

A²Zero Carbon Neutrality Plan & Office of Sustainability and Innovations FY21 Budget



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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

Goal 1: Declare a climate emergency and commit to taking action as a result of this declaration

Goal 2: Support a public engagement process, beginning immediately, that helps outline how the entire Ann Arbor Community could achieve carbon neutrality by the year 2030

Goal 3: 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

Goal 4: 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

Goal 5: Seek and facilitate collaboration with the University of Michigan and the PCCN to create and realize the 2030 Carbon Neutral Ann Arbor Plan

Goal 6: 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

Context

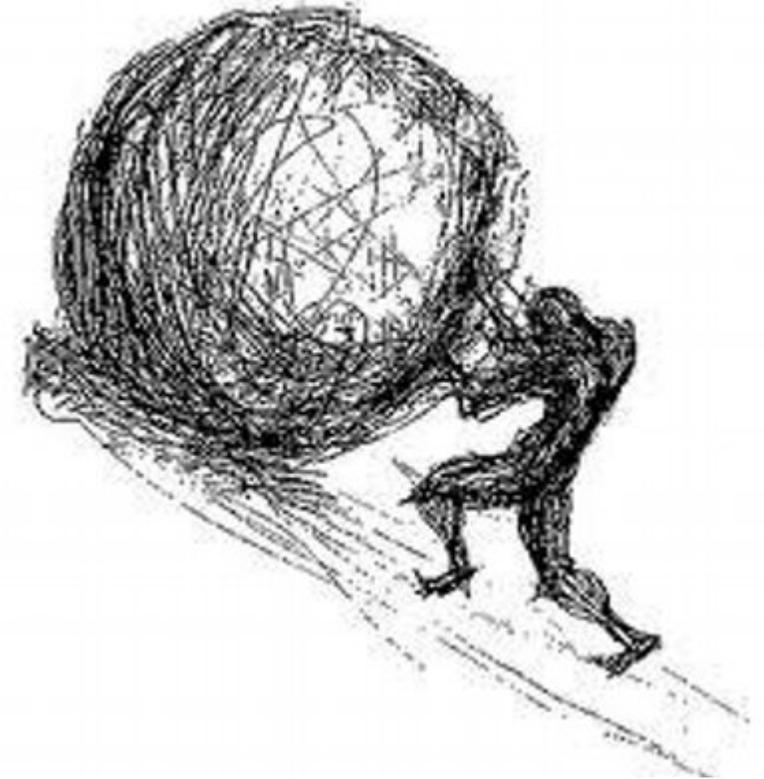
Achieving carbon neutrality will be hard

It will require funding

It will necessitate changes in land use

It will mean a prioritization of passive and active transit

It will mean changes in all of our lives and behaviors



Context

Achieving carbon neutrality will

Save lives

Increase quality of life

Change our relationship with our people and our place

Solidify our role as a national and international leader

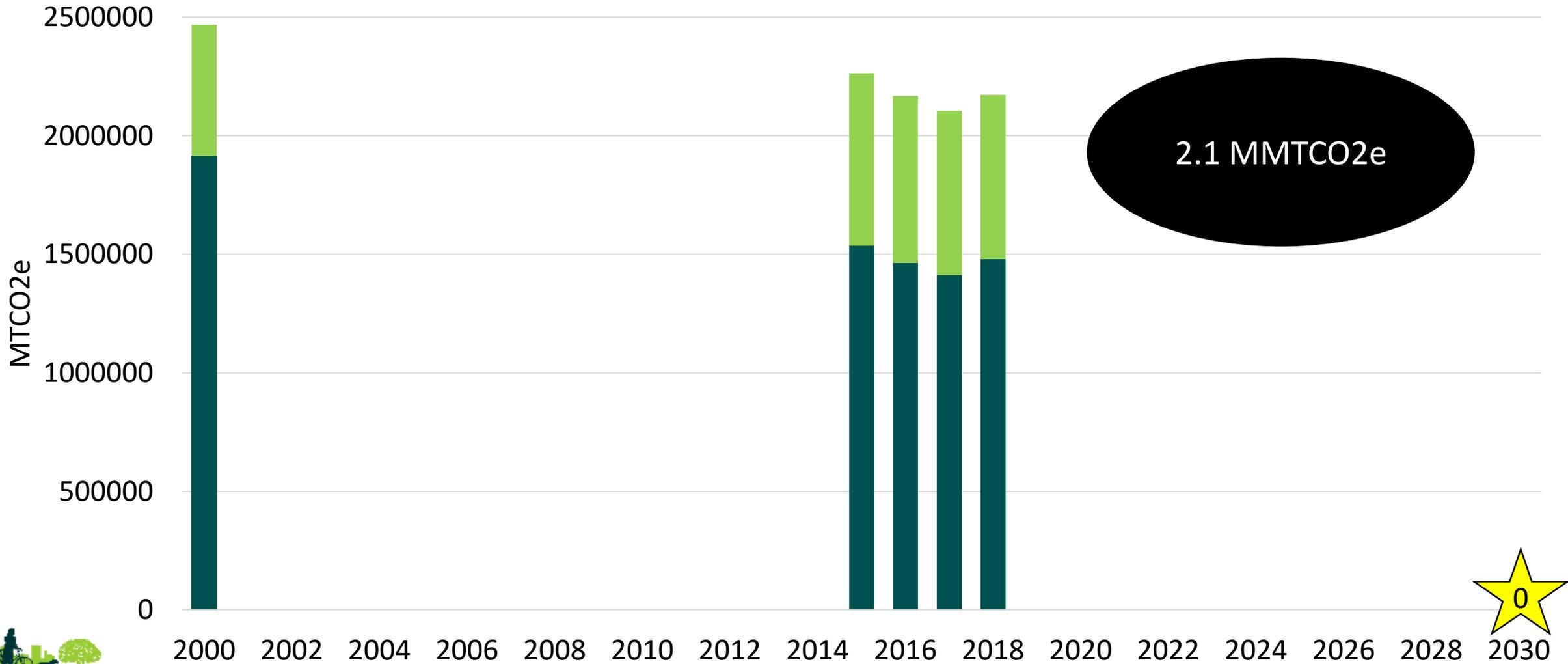
Stimulate new markets and opportunities



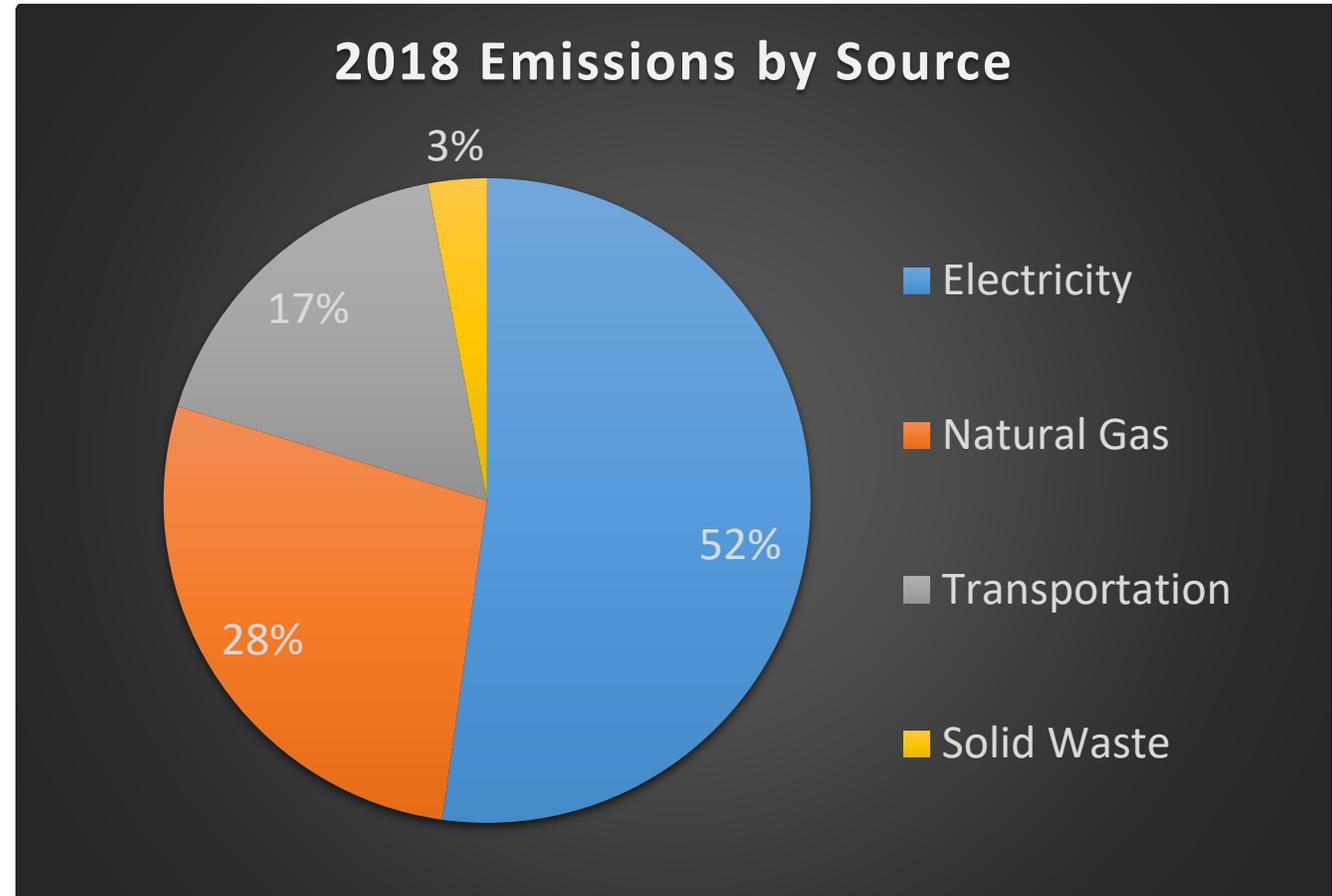
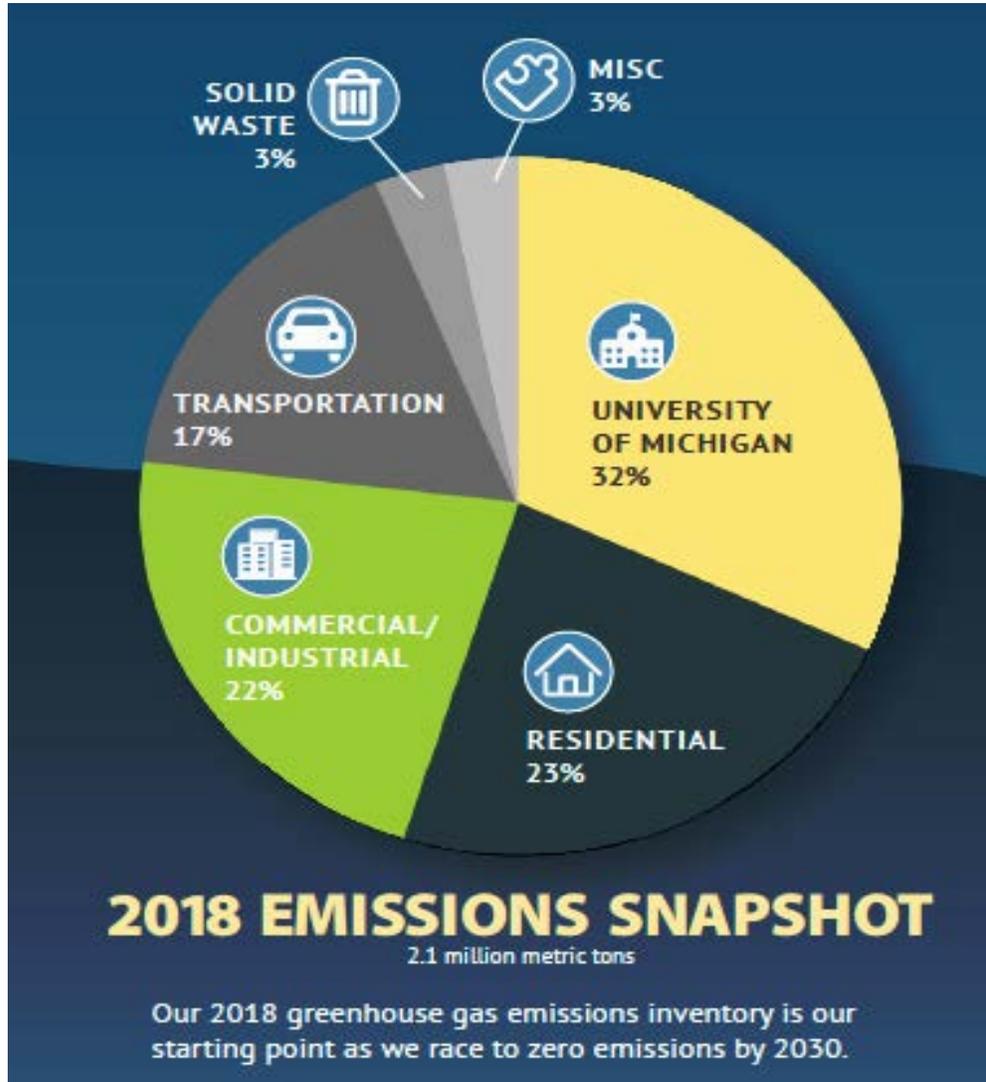
The Charge

