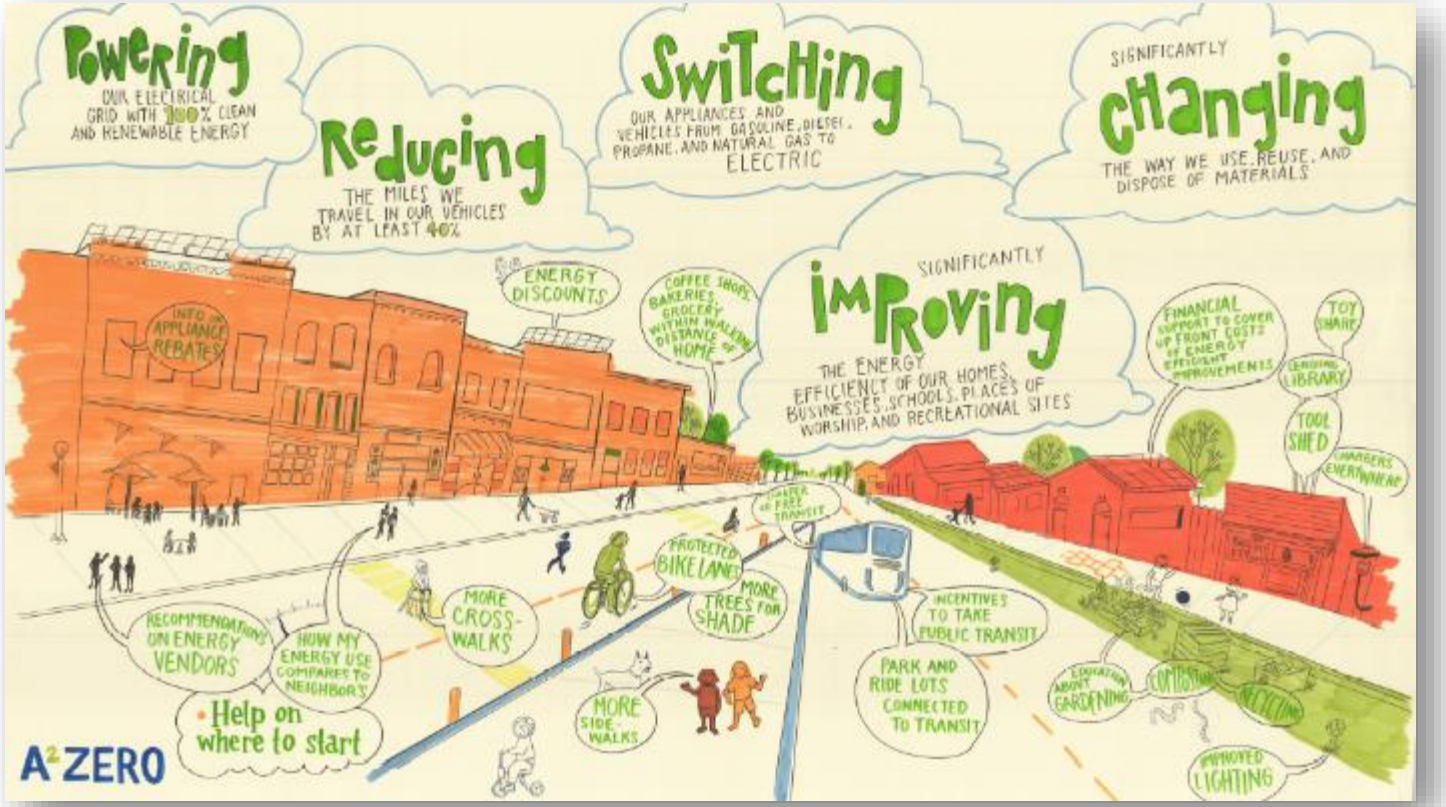
- Embedded Emissions
- Upstream and downstream
- Full range of the commute
- Travel by residents
- Agriculture, forestry, and other land use

A²Zero Mission

Deliver exceptional services that sustain and enhance a vibrant, safe and diverse community.

A²Zero Vision

Together, creating and implementing a just transition to carbon neutrality by the year 2030.



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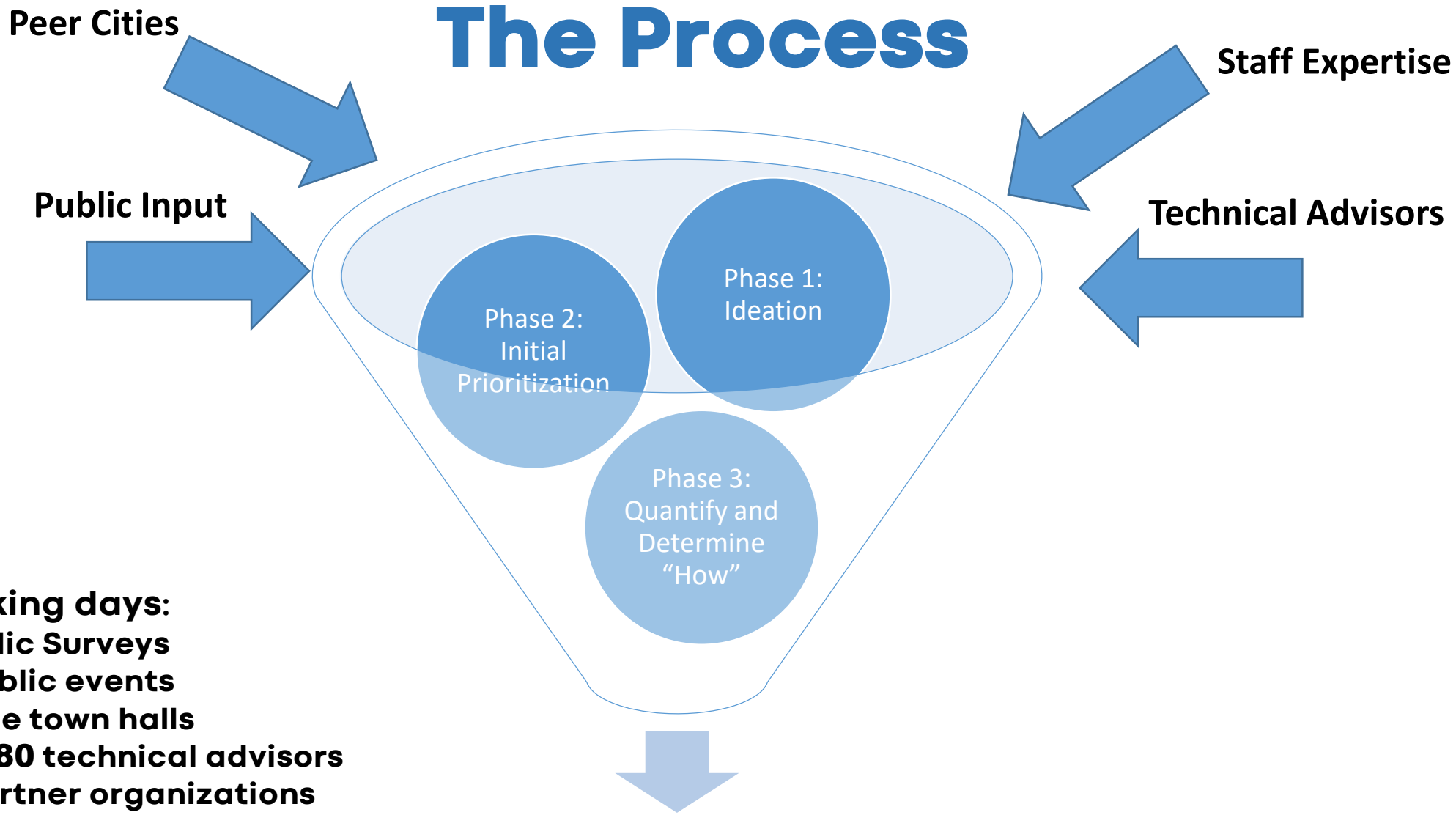
The Process