The Charge

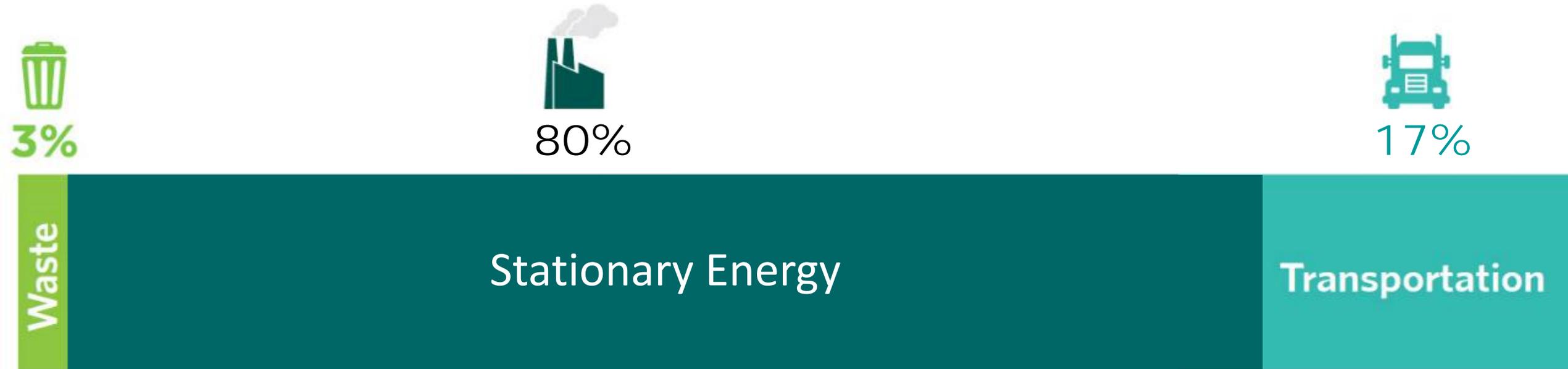
■ CITY ■ UM



The Charge



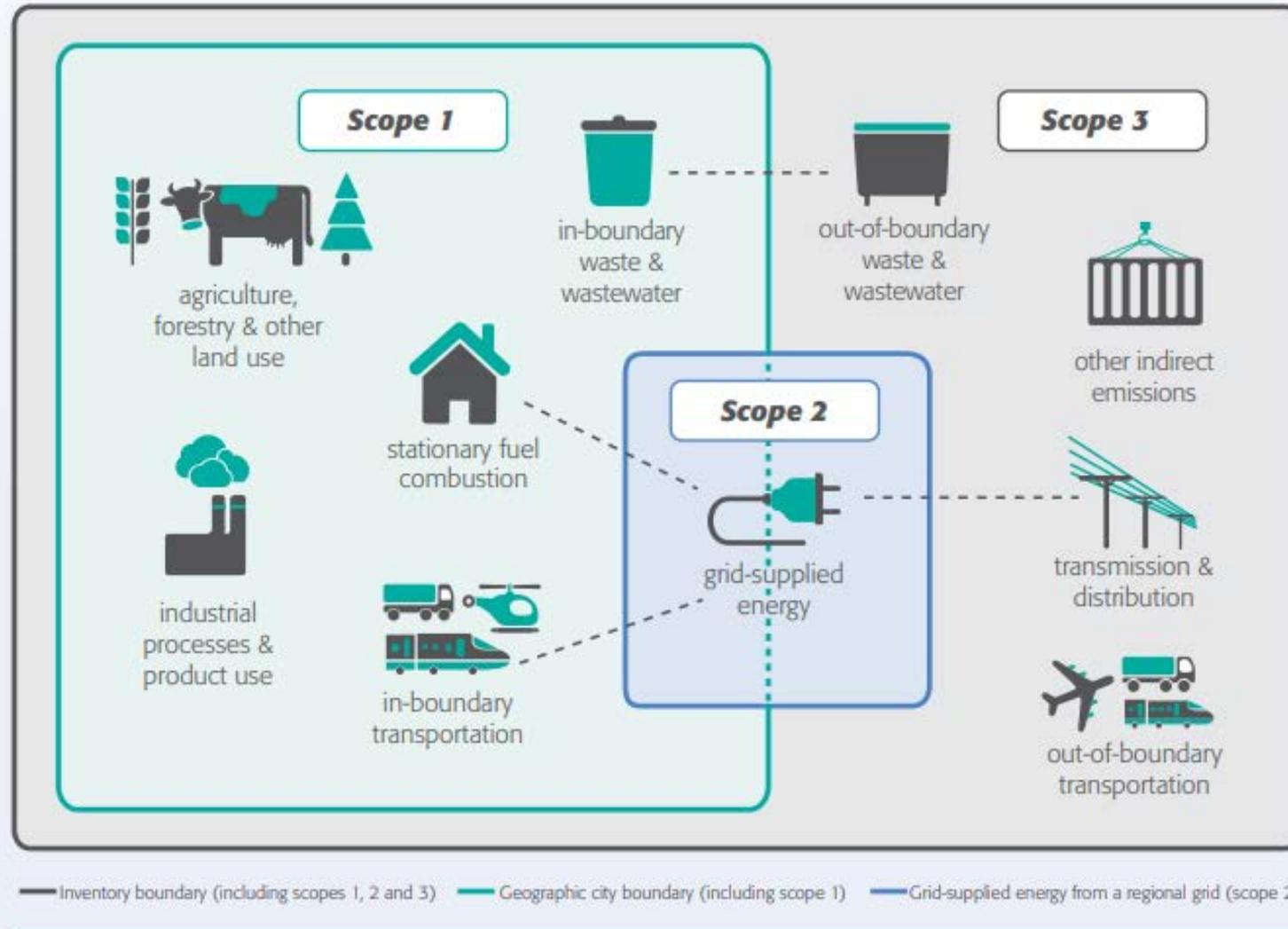
The Charge



2018 GHG Emissions by Sector

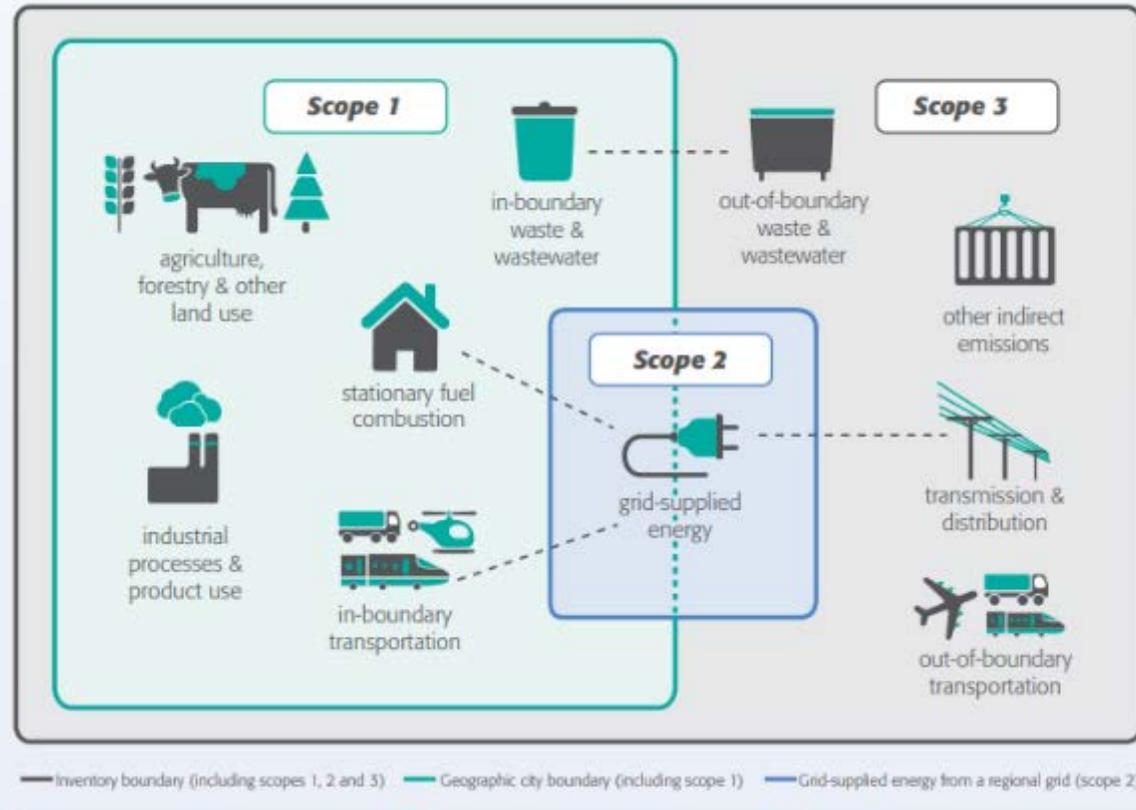
The Charge

Figure 1 Sources and boundaries of city GHG emissions



The Charge

Figure 1 Sources and boundaries of city GHG emissions



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

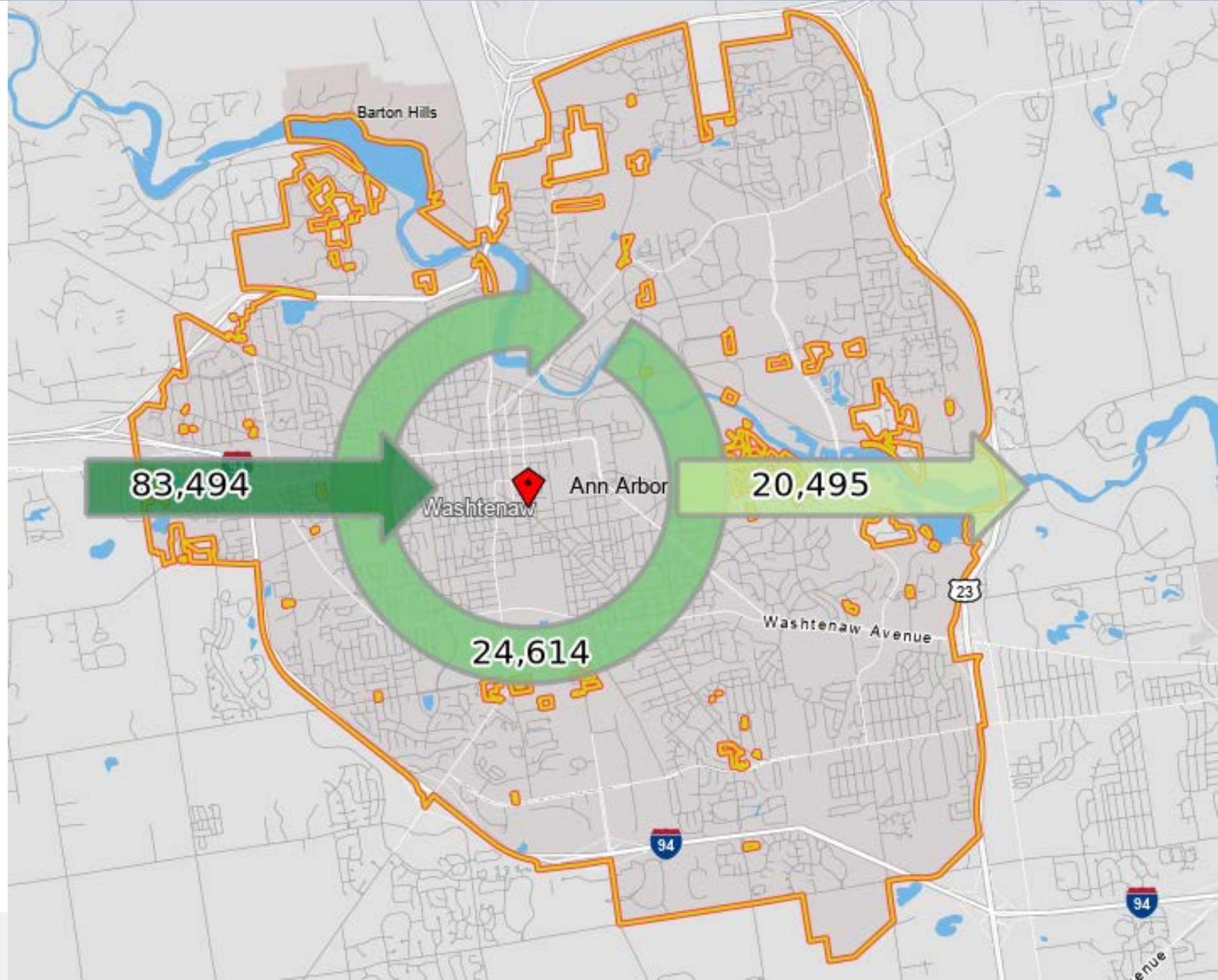
Commuting Patterns

83,494 commute in for jobs

24,614 live and work in Ann Arbor

20,495 commute out for jobs

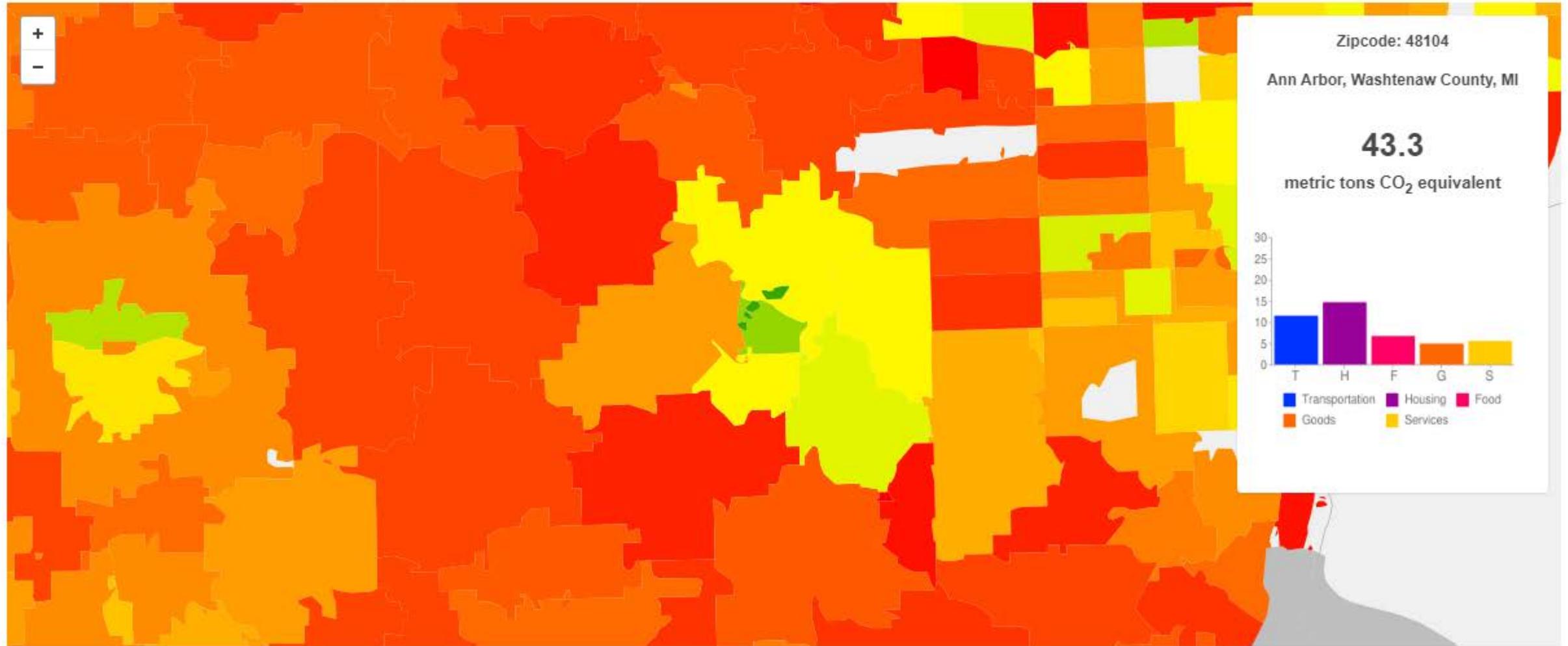
Source: On the Map
2017



Average Annual Household Carbon Footprint by Zip Code

The Charge

Double click to zoom or drag map to any location. Hover for details.



The Framing

The Values



Equitable

- Transparent
- Community-Led
- Inclusive



Sustainable

- Living / Iterative
- Holistic
- 3 E's



Transformative

- Okay to Fail
- Diversified
- Prioritizes Frontline Populations

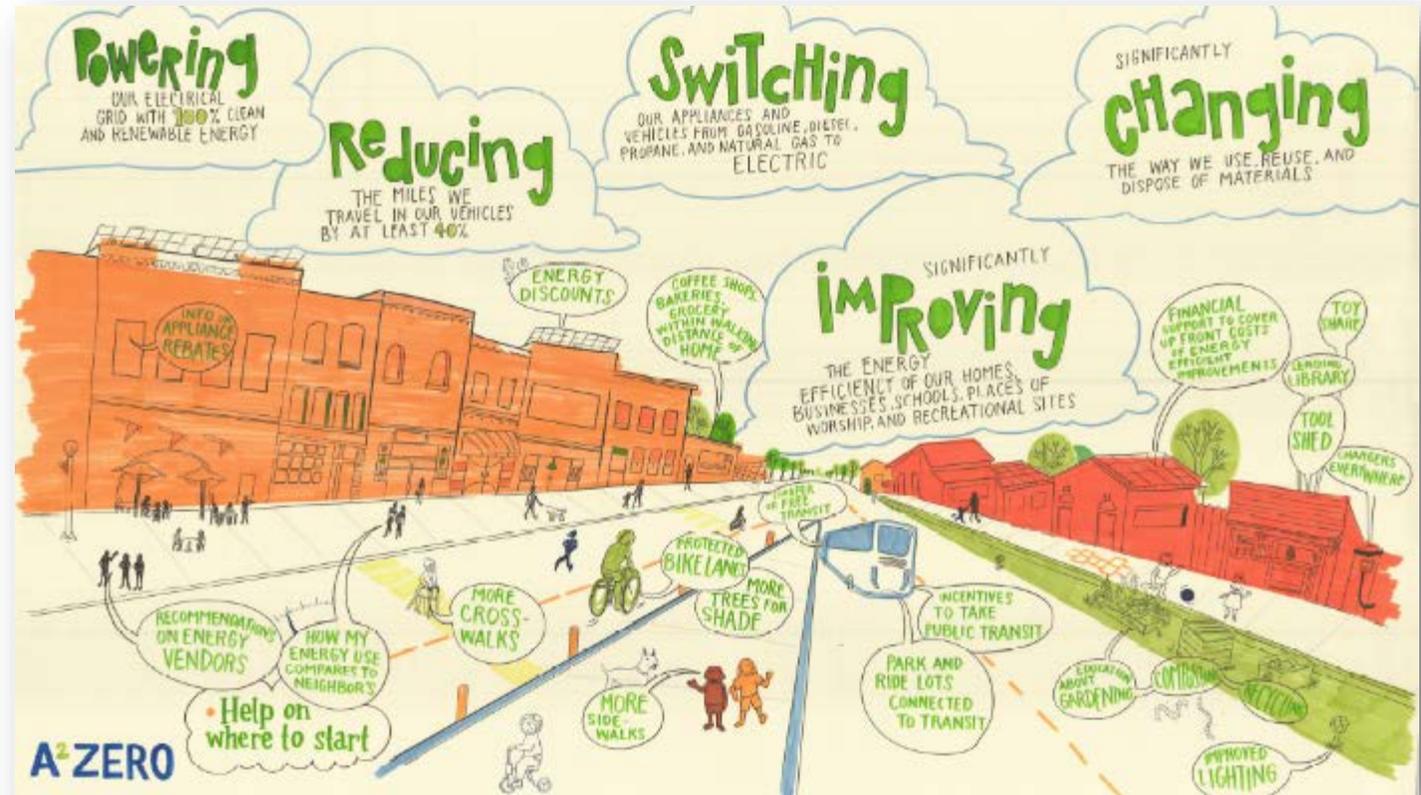
A²Zero Mission

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



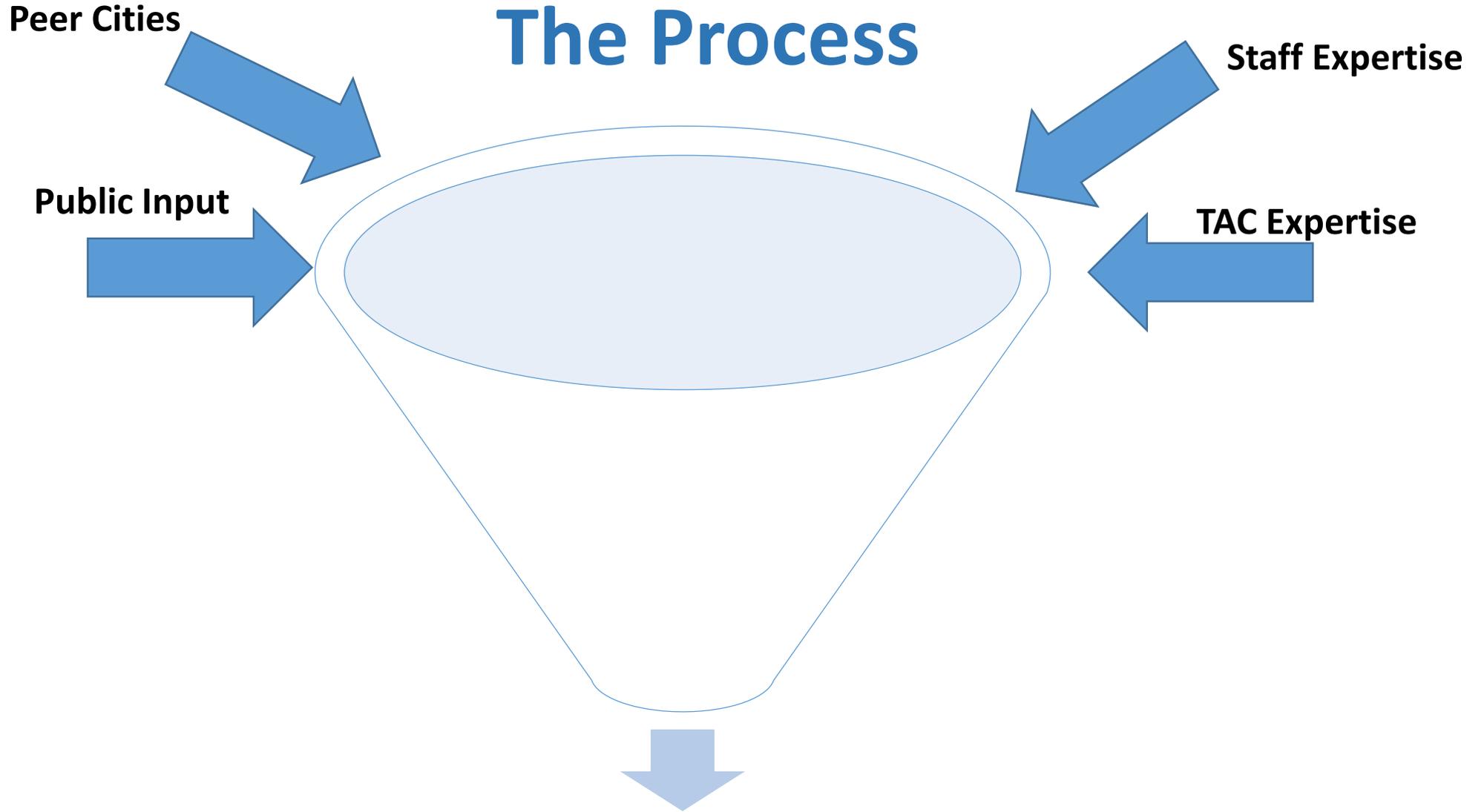
A²Zero Vision

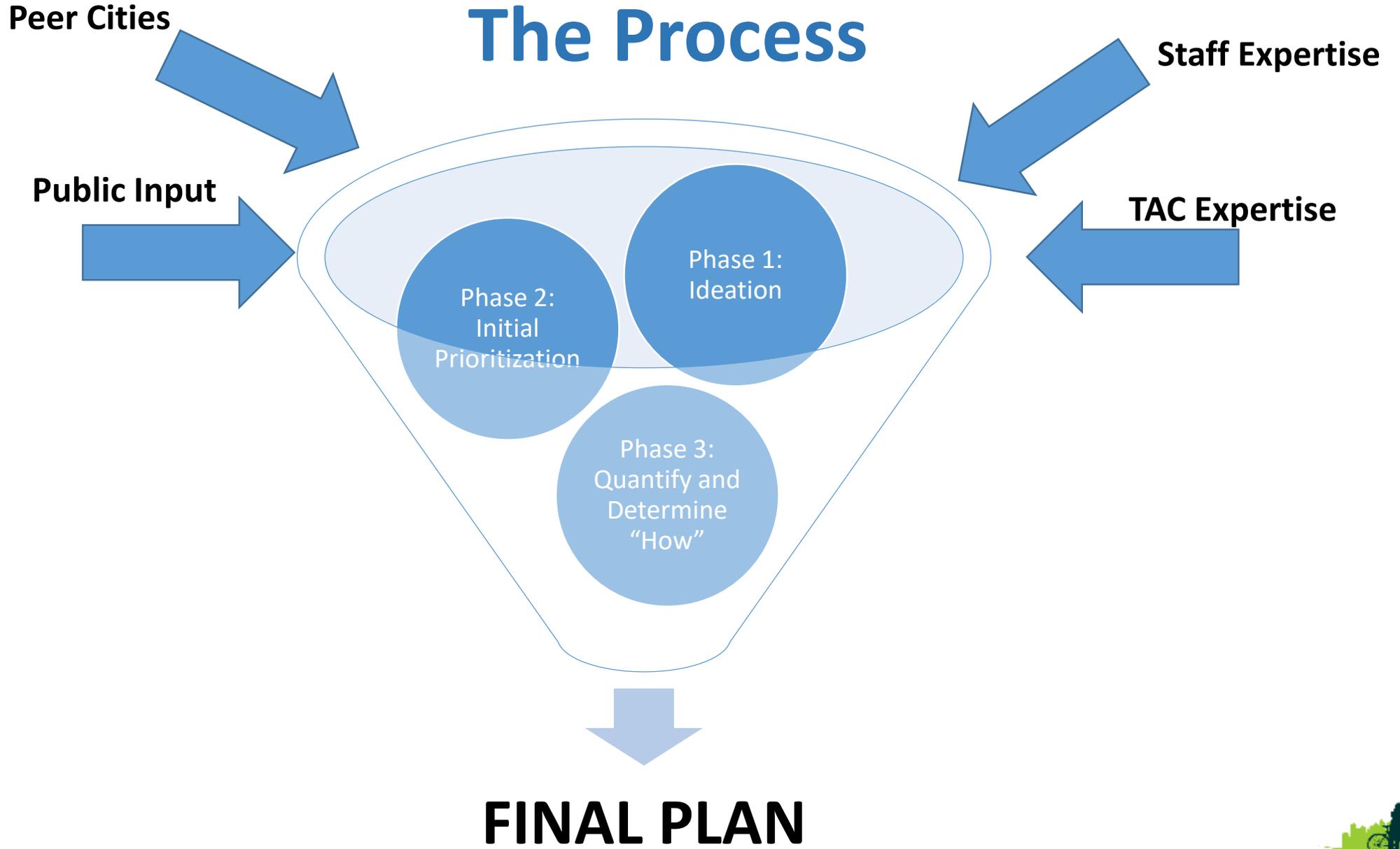
Together, creating and implementing a just transition to carbon neutrality by the year 2030.