The Process



82 working days:

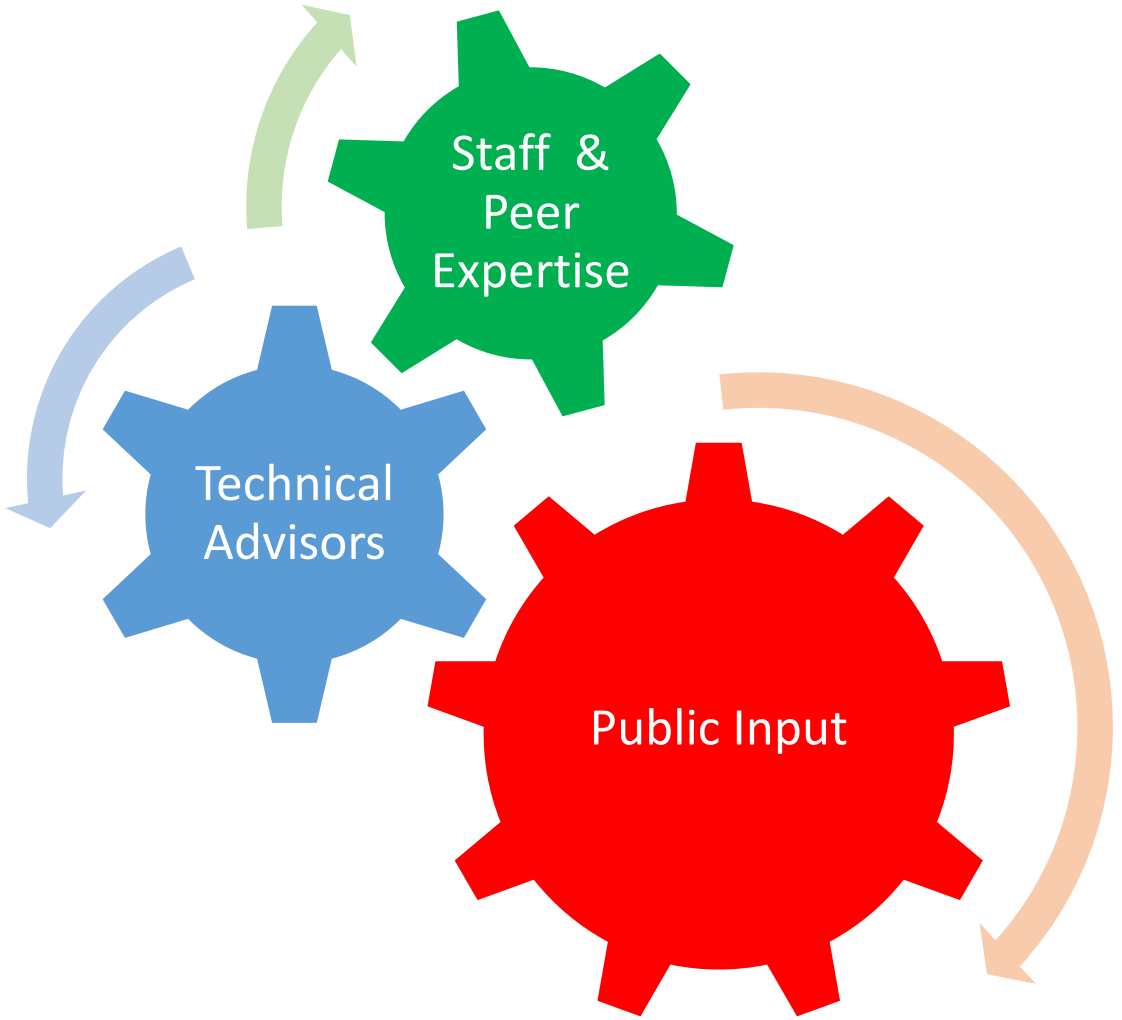
- **3** Public Surveys
- **68** public events
- **2** large town halls
- Over **80** technical advisors
- **66** partner organizations

FINAL PLAN

The Process

Process was iterative

Plan is living



The Strategy

What do we propose to do?

GETTING TO ZERO: The Big Picture

- Powering our electrical grid with **100%** clean and renewable energy
- Switching our appliances and vehicles from gasoline, diesel, propane, and natural gas to electric
- Significantly improving the energy efficiency in our homes, businesses, schools, places of worship, and recreational sites
- Reduce the miles we travel in our vehicles by at least **50%**
- Significantly change the way we use, reuse, and dispose of materials
- Enhance the resilience of our people and place
- Other

Powering Our Electrical Grid with 100% Renewables: Community Choice Aggregation

STRATEGY 1: Powering Our Electrical Grid with 100% Renewable Energy

1. COMMUNITY CHOICE AGGREGATION

Community Choice Aggregation (CCA) are programs that allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while receiving transmission and distribution services from their existing utility providers. CCA allows communities to have more control over the production of their energy, including integrating community values such as 100% renewable energy into their purchasing decisions. Generally, a CCA is an opt-out program meaning that it allows economies of scale to be achieved which leads to close to or actual cost parity to existing electricity costs. In order to implement a CCA, we will need state enabling legislation.

Vision for Community Choice Aggregation

Community Choice Aggregation legislation has been enabled by the State and Ann Arbor administers its first bulk buy of 100% new renewable energy by 2027. Through an opt-out structure and little change in energy rates, all residents and commercial entities, including the University of Michigan, participate.