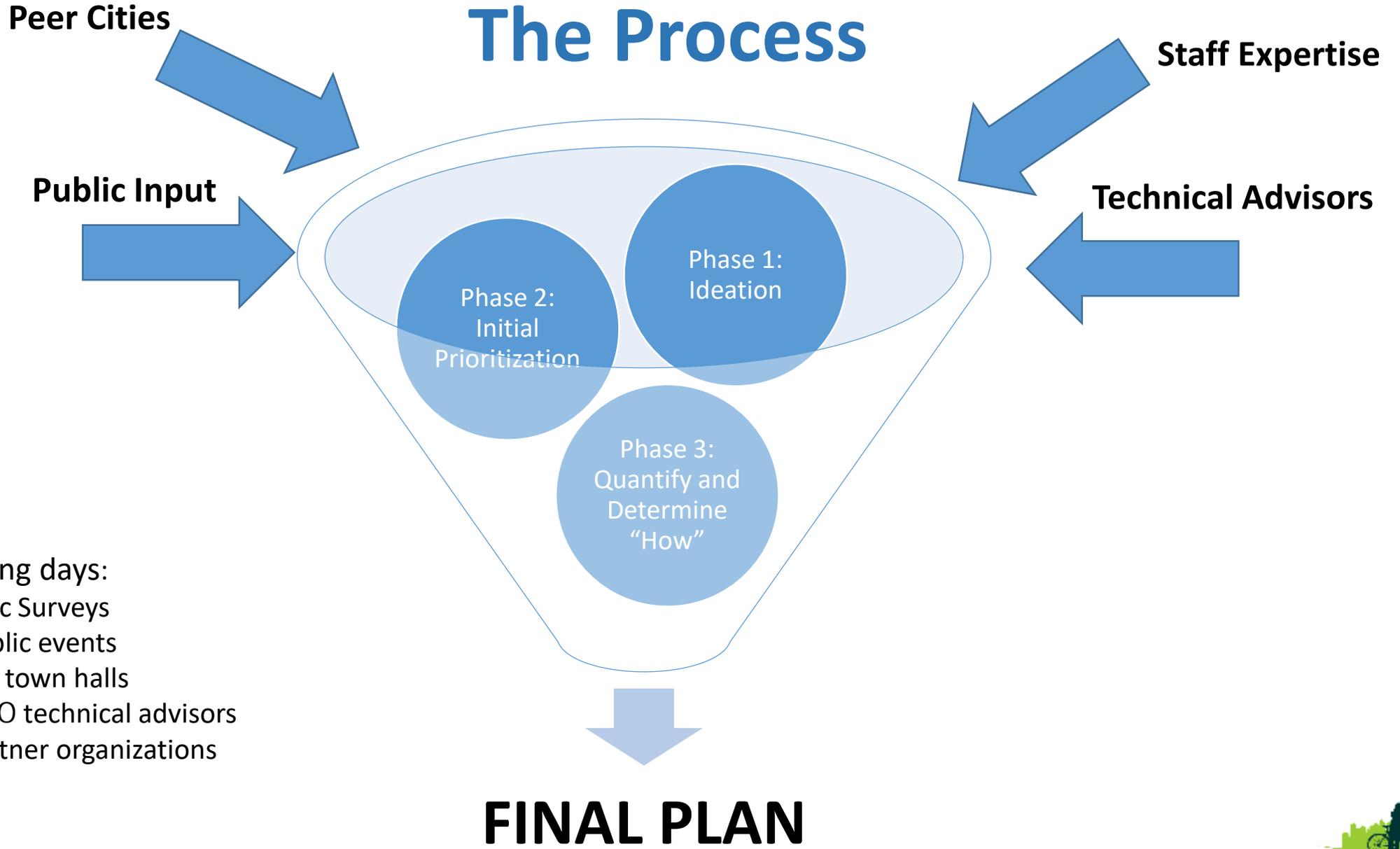


The Process

The Process



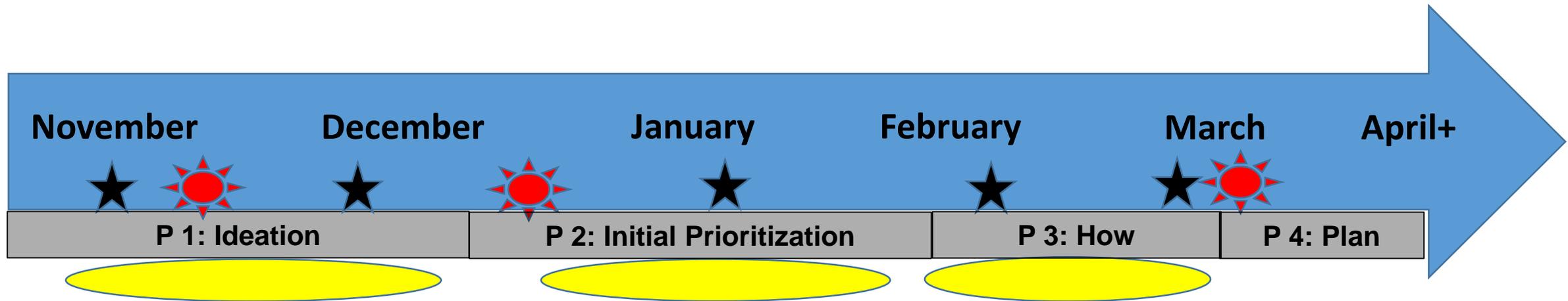




82 working days:

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

A²Zero Timeline & Work Products



★ TAC Meetings

☀ Partner Meeting

○ Online and Paper Surveys

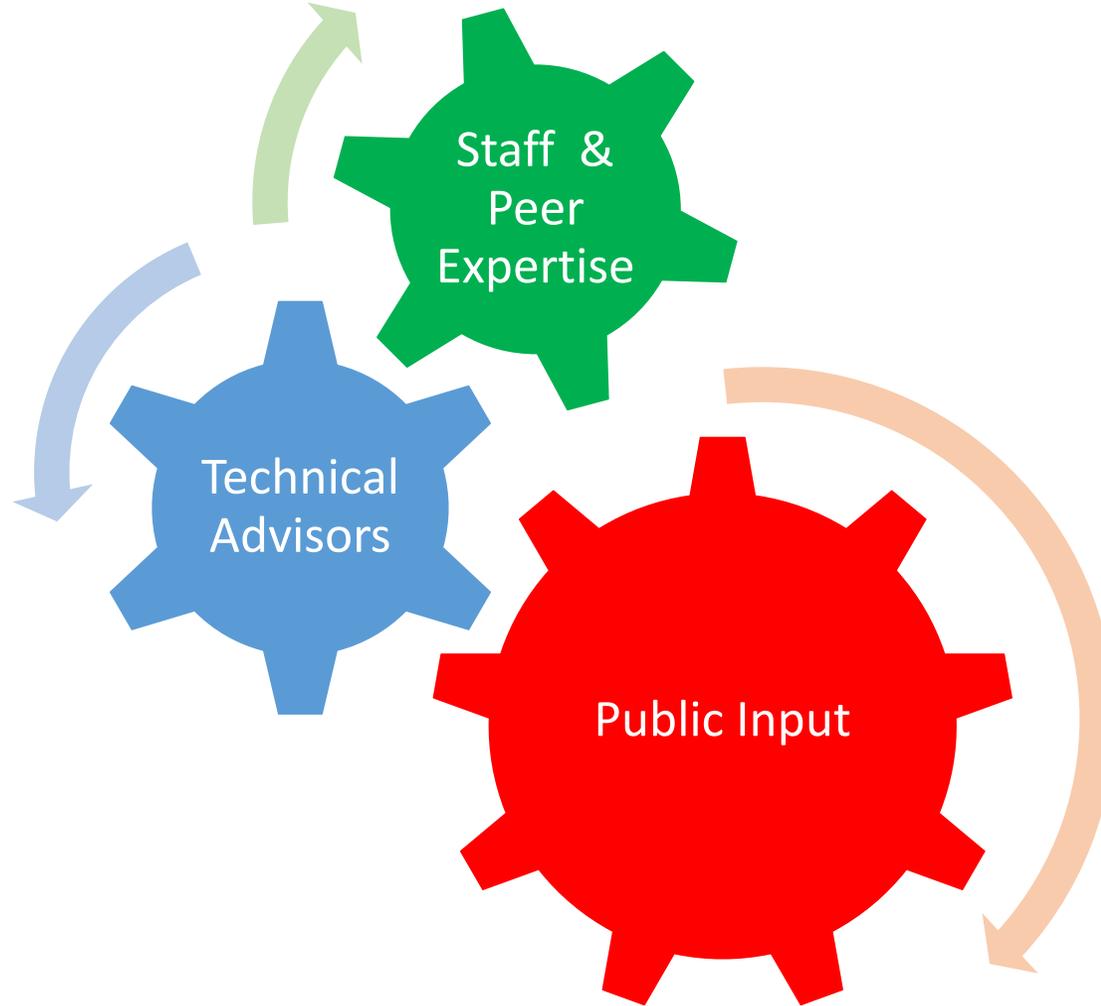
68 public events



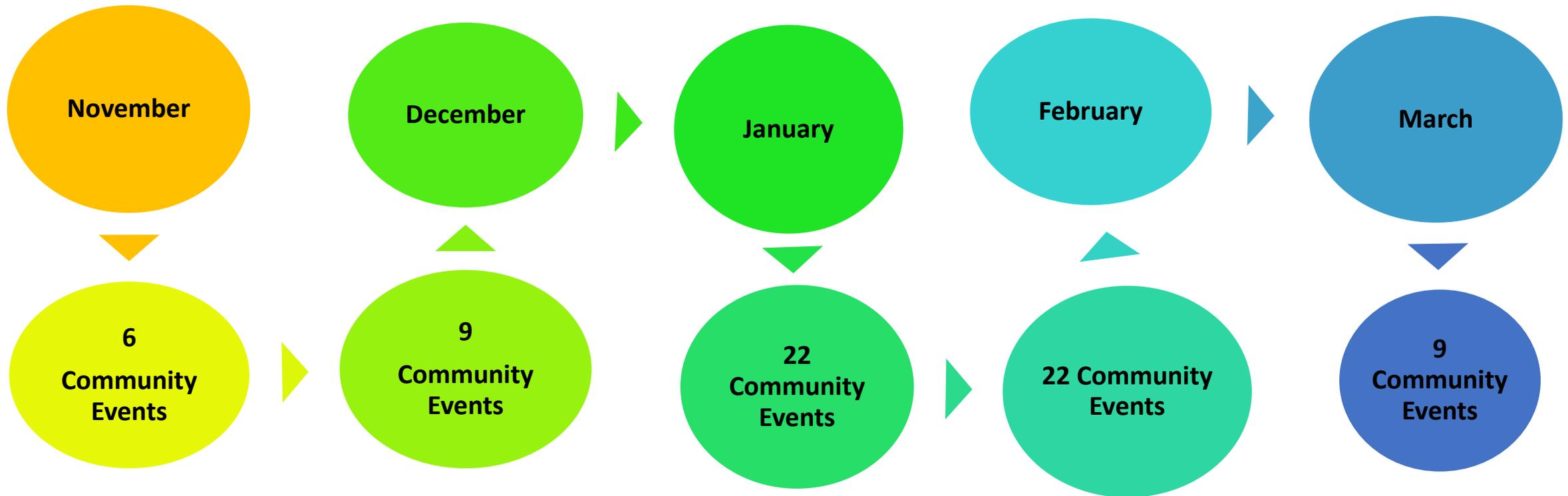
The Process

Process was iterative

Plan is living



68 A²Zero Public Engagements



Focused on receiving input from underrepresented groups

3 Public Surveys

- 270 to over 1000 responses
- Gauged residents' desire for certain actions by the City
- Gathered demographics of those taking the survey:
 - 71% White
 - 3% Asian
 - 2% Black
 - 1% Hispanic
 - 23% All Other
 - Median age: 40-59
 - Median Income: \$75,000-\$99,999

Why

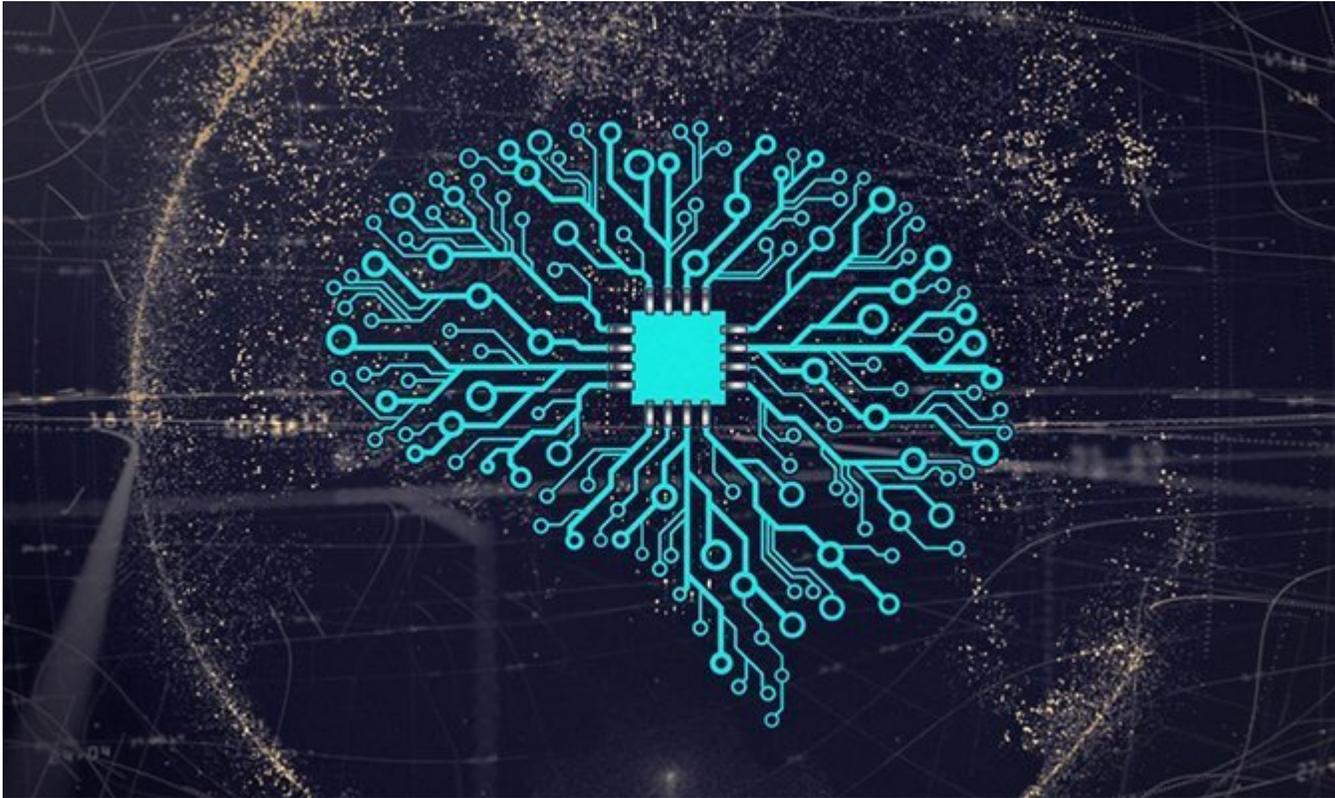
What

How

The Strategy

What do we propose to do?

Interconnected



- Strategies and their corresponding actions are entangled
- Removal has cascading impacts

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

Strategy 1: Powering Our Electrical Grid with 100% Renewables

- Community Choice Aggregation
- On-Site Renewable Energy Generation with Battery Storage (Bulk Buys)
- Community Solar Program
- Landfill Solar Project

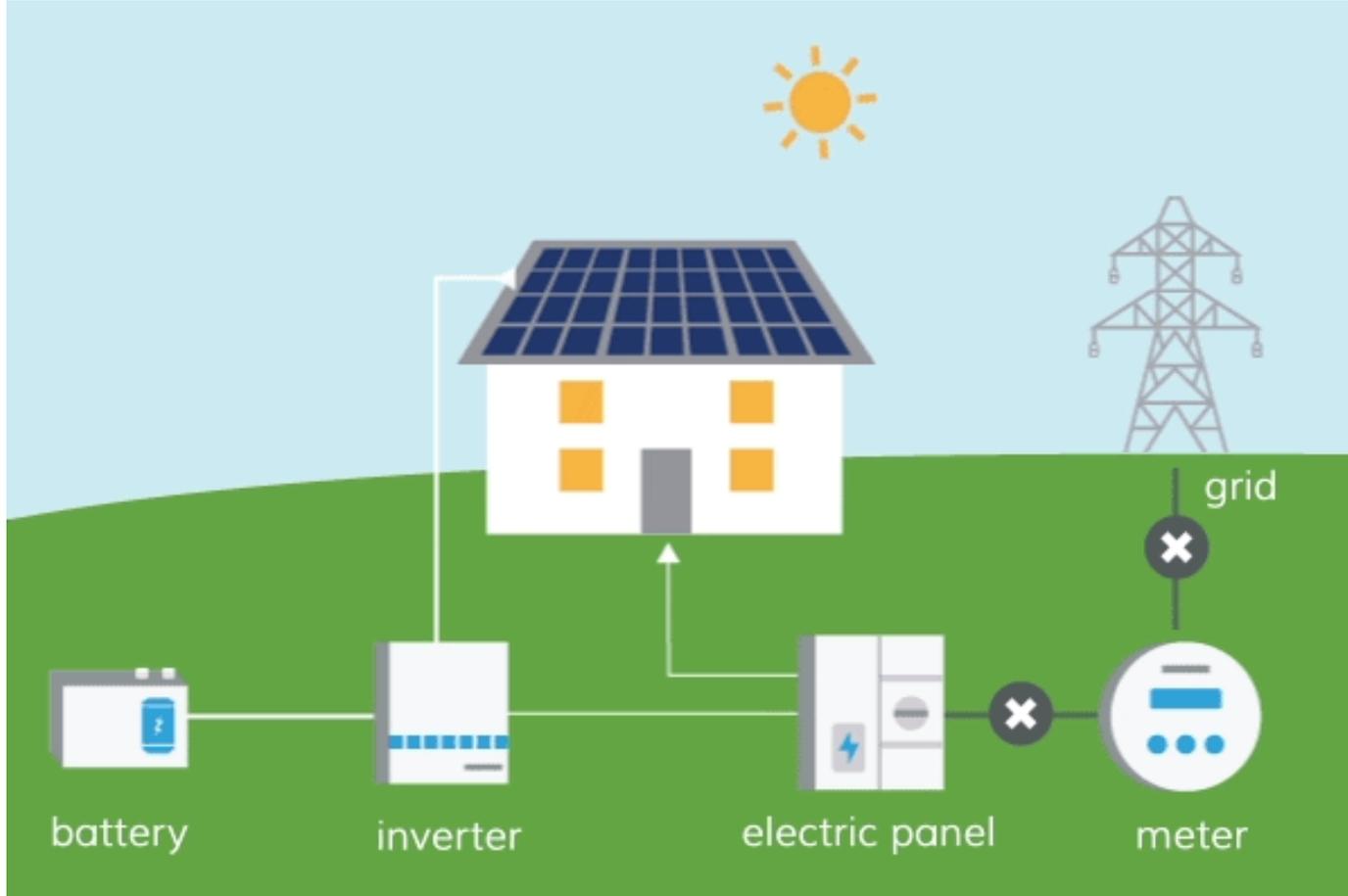


Powering Our Electrical Grid with 100% Renewables: Community Choice Aggregation



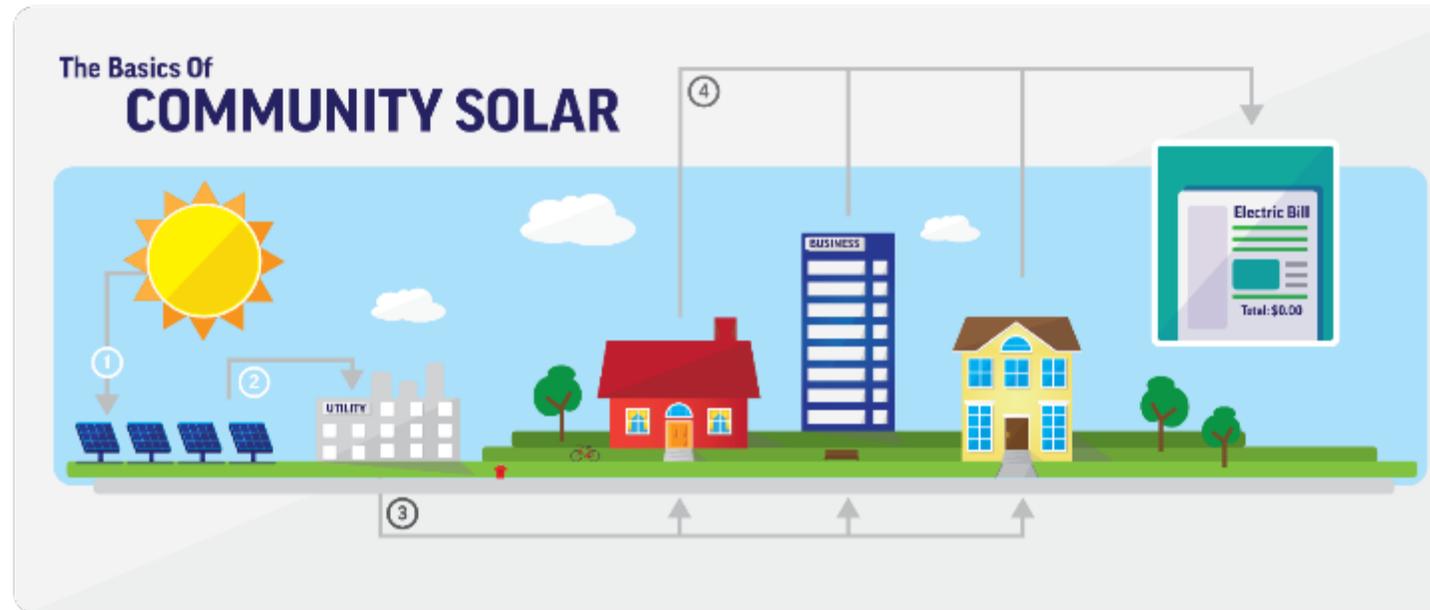
- Community Choice Aggregation (CCA) allows local governments to procure power on behalf of the community
- A CCA would allow the City to purchase 100% renewable energy for community demands
- A CCA could also lead to parity or even savings when compared to existing electrical costs

Powering Our Electrical Grid with 100% Renewables: Onsite Renewable Energy Generation and Battery Storage



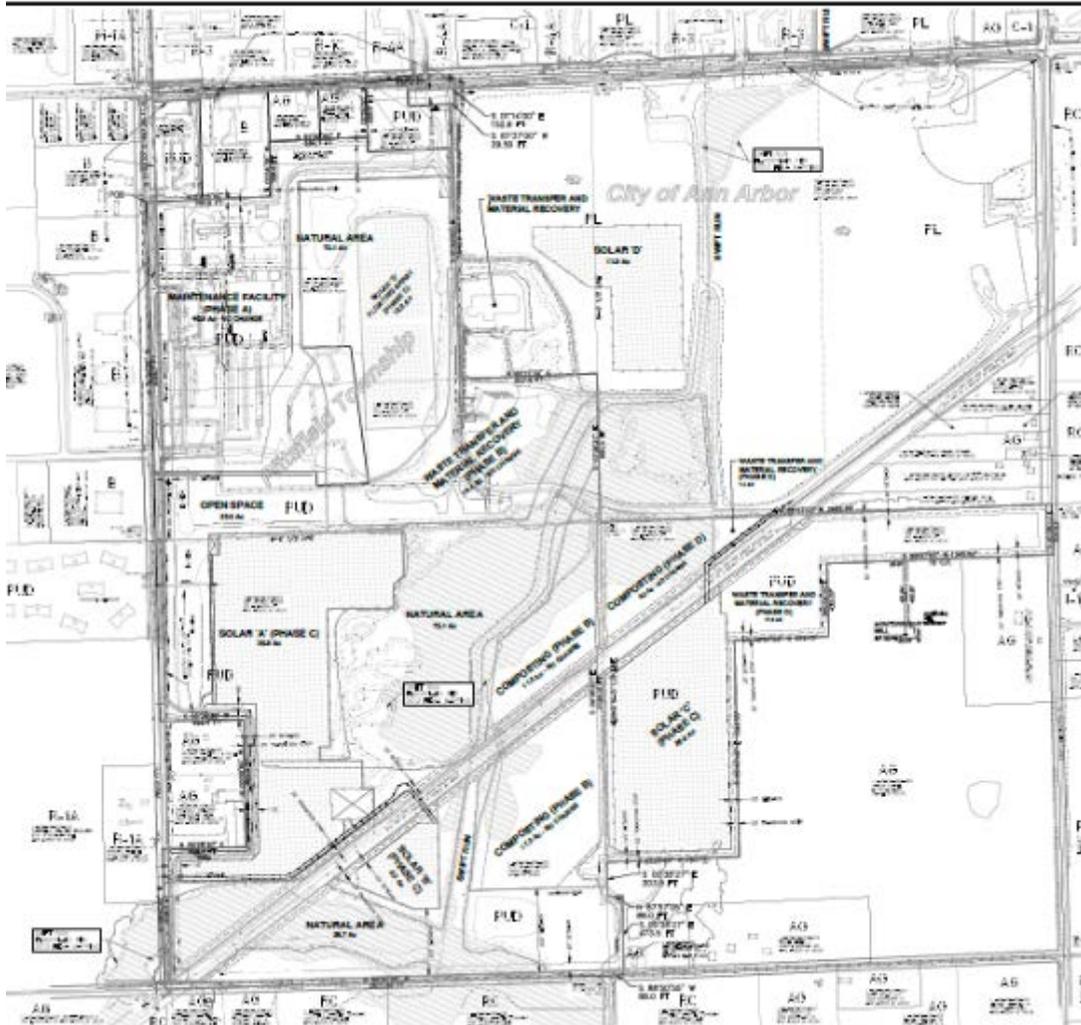
- Focuses on taking advantage of our local solar potential
- Bulk buys can help lower the upfront capital costs by connecting contractors with residents

Powering Our Electrical Grid with 100% Renewables: Community Solar Program



- Not all residents can install solar on their property.
- Community Solar provides options to all who want to invest in solar locally by allowing solar installations on public properties with public ownership of the assets.

Powering Our Electrical Grid with 100% Renewables: Landfill Solar Project

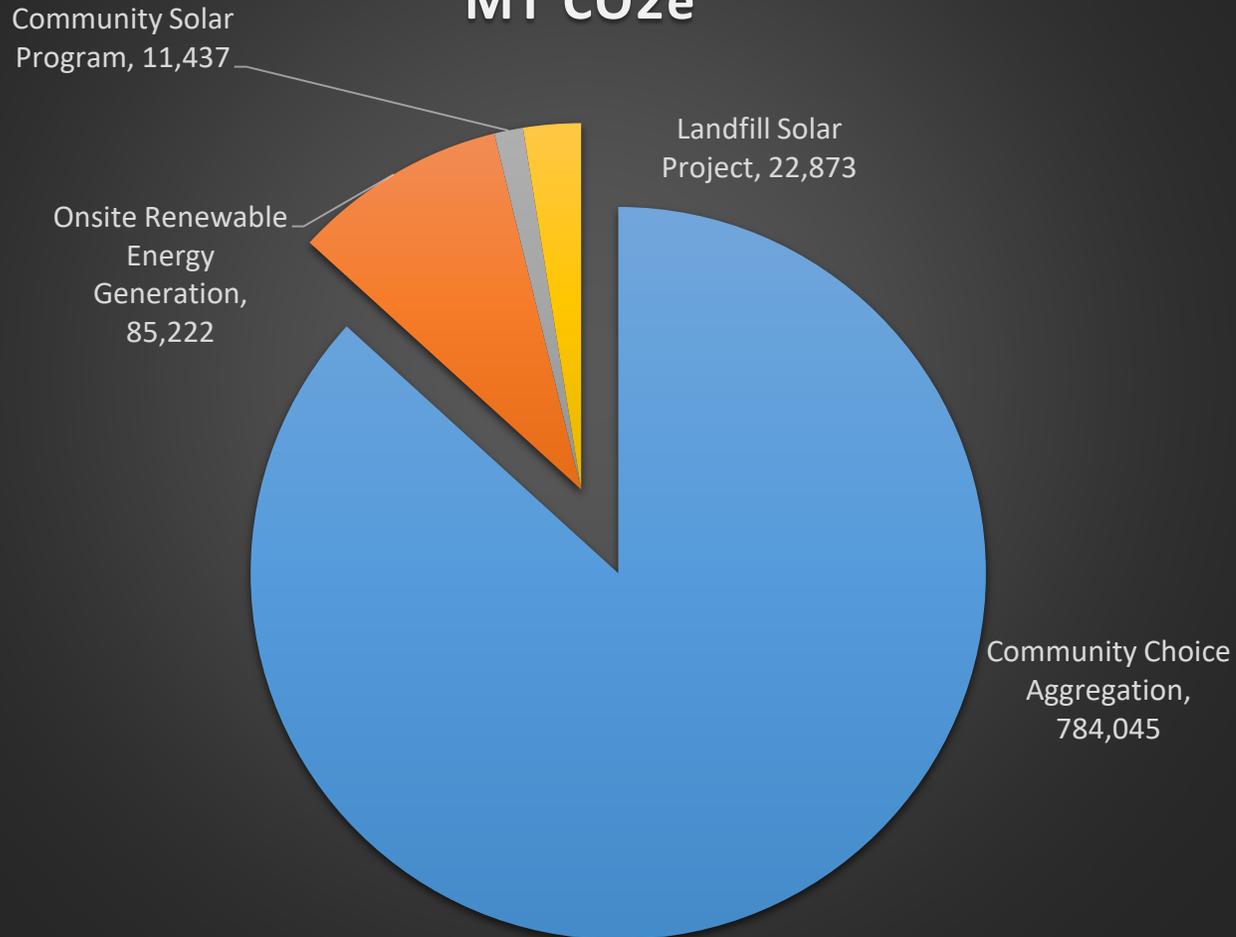


- Utility-scale solar project sized to provide enough energy to offset roughly 80% of Ann Arbor municipal energy usage
- If demand exists and enabling legislation is passed, the solar project may be integrated into a community solar program

Summary

Strategy 1: Powering our electrical grid with 100% renewable energy. Summary

MT CO₂e



Assuming UM Participation:

41% Total Reduction

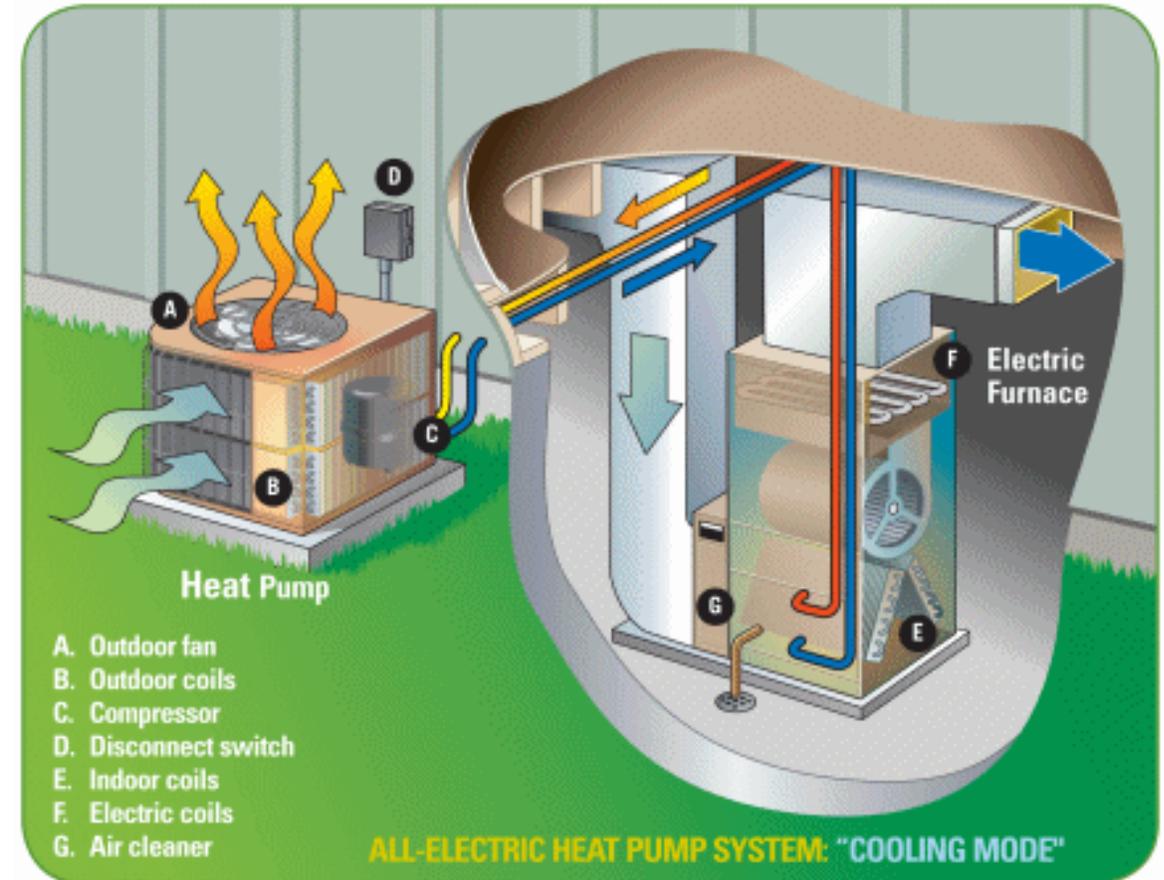
Strategy 2: Switching our Appliances and Vehicles from Gasoline, Diesel, Propane, and Natural Gas to Electric

- Home and Business Electrification Policies and Support
- Electrify Buses
- Support Community Electric Vehicle and Solar Bulk Buys
- Electrify City Fleet
- Electrify Private Fleet
- Expansion of Electric Vehicle Charging Infrastructure



Switching Appliances and Vehicles to Electric: Home and Business Electrification Policies and Support

- Electrifying our appliances will help reduce methane emissions – which are 25 times better at warming the atmosphere compared to CO₂e
- Involves establishing policies that promote electrification of heating and cooking systems by evaluating options in codes, programs, etc.
- Includes an EV Readiness Ordinance



Switching Appliances and Vehicles to Electric: Electrify Buses



- Electrifying TheRide's diesel and diesel-hybrid bus fleet of 87 buses as well as the University of Michigan's ethanol, biodiesel, and gasoline buses on an aggressive time line.
- Powering buses with renewable energy

Switching Appliances and Vehicles to Electric: Support Community EV and Solar Bulk Buys

- Group-buy programs increase the accessibility of EVs by allowing potential EV purchasers to take advantage of bulk purchase or lease discounts.
- Coupling EV group-buy programs with purchase programs for residential solar installation
- Creation of incentives for low-income residents to purchase an off-lease or used EV



Switching Appliances and Vehicles to Electric: Electrify City Fleet



- Transitioning the City's light duty vehicles to 100% electric by 2025
- Replacing all viable heavy vehicles and equipment as feasible

Switching Appliances and Vehicles to Electric: Electrify Private Fleet



- Support companies with transitioning fleet to electric
- Work with state and utilities to offer more rebates and incentives



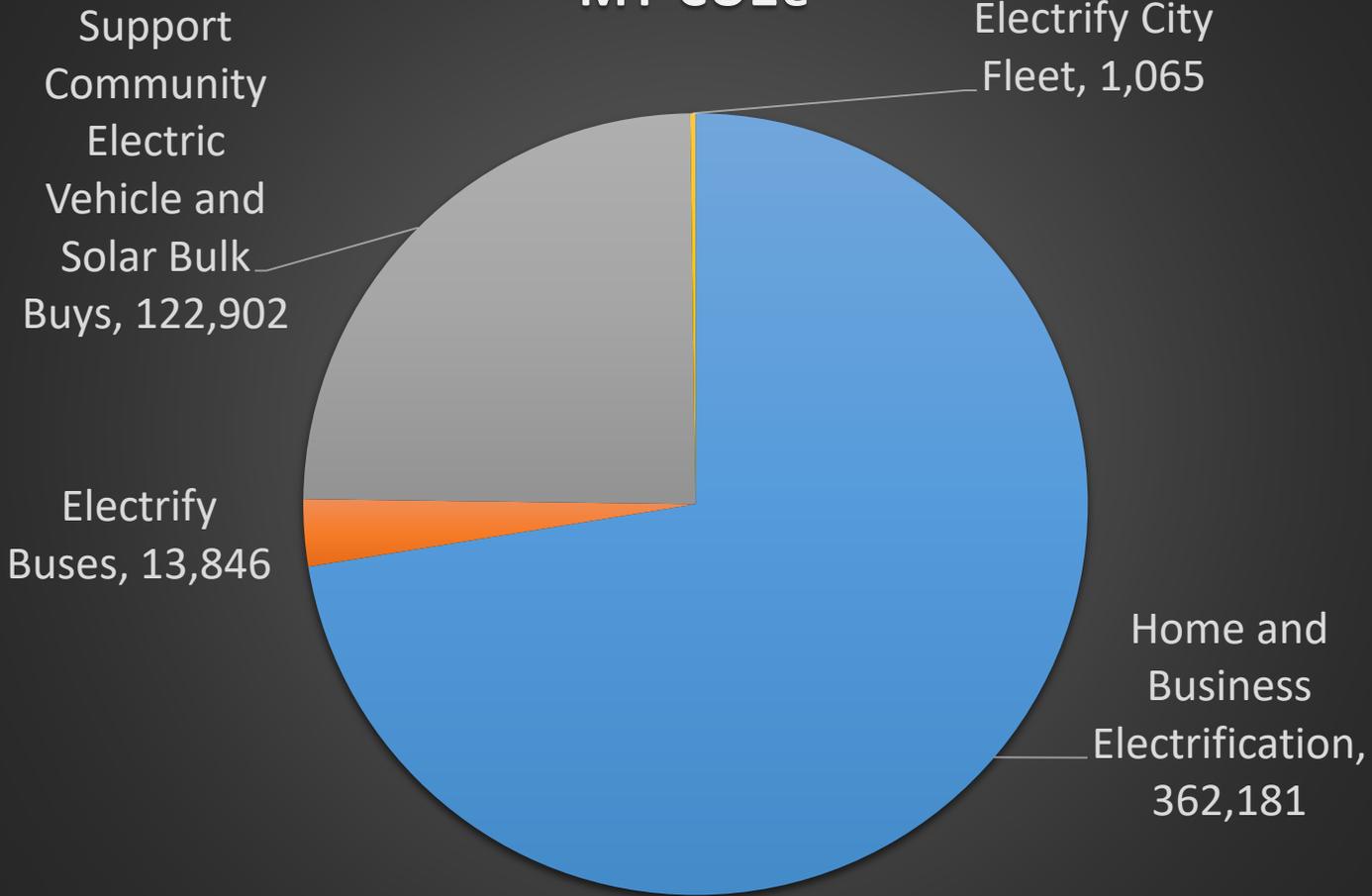
Switching Appliances and Vehicles to Electric: Expansion of Electric Vehicle Charging Infrastructure

- Ensuring we have plentiful EV charging infrastructure throughout the community (garages, work places, on-street)



Summary

Strategy 2 Summary, U-M Participating MT CO₂e



Assuming UM Participation:

23% Total Reduction

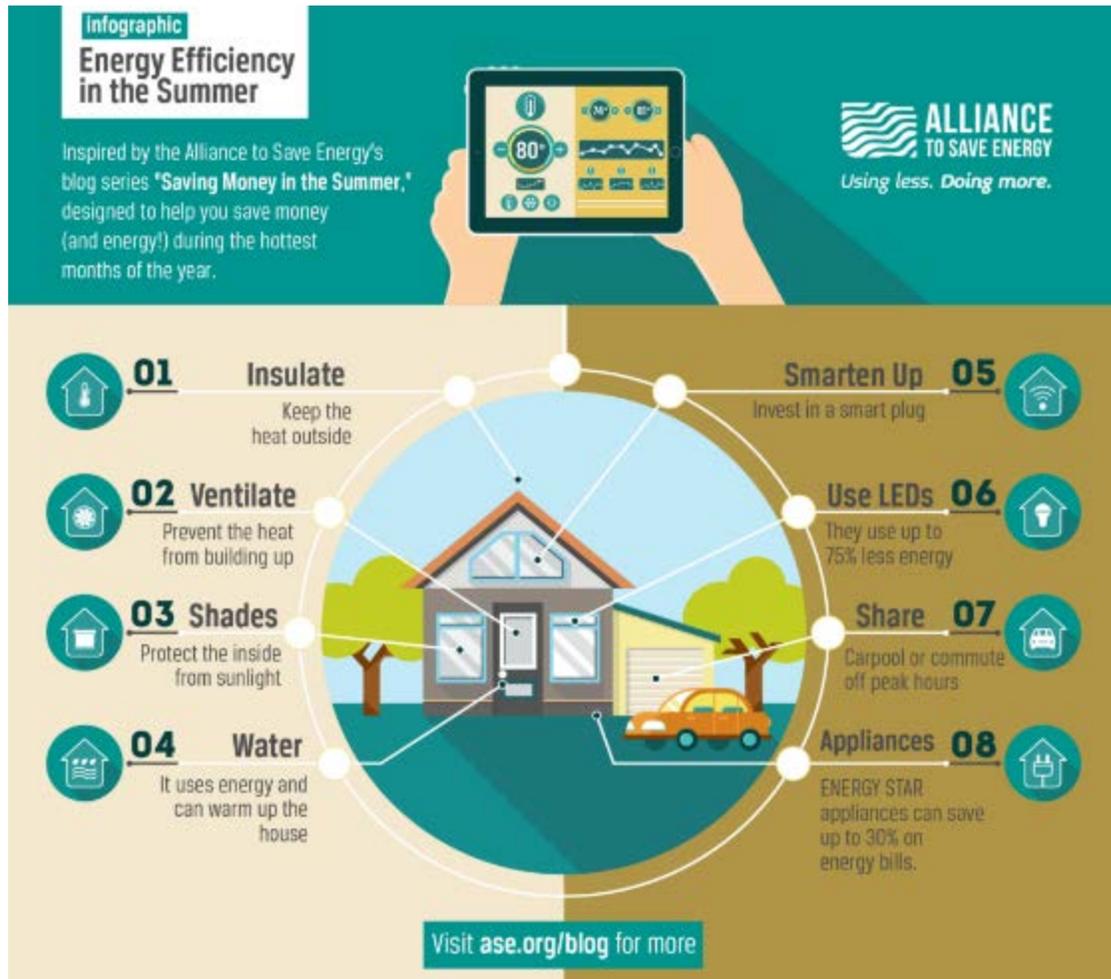
Strategy 3:

Significantly improving the energy efficiency in our homes, businesses, schools, places of worship, recreational sites, & government facilities

- Support Transition to More Energy Efficient Homes and Businesses
- Update Building Codes
- LED Powered Streetlights and Traffic Signals
- Energy Disclosure / Benchmarking
- Loan Loss Reserve
- Energy Concierge and Community Education
- Net Zero Energy Affordable Housing
- Green Business Challenge
- Green Rental Housing Program
- Aging in Place Efficiently
- Expansion of Weatherization Program

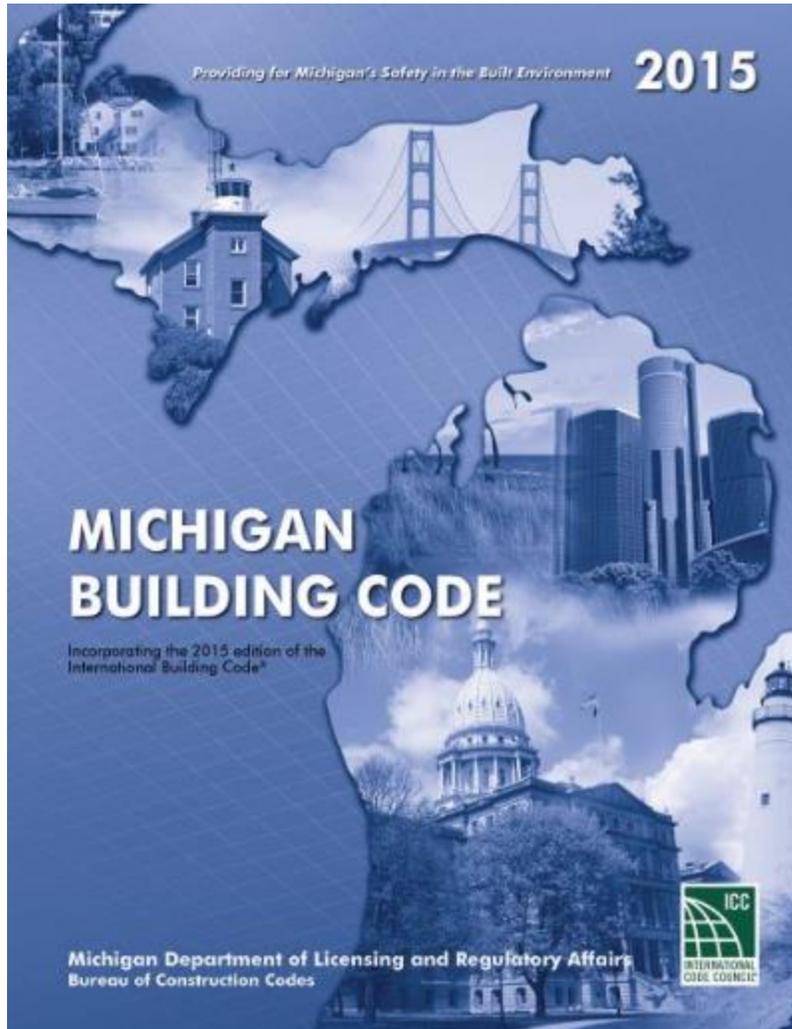


Significantly Improving our Energy Efficiency: Transition to More Efficient Homes and Businesses