Party Responsible for Implementation

City of Ann Arbor's Office of Sustainability and Innovations

Collaborators / Project Co-Designers

City of Ann Arbor's Office of Sustainability and Innovations

- State legislature
- Other Michigan municipalities
- Michigan Municipal Association on Utility Issues (MI-MAUI)

Assumptions of the CCA Program

- 100% of residential customers participate in the CCA
- 100% of commercial and industrial enterprises participate in the CCA
- 100% of any municipal operations not yet powered by renewable energy are included in the CCA
- Capacity of program accounts for changes in consumption due to (a) reductions in consumption achieved through widespread energy efficiency improvements, (b) increases in consumption related to switching from fossil fuel powered heating and vehicles to renewable energy, and (c) projected growth rates
- Renewable energy credits from the sources procured through the program are retired, and the energy sources offset fossil fuel generation

Equity Impacts

CCA provides clean, renewable energy for the whole community. Many of Ann Arbor's low-income residents are renters which limits their ability to install renewable energy projects, such as solar. A CCA program would provide renewable energy to many of those who could not otherwise access this resource.

Indicators of Success / Goals

By 2030, 100% of our community's electrical needs are met with renewable energy sources, thanks in large-part to the CCA.

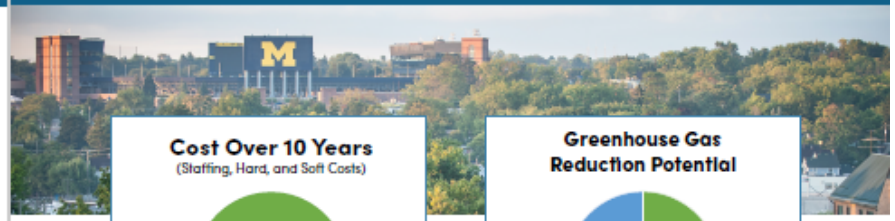
Target Demographic

Entire community

Timeline and Initial Actions

2020	2021	2024	2025	2026	2027
The City begins working on recommendations for what to include in a CCA program.	City begins working with legislators to develop CCA legislation. Public education begins about CCA.	The City begins planning the startup of the CCA program, undertaking feasibility studies, public engagement, and business model planning.	CCA is enabled in Michigan through the passing of state legislation	Ann Arbor public vote to allow a local CCA purchase.	CCA program launches in Ann Arbor and continues

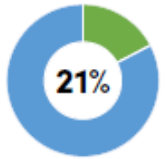
STRATEGY 1: Powering Our Electrical Grid with 100% Renewable Energy



Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$3,245,000

Greenhouse Gas Reduction Potential

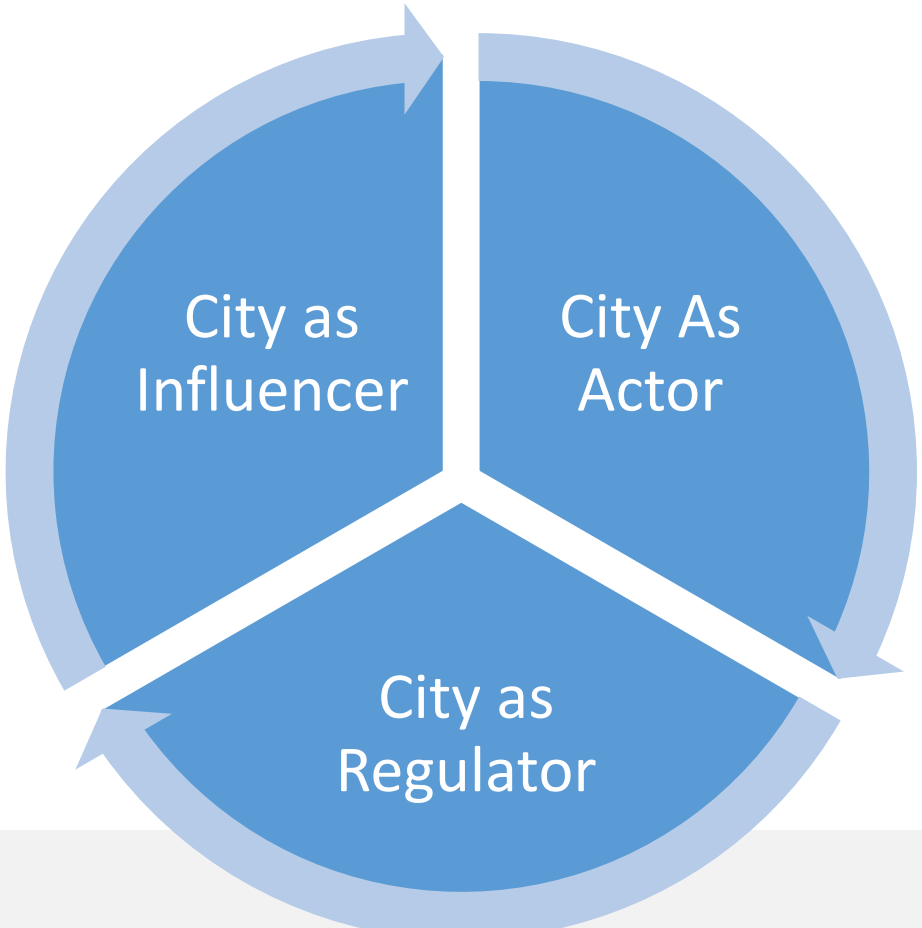


462,100 metric tons carbon dioxide equivalent (21% community-wide emissions).

If the University of Michigan participants, an additional 321,900 metric tons carbon dioxide equivalent could be reduced, resulting in a total of 784,000 metric tons carbon dioxide equivalent (36% community wide emissions).

COMING SOON

Plan by Ability to Influence



City as Actor

City as Actor
Actions the City can take on its own
Landfill Solar Project
Electrify City Fleet
Expansion of Electric Charging Infrastructure
LED Powered Streetlights and Traffic Signals
Net Zero Energy Affordable Housing
Expansion of Composting Program
Preserve and Enhance the Local Tree Canopy
Internal Carbon Price