- Improving building envelopes with better insulation and windows, efficient lighting and appliances, and advanced heating and cooling systems
- Through group buys, the City can help lower the upfront costs of these upgrades, many which will pay for themselves

Significantly Improving our Energy Efficiency: Update Building Codes



- Buildings are the largest source of greenhouse gas emissions locally
- In Michigan, residents are constrained by the State's building code as to what type of upgrades and standards are applied to new buildings
- We will work with the state to pass the 2021 building code and the zero code appendix so that all new developments and major renovations in Ann Arbor can be net zero energy

Significantly Improving our Energy Efficiency: LED Powered Streetlights, Crosswalks, & Outdoor Lighting



The City has started converting streetlights in our community from conventional lights to LEDs, the most energy-efficient bulbs available, which can reduce energy usage by up to 70 percent, significantly reduce maintenance costs and greenhouse gas emissions

Significantly Improving our Energy Efficiency: Energy Disclosure/Benchmarking

ENERGY EFFICIENCY & DISCLOSURE



- Ensuring residents and business owners understand the energy costs of renting and living in homes
- Knowing the costs can lead to more informed decisions on making energy efficiency improvements that can pay for themselves and save the occupant money

Significantly Improving our Energy Efficiency: Loan Loss Reserve



A fund to provide credit enhancements for residents with lower credit scores, expanding those who can finance energy efficiency, renewable energy, fuel switching, and electric vehicle purchases

Significantly Improving our Energy Efficiency: Energy Concierge & Community Education



Creation of an easy to use energy concierge service that can help answer questions and supports residents with making energy improvements with the highest impact and in the most affordable way.

Significantly Improving our Energy Efficiency: Net Zero Energy Affordable Housing



The Office of Sustainability and Innovations has been working with the housing commission to find ways to reduce energy consumption through upgrades that make the housing commission residences net zero. We propose continuing this partnership.

Significantly Improving our Energy Efficiency: Green Business Challenge

GREEN BUSINESS CHALLENGE



AN **ICLEI** **USA** PROGRAM

- The program would encourage businesses to engage in more sustainable actions, providing them with technical assistance and guidance, and recognize businesses that are leaders in sustainability as models for others to follow
- The program promotes energy efficiency, renewable energy usage, waste reduction and material reuse, water reduction, and alternative transportation.

Significantly Improving our Energy Efficiency: Green Rental Housing Program



- Rental units make up 55% of Ann Arbor's housing stock.
- The Green Rental Housing program will add energy efficiency requirements into the existing City rental licensing process, thereby ensuring that every rental unit in Ann Arbor meets a minimum energy efficiency performance standard

Significantly Improving our Energy Efficiency: Aging in Place Efficiently



- This action helps low-income seniors age in a place of their choosing while improving the energy efficiency of their residences
- Integrates energy efficiency improvements into a wide variety of existing services available to seniors in our community

Significantly Improving our Energy Efficiency: Expansion of Weatherization Program



Home
Improvement
Programs

BROKEN FURNACE?
DRAFTY HOUSE?
CAN'T AFFORD REPAIRS? **GIVE US A
CALL!**

734.544.3008

<http://bit.ly/OCEDweatherization>

Our office has multiple programs* that can help make your home more comfortable and lower your energy bills.

These include furnace repair or replacement, refrigerator replacement, insulation improvement, and more.



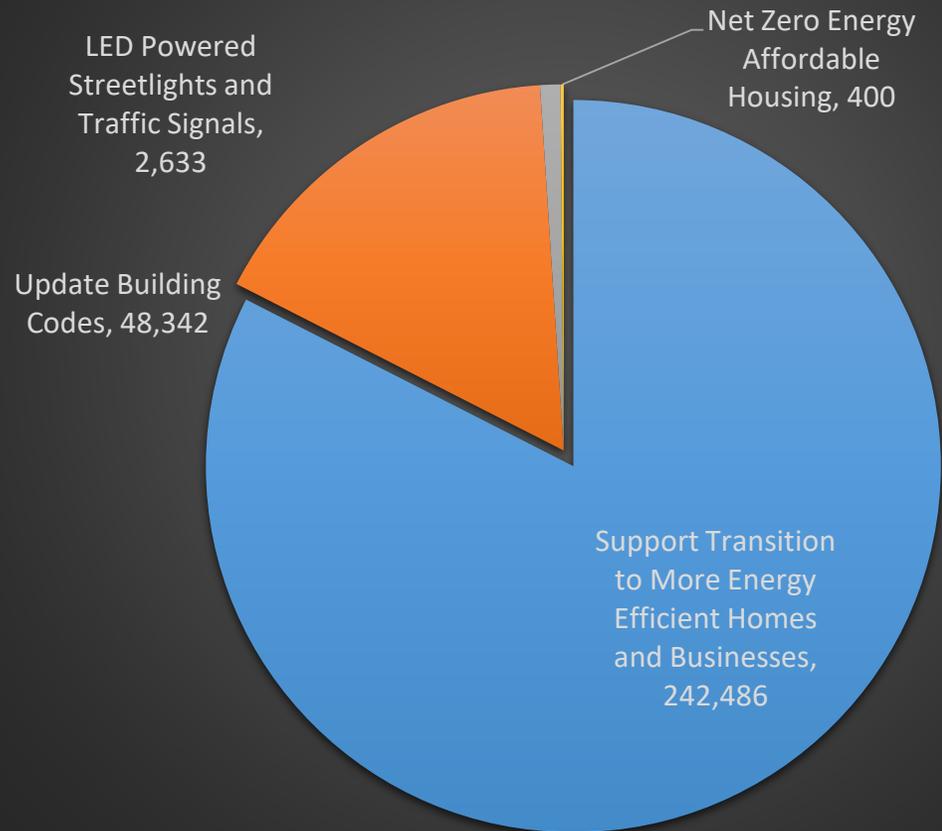
We work with and oversee approved contractors to ensure work is done correctly!

*Program eligibility varies based on household income. These programs typically serve low to low/moderate income households.

- Washtenaw County and multiple other nonprofits offer weatherization services to low-income homeowners in Ann Arbor
- This action would expand this program to support more low-income homeowners in the City so they can access these services

Summary

Strategy 3: Significantly improving energy efficiency Summary MT CO2e



Assuming UM Participation:

14% Total Reduction

Strategy 4: Reduce the Miles we Travel in our Vehicles by at least 50%

- Implement Non-Motorized Plan
- Expand and Improve Local Transit
- Expand and Improve Regional Transit
- Increase Number of Park and Rides and Ensure Seamless Connection to Transit
- Increase the Diversity of Housing Allowed by Right
- Mixed-Use Neighborhoods
- Tiered Parking Rates



50% Reduction in Vehicle Miles Traveled: Implement the Non-motorized Transportation Plan

The City's Non-motorized Transportation Plan set a goal for 25% of all in-city trips to be by foot, bicycle, or other self-propelled modes.

New infrastructure needed:

- Sidewalks
- Road crossings
- Separated bike lanes
- Streetlights
- Traffic devices
- Connections between public transit and active transport modes



50% Reduction in Vehicle Miles Traveled: Expand and Improve Local Transit



Expand and improve transit service to significantly increase ridership

Improvements:

- Longer service hours
- New routes
- Dedicated bus lines and bus rapid transit along major transportation corridors
- Get Downtown Program offered to companies outside of downtown

50% Reduction in Vehicle Miles Traveled: Expand and Improve Regional Transit

80,000 commuters come into Ann Arbor for work, school, or recreation every work day.

New regional transit service to and from Plymouth, Jackson, Detroit, Brighton, Ypsilanti, and Ypsilanti Township serves 25% of commuter trips into and out of Ann Arbor

Regional transit service can help:

- Decongest roads
- Improve local health
- Reduce stress



50% Reduction in Vehicle Miles Traveled: Park and Rides with Transit

Ann Arbor has 1,300 free Park and Ride parking spaces currently. This action would increase the number of Park and Ride spots ten-fold

These Park and Rides would provide electric vehicle charging and seamless connections to public transit

They will displace 25% of commuter trips into the City



50% Reduction in Vehicle Miles Traveled: Increase the Diversity of Housing Allowed By Right



Allowing more housing, up to four-unit residential buildings and Accessory Dwelling Units (ADUs) has been shown to reduce greenhouse emissions by increasing the walkability and livability of neighborhoods while creating more accessible housing to a wider array of community members.

50% Reduction in Vehicle Miles Traveled: Mixed Use Neighborhoods



- Helping residents to walk and bike to places of their choosing necessitates having the proper infrastructure in place as well as having the places they desire going within walking and biking distance.
- This action focuses on updated zoning code to allow mixed-uses in residential neighborhoods so that things such as bakeries, grocery stores, breweries, coffee shops, etc. can be accessible in nearly all of our neighborhoods.

50% Reduction in Vehicle Miles Traveled: Tiered Parking Rates

Dis-incentivizing driving into the City by increasing the cost to park, but lowering rates for low-income residents, disabled individuals, and electric vehicle drivers.

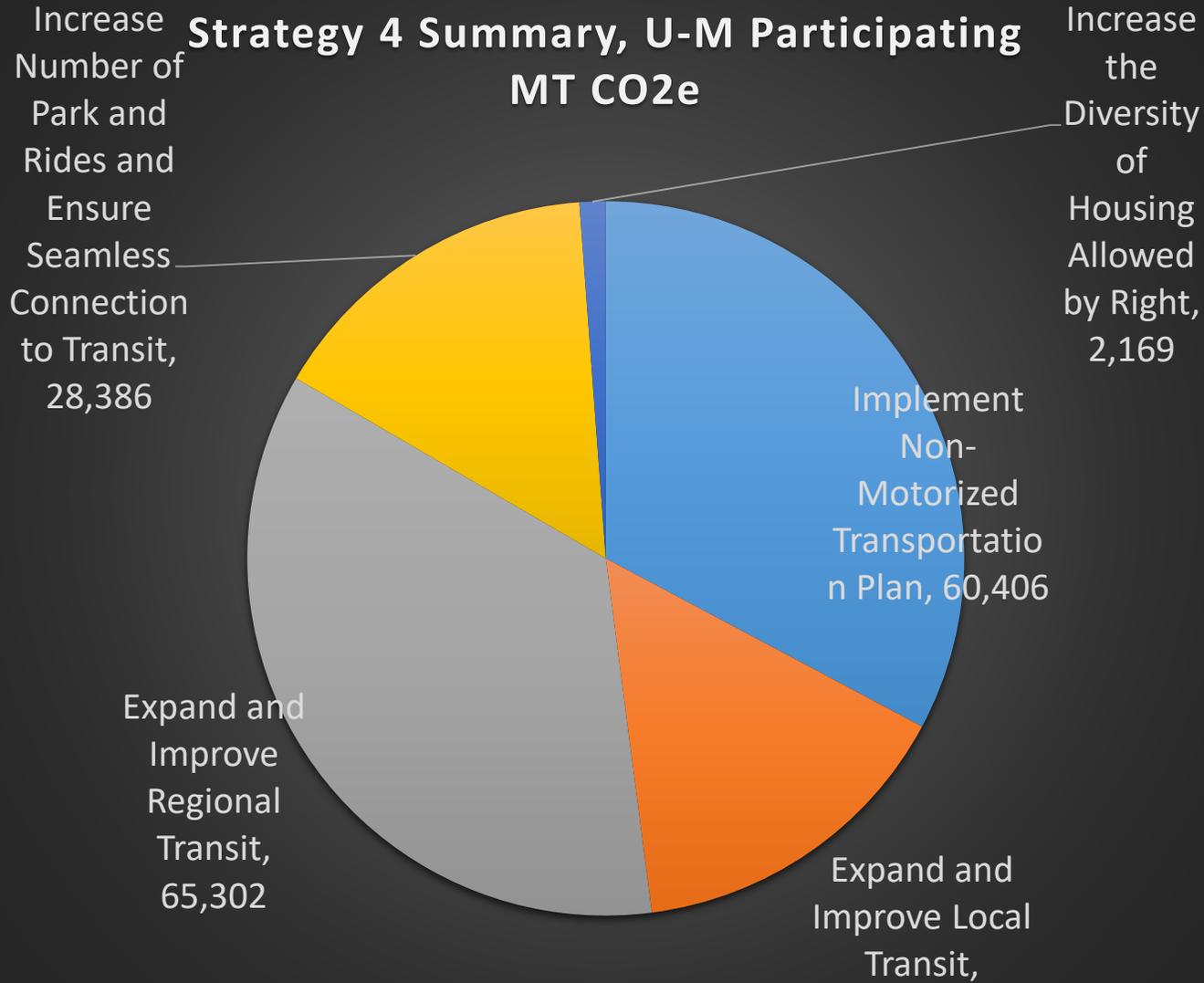
This includes:

- Deploying smart metering
- Establishing dynamic pricing
- Eliminating all parking minimums
- Setting low parking maximums



Summary

Strategy 4 Summary, U-M Participating MT CO2e



Assuming UM Participation:

8% Total Reduction



Strategy 5: Significantly Change the way we Use, Reuse, and Dispose of Materials

- Expansion of Composting Program
- Expansion of Commercial Recycling
- Require Sustainable Materials in New and Existing Developments
- Move Toward a Circular Economy
- Support a Plant Rich Diet
- Enhance Refrigerant Recycling and Reuse Program



Change the Way We Use, Reuse, & Dispose of Materials: Expansion of Composting Program



- Aims to increase food composting to year round, diverting food and yard waste from the waste stream
- Saves methane emissions and helps produce valuable compostable materials that can be used locally

Change the Way We Use, Reuse, & Dispose of Materials: Expansion of Commercial Recycling