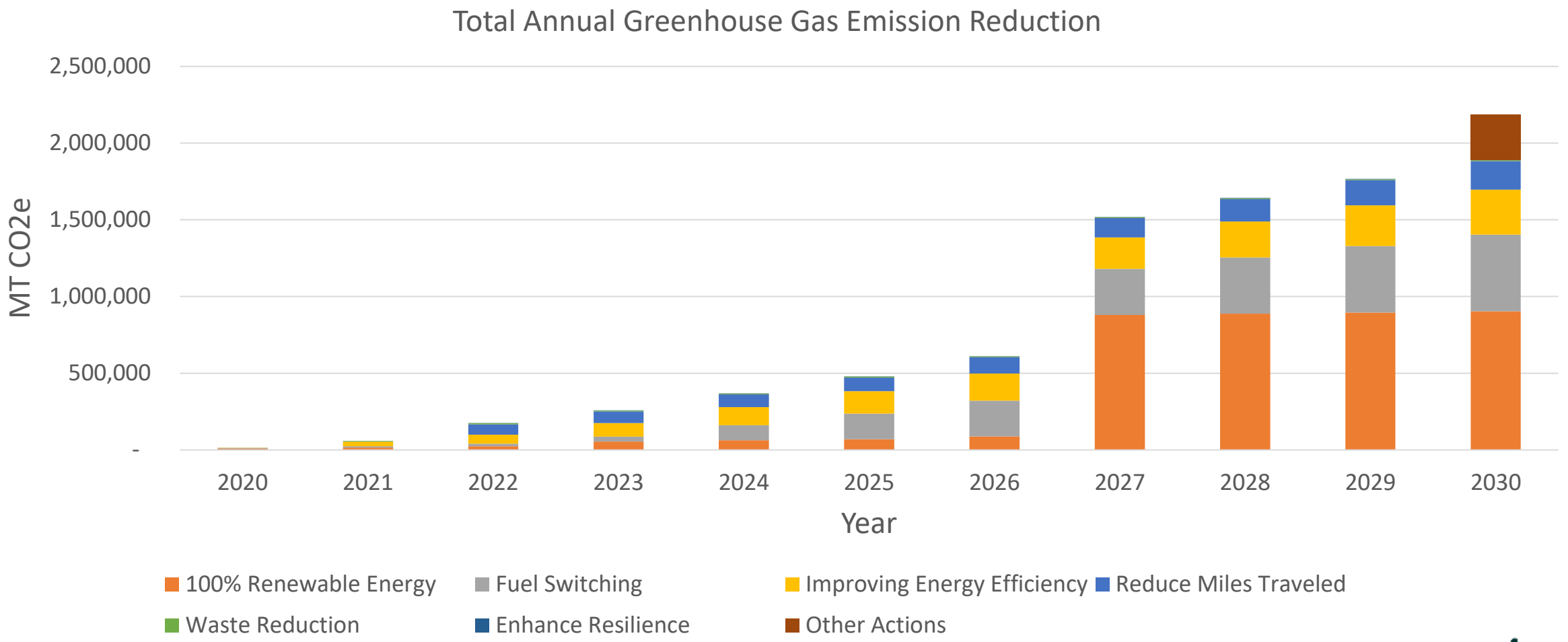
City as Regulator

City as Regulator
Actions that involve updating or new regulations from the City
Update Building Codes
Energy Disclosure / Benchmarking
Green Rental Housing Program
Increase the Diversity of Housing Allowed by Right
Mixed-Use Neighborhoods
Require Sustainable Materials in New and Existing Developments
Expansion of Commercial Recycling

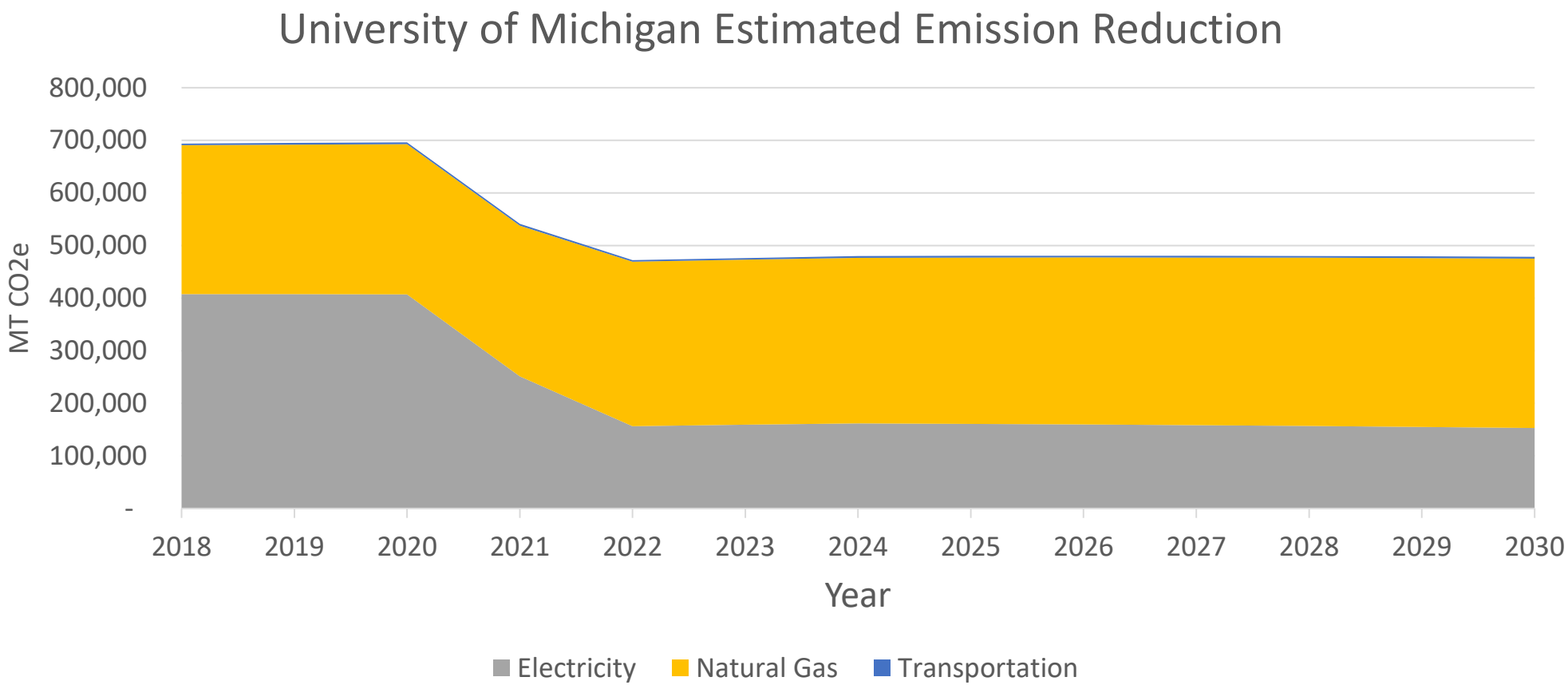
City as Influencer

City as Influencer *Actions that other entities need to take or enable*		
Community Choice Aggregation	Expand and Improve Regional Transit	Green Business Challenge
Onsite Renewables and Battery Storage	Increase Number of Park and Rides and Ensure Seamless Connection to Transit	Aging in Place Efficiently
Community Solar Program	Move Toward a Circular Economy	Expansion of Weatherization Program
Home and Business Electrification Policies and Support	Support a Plant Rich Diet	Implement Non-Motorized Transportation Plan
Electrify Buses	Enhance Refrigerant Recycling and Reuse Program	Expand and Improve Local Transit
Support Community Electric Vehicle and Solar Bulk Buys	Invest in Resilience Hubs	Equity Programs
Electrify Private Fleets	Foster Neighborhood and Youth Ambassadors Program	Sustaining Ann Arbor Together Grant Program
Support Transition to More Energy Efficient Homes and Businesses	Conduct Asset and Needs Mapping of Neighborhoods	Greenhouse Gas Emission Offsets
Loan Loss Reserve	Assist in Assembling and Disseminating Emergency Preparedness Kits	Tiered Parking Rates
Energy Concierge and Community Education	Implement Sensors to Monitor Heat, Air Quality, Waterways, and Flooding	

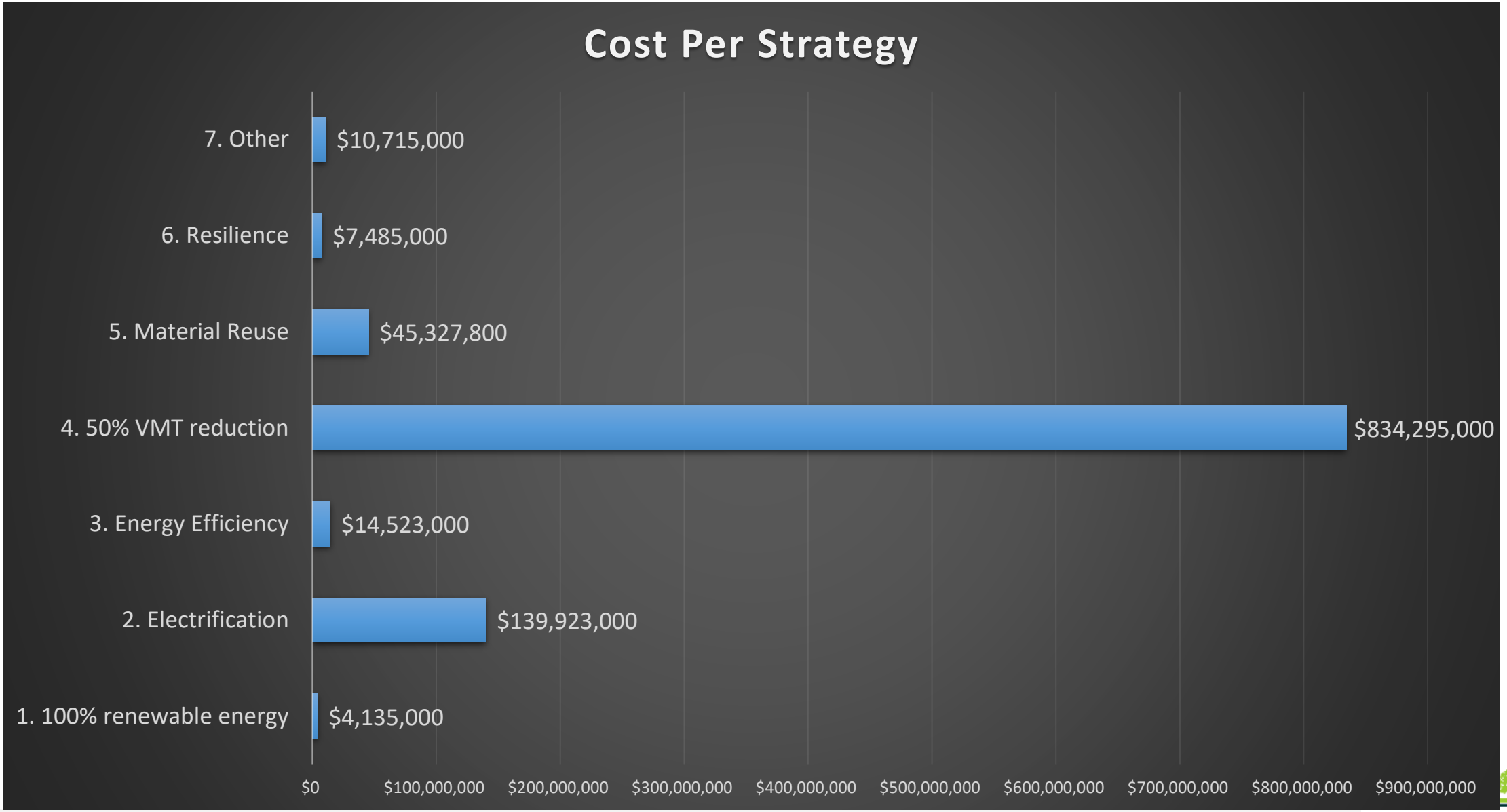
SUMMARY


Total Annual Greenhouse Gas Emission Reduction
MT CO2e
2,500,000
2,000,000
1,500,000
1,000,000
500,000
-
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Year
100% Renewable Energy
Fuel Switching
Improving Energy Efficiency
Reduce Miles Traveled
Waste Reduction
Enhance Resilience
Other Actions

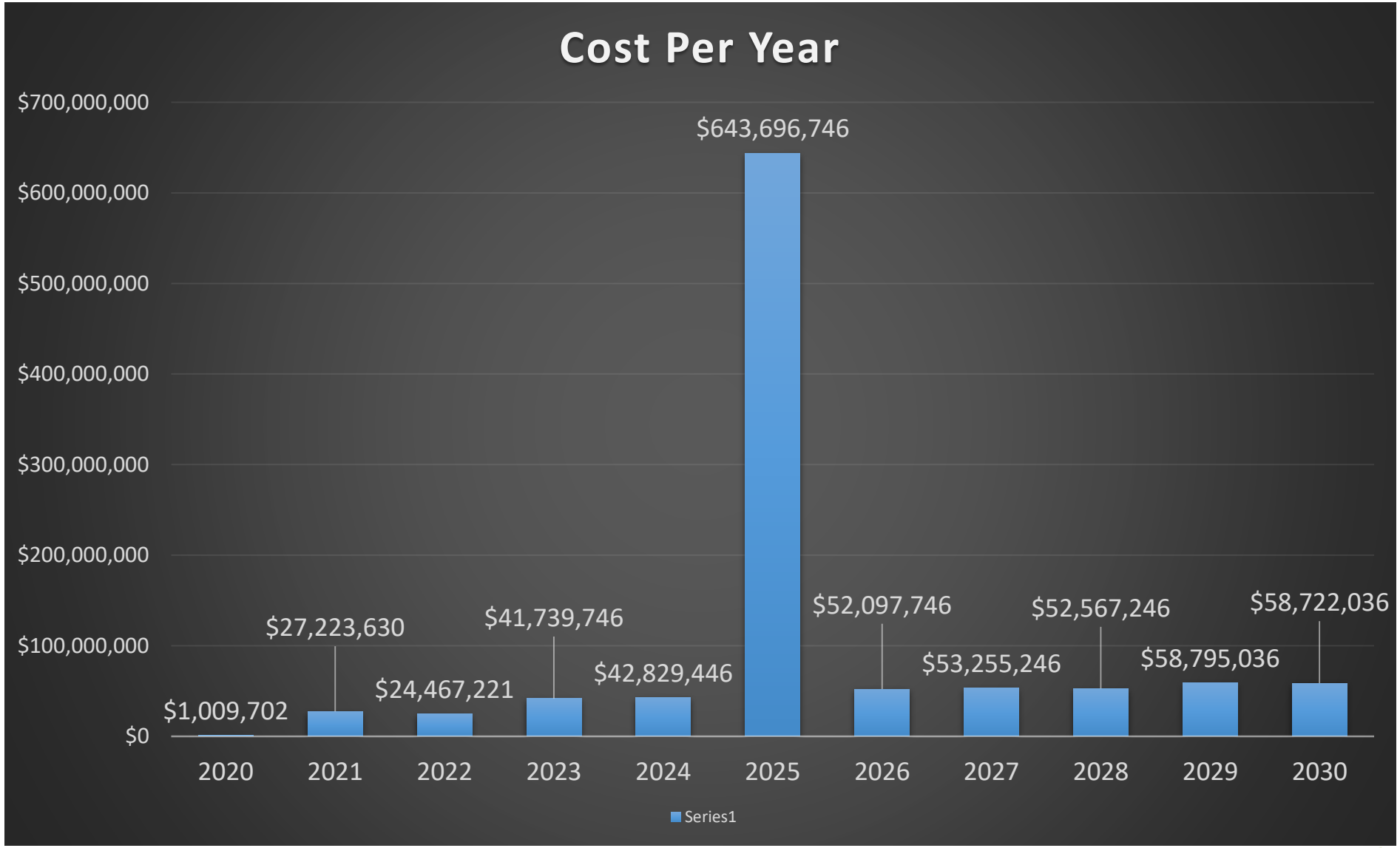
CAVEAT


University of Michigan Estimated Emission Reduction
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
-
MT CO2e
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Year
Electricity
Natural Gas
Transportation

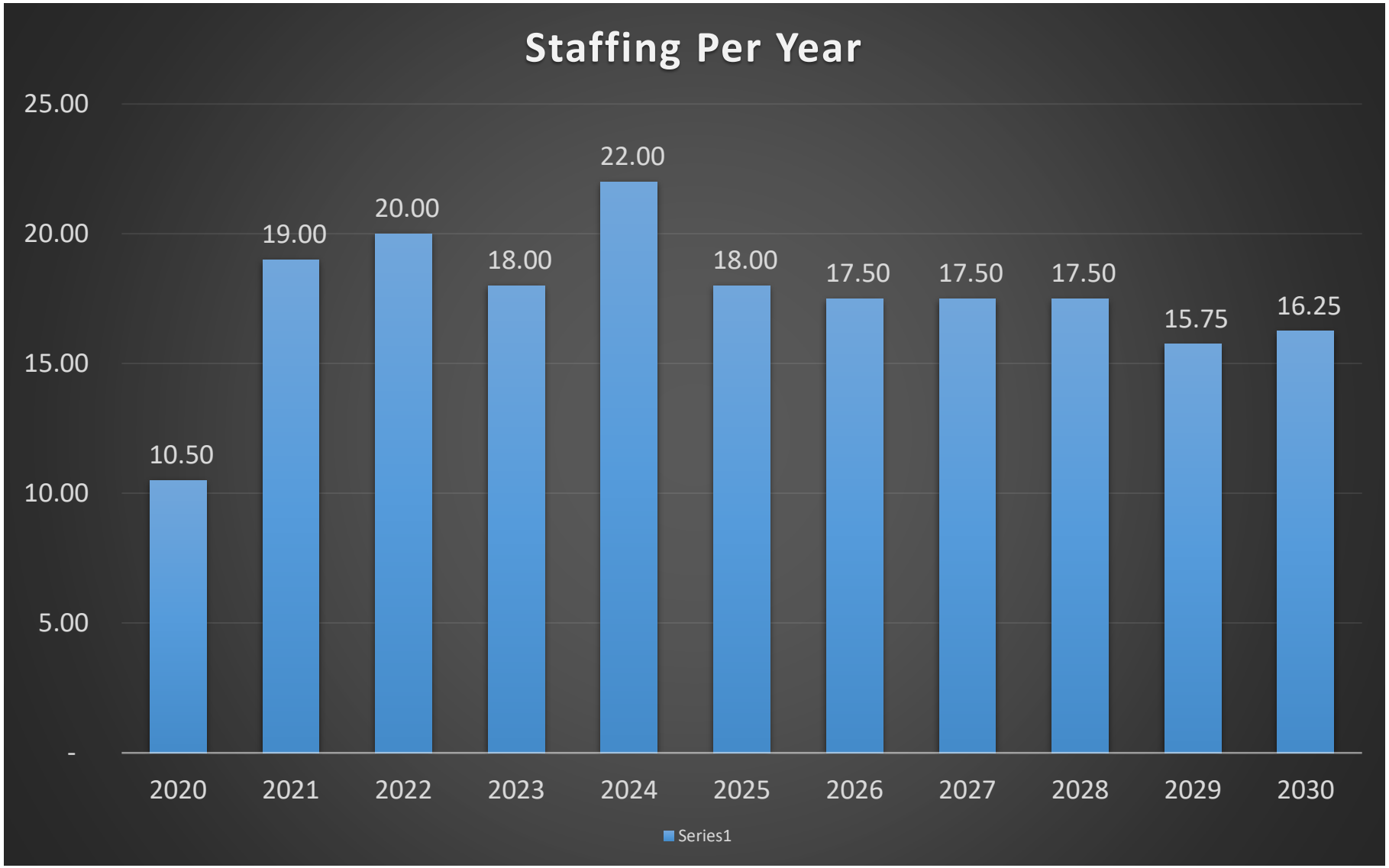
SUMMARY


Cost Per Strategy
7. Other
$10,715,000
6. Resilience
$7,485,000
5. Material Reuse
$45,327,800
4. 50% VMT reduction
$834,295,000
3. Energy Efficiency
$14,523,000
2. Electrification
$139,923,000
1. 100% renewable energy
$4,135,000
$0
$100,000,000
$200,000,000
$300,000,000
$400,000,000
$500,000,000
$600,000,000
$700,000,000
$800,000,000
$900,000,000

SUMMARY


Cost Per Year
$700,000,000
$600,000,000
$500,000,000
$400,000,000
$300,000,000
$200,000,000
$100,000,000
$0
$1,009,702
$27,223,630
$24,467,221
$41,739,746
$42,829,446
$643,696,746
$52,097,746
$53,255,246
$52,567,246
$58,795,036
$58,722,036
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Series1

Staffing


Staffing Per Year
25.00
20.00
15.00
10.00
5.00
-
10.50
19.00
20.00
18.00
22.00
18.00
17.50
17.50
17.50
15.75
16.25
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Series1

FY21 Budget

Impacts

- **$50,000** for renewable energy and efficiency work at city facilities
- **$47,500** for Lead for America Policy Fellow
- **$30,000** for part-time office manager - freeing up Manager's time to fundraise
- **$7,331** IT funds for Lead for America fellow's infrastructure
- **$50,000** for contractor to jump start solarize and energy efficiency bulk buys
- **$30,000** for general fund portion of internal carbon tax
- **$1,500** in city vehicle fees
- **3 new FTEs**

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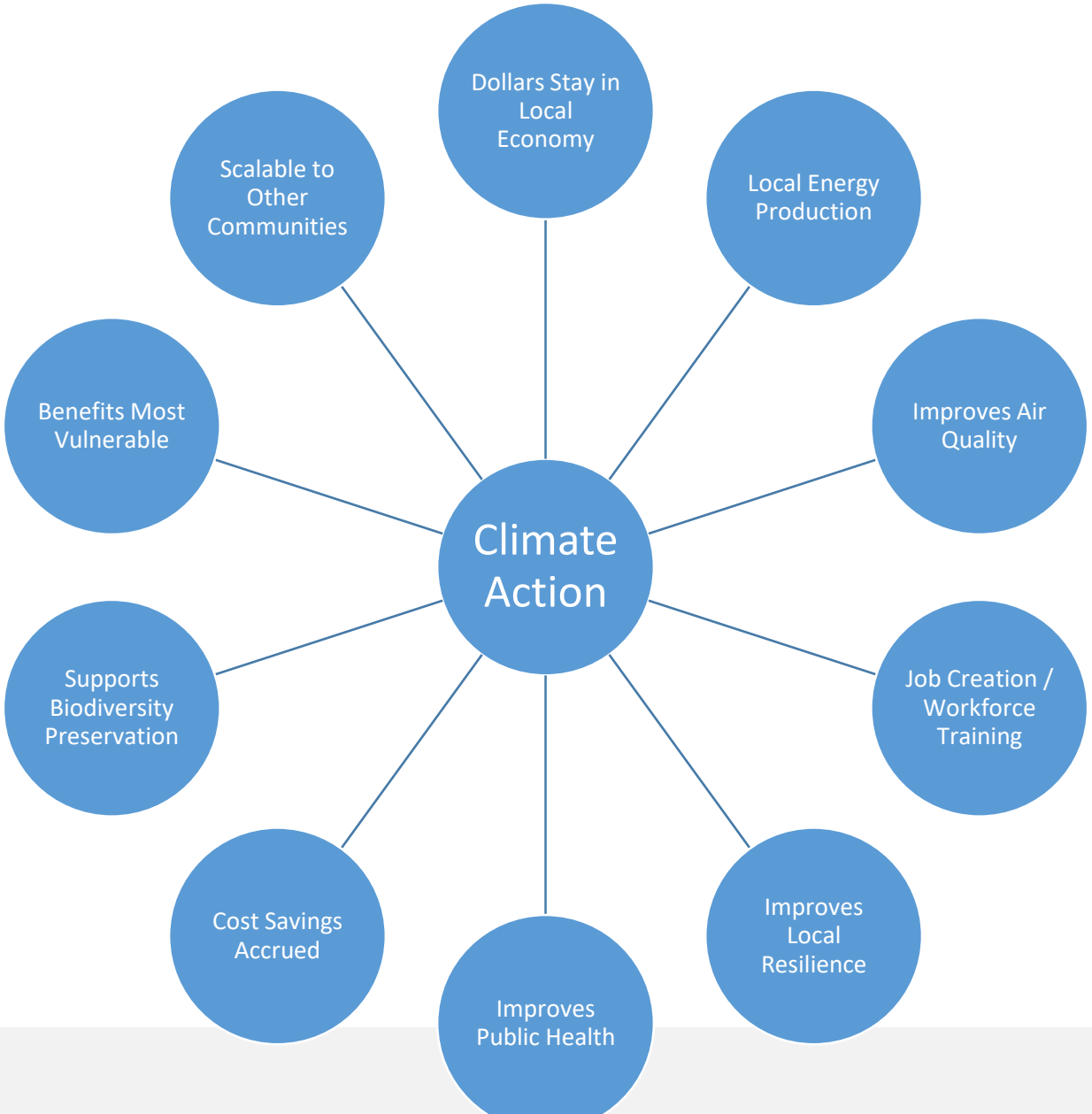
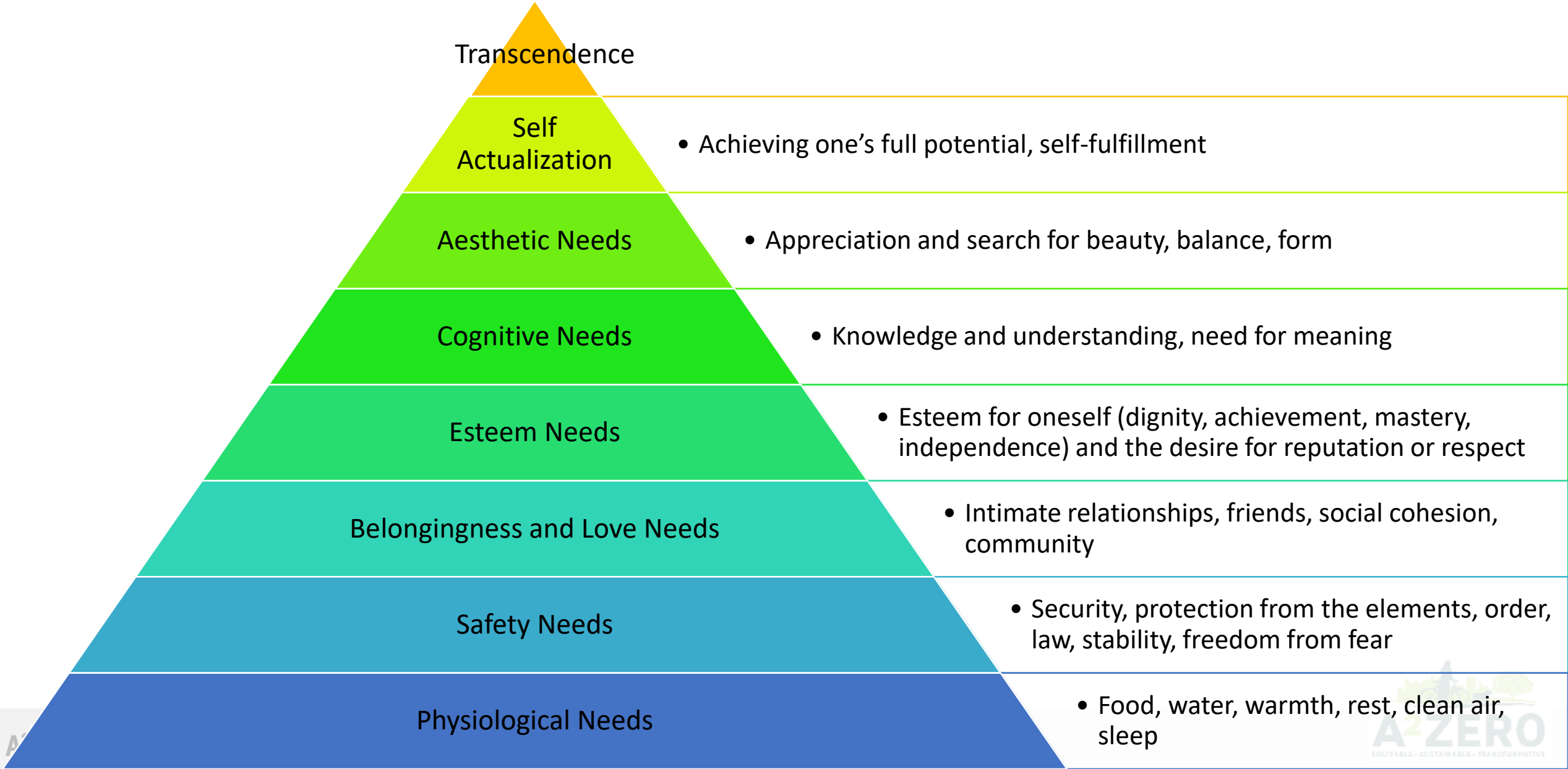
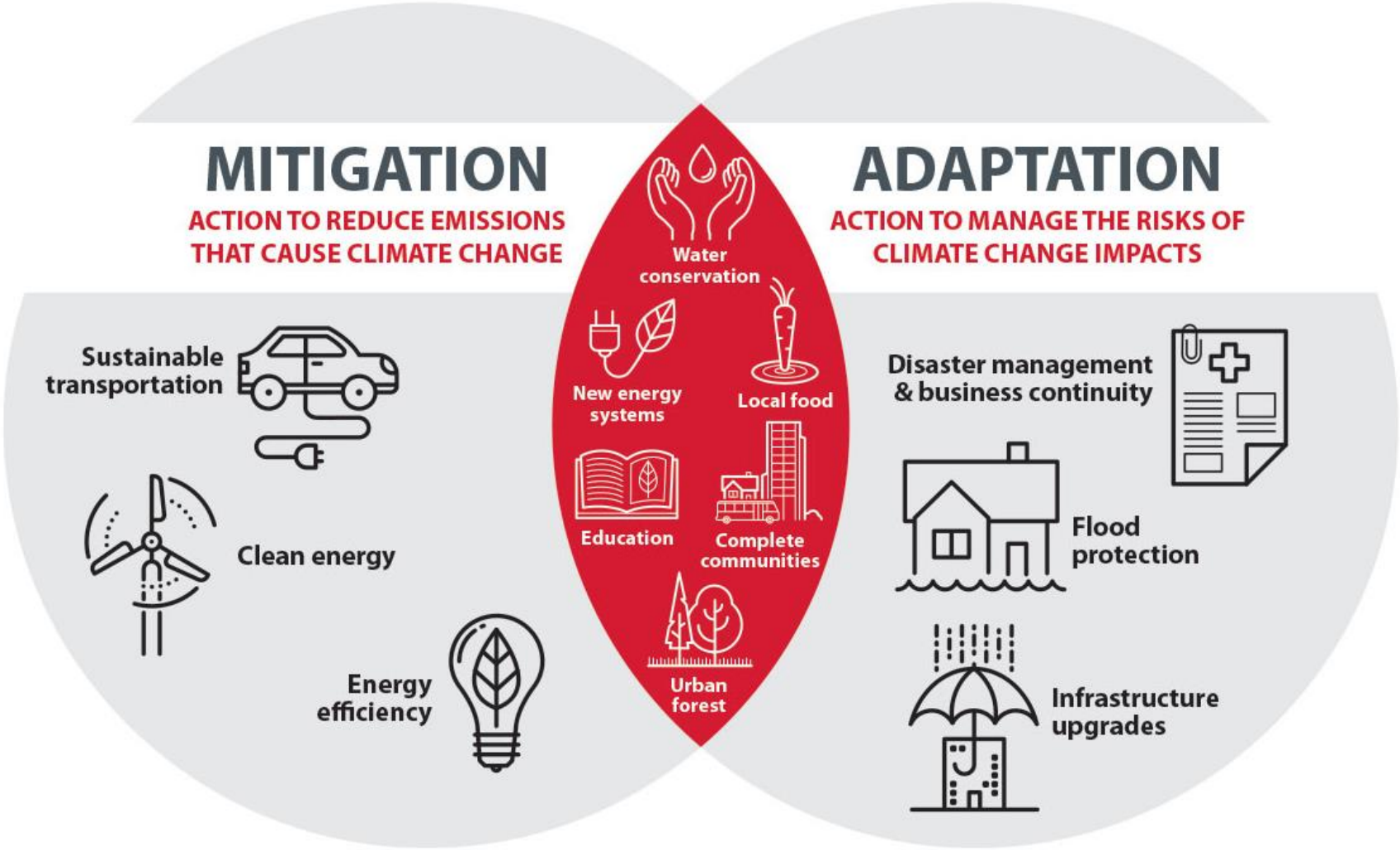
Co-Benefits


Climate Action
Dollars Stay in Local Economy
Local Energy Production
Improves Air Quality
Job Creation / Workforce Training
Improves Local Resilience
Improves Public Health
Cost Savings Accrued
Supports Biodiversity Preservation
Benefits Most Vulnerable
Scalable to Other Communities

Maslow's Hierarchy of Needs



Resilience


MITIGATION
ACTION TO REDUCE EMISSIONS THAT CAUSE CLIMATE CHANGE
ADAPTATION
ACTION TO MANAGE THE RISKS OF CLIMATE CHANGE IMPACTS
Water conservation
New energy systems
Local food
Education
Complete communities
Urban forest
Sustainable transportation
Clean energy
Energy efficiency
Disaster management & business continuity
Flood protection
Infrastructure upgrades

Thank You
&
Questions