- Through a series of incentives, education, and enforcement, this action focuses on getting commercial sector recycling rates to at least 30%

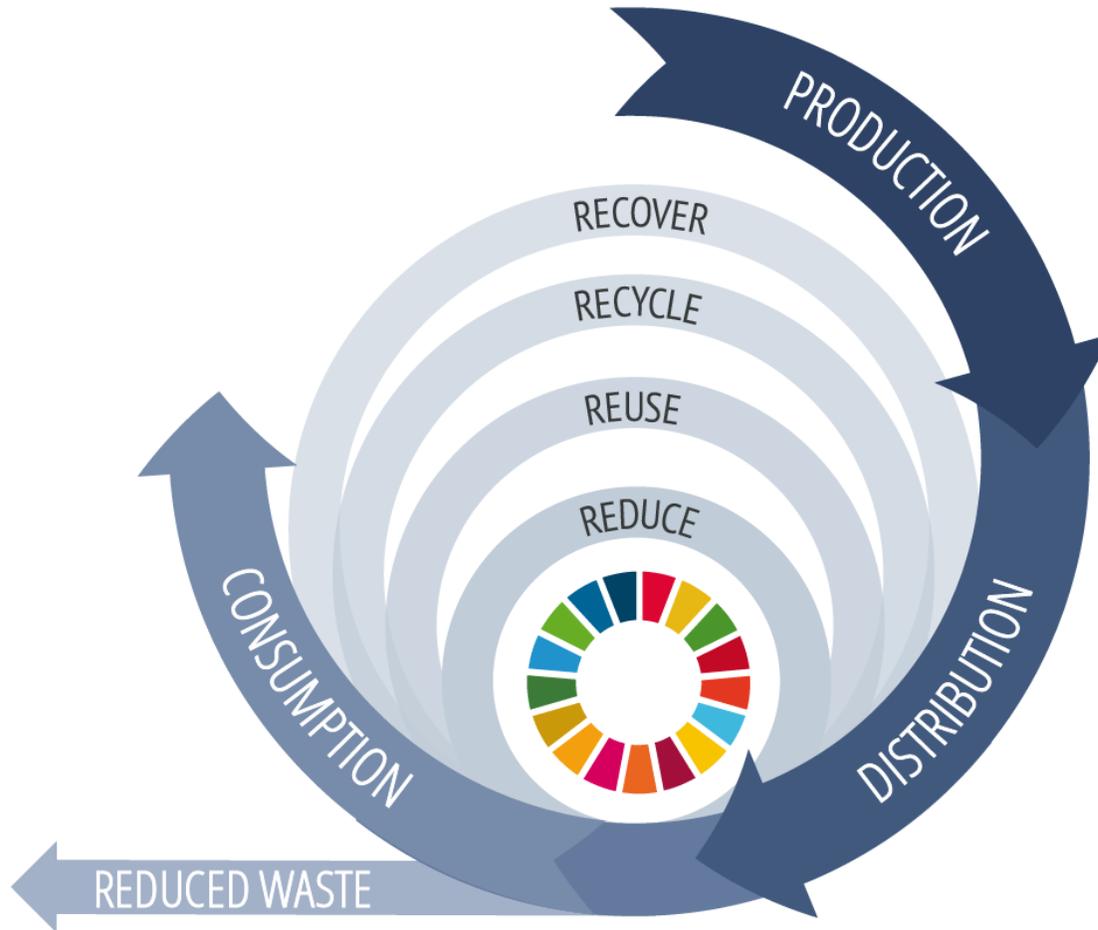


Change the Way We Use, Reuse, and Dispose of Materials: Require Sustainable Materials in New and Existing Developments

- Involves implementation of existing draft City plan for Construction and Demolition waste to ensure 100% of debris is captured and repurposed
- Involves expansion of the plan to require sustainable designs in new building approval process



Change the Way We Use, Reuse, & Dispose of Materials: Move Toward a Circular Economy



- Supporting actions to promote resource reduction, material reuse, and regeneration
- Includes working with peer municipalities to create tools that allow for more transparency, traceability, and the calculation of embedded GHG emissions for different materials, goods, and services

Change the Way We Use, Reuse, & Dispose of Materials: Support a Plant Rich Diet



- Educating the community about the health and environmental benefits of eating more fruits, vegetables, and grains, and less meat
- May include a GHG emissions disclosure (similar to a calorie disclosure)

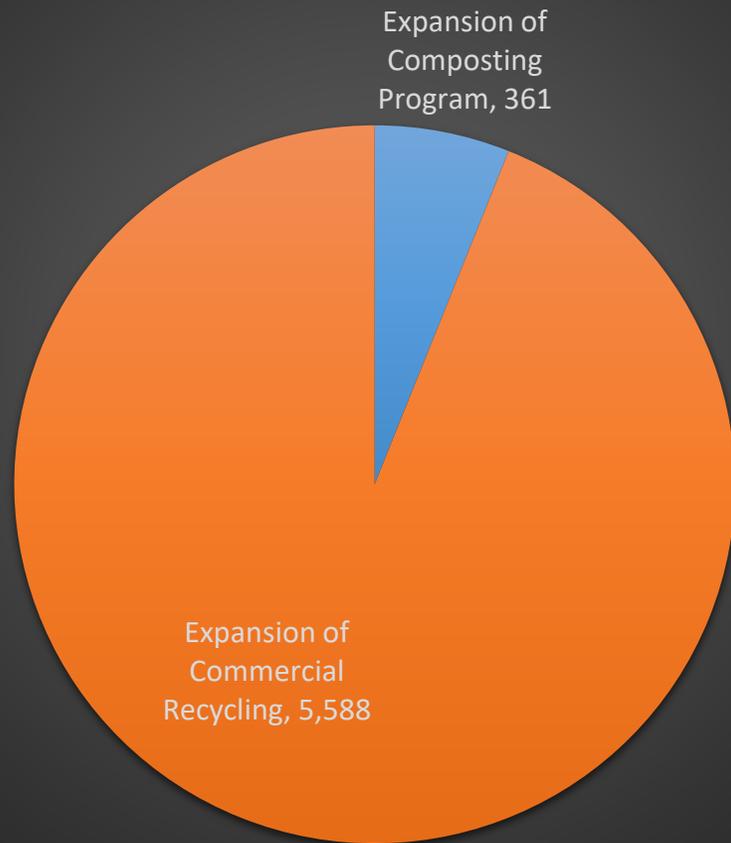
Change the Way We Use, Reuse, & Dispose of Materials: Refrigerant Recycling and Reuse

- Refrigerants are potent GHGs
- Focuses on ensuring we enhance refrigerant recycling programs and discourage refrigerant use when possible



Summary

Strategy 5: Materials Management MT CO2e



Assuming UM Participation:

**.3% Total
Reduction**

Strategy 6: Increase the Resilience of our People and our Place

- Invest in Resilience Hubs
- Foster Neighborhood and Youth Ambassadors
- Preserve and Enhance the Local Tree Canopy
- Conduct Asset and Needs Mapping of Neighborhoods
- Assist in Assembling and Disseminating Emergency Preparedness Kits
- Implement Sensors to Monitor Heat, Air Quality, Waterways, and Flooding



Enhance the Resilience of Our People and Place: Invest in Resilience Hubs

- Support residents and coordinate resources and services before, during, or after a natural hazard event
- Shift power to communities and increase neighborhood capacity
- Operate at the nexus of climate mitigation, climate adaptation, and equity

WHAT IS A RESILIENCE HUB?

OFF GRID SOLAR POWER

Designed to provide power during an emergency, and reconnect to the grid once power is restored.



RISK REDUCTION AND DISASTER TRAINING

Access to best practice re-construction information to be better prepared for future emergencies.



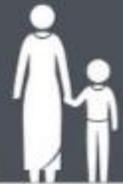
COMMUNICATION HUB

A single point for access to news and information during and after an emergency.



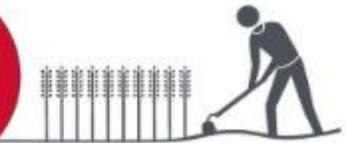
CLEAN WATER

Reinforcing existing water systems so communities have access to safe drinking water.



COMMUNITY GARDEN AND FARMING RESOURCES

To help small farmers recover lost supplies, seed and crops.



EXISTING COMMUNITY CENTER RESILIENCE HUB



Enhance the Resilience of Our People and Place: Foster Neighborhood and Youth Ambassadors Program

Work with interested stakeholders to rapidly scale up and out the A²Zero plan

Neighborhood and youth ambassadors will be trained and given the tools and resources to work with their peers to implement A²Zero



Enhance the Resilience of Our People and Place: Preserve and Enhance Local Tree Canopy

A properly managed and diverse urban forest increases resiliency against invasive insects that carry diseases and impact the human population.

The community benefits from increased shade and decreased heat island effects, while supporting biodiversity.

Careful planning and management will both help the City mitigate and adapt to changing climate conditions.



Enhance the Resilience of Our People and Place: Conduct Asset and Needs Mapping of Neighborhoods

Community mapping identifies safe gathering points in neighborhoods when events such as natural disasters and power outages occur.

Physical spaces, such as homes, are activated as shelters when necessary.



Enhance the Resilience of Our People and Place: Sensors and Data to Monitor Heat, Air Quality, Waterways, and Flooding

Monitors and sensors allow the City proactively manage threats and risks

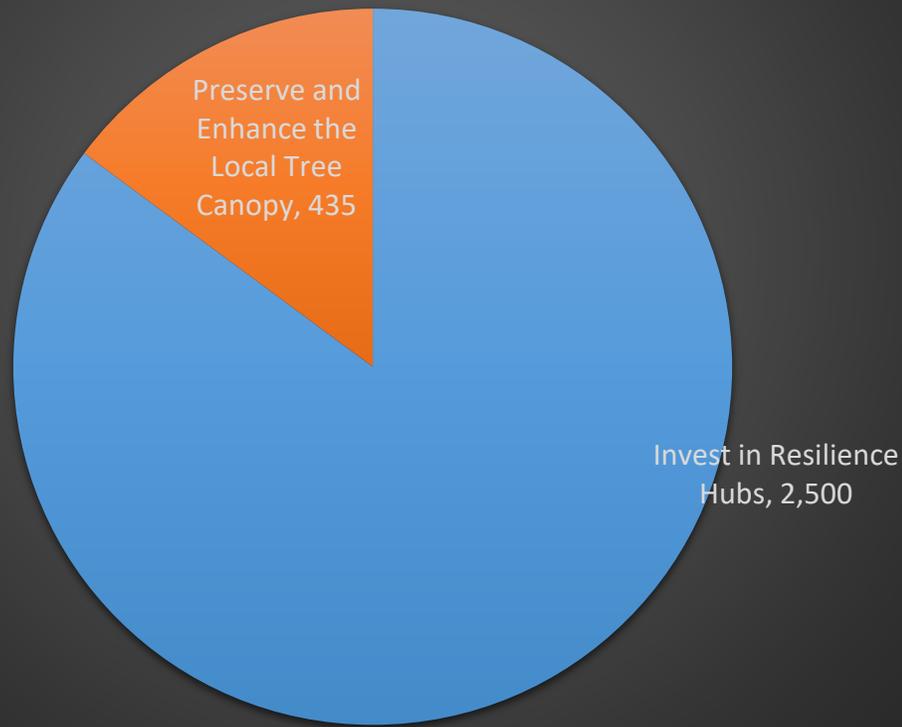
Real-time data protects public health, safety, and general welfare



Summary

Strategy 6: Enhancing the resilience of our people and our place. Summary

MT CO2e



Assuming UM Participation:

.1% Total Reduction

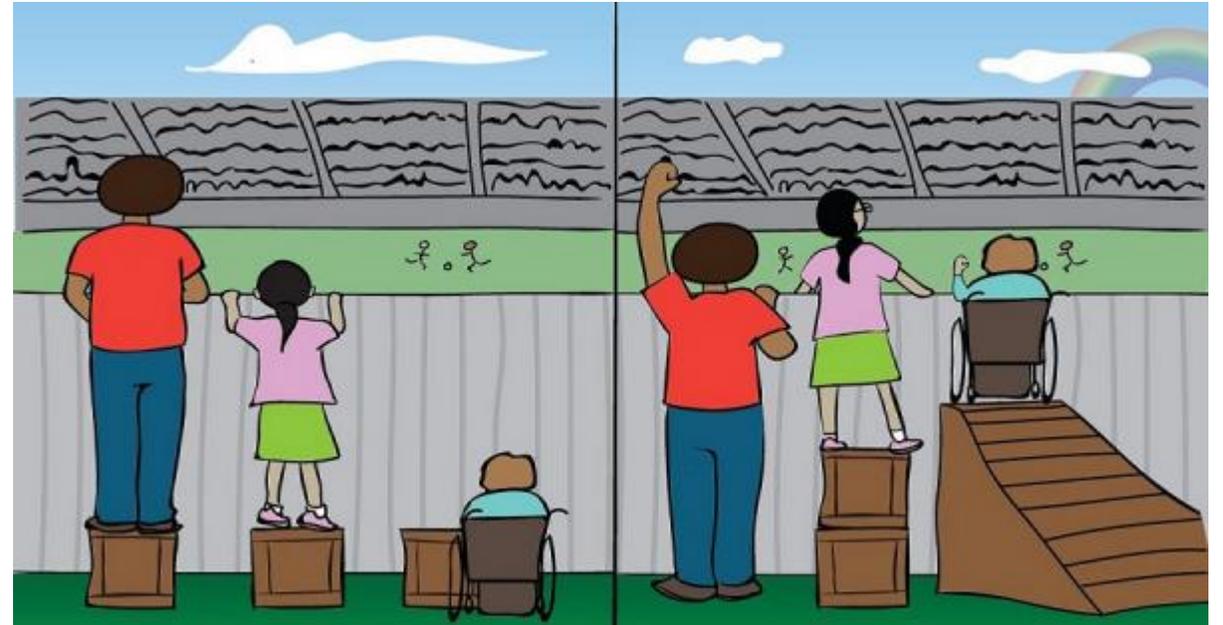
OTHER

- Equity Programs
- Sustaining Ann Arbor Together Grant Program
- Internal Carbon Price
- Greenhouse Gas Emissions Offsets



Other: Equity Programs

- Continue work to ensure equity is embedded in all of OSI's work
- Includes continued training, engaging equity advisors, deep community engagement, and strategic partnerships



Other: Sustaining Ann Arbor Together Grant Program



- Provide small grants to help advance sustainability initiatives in the community
- \$100,000 available per year

Other: Internal Carbon Price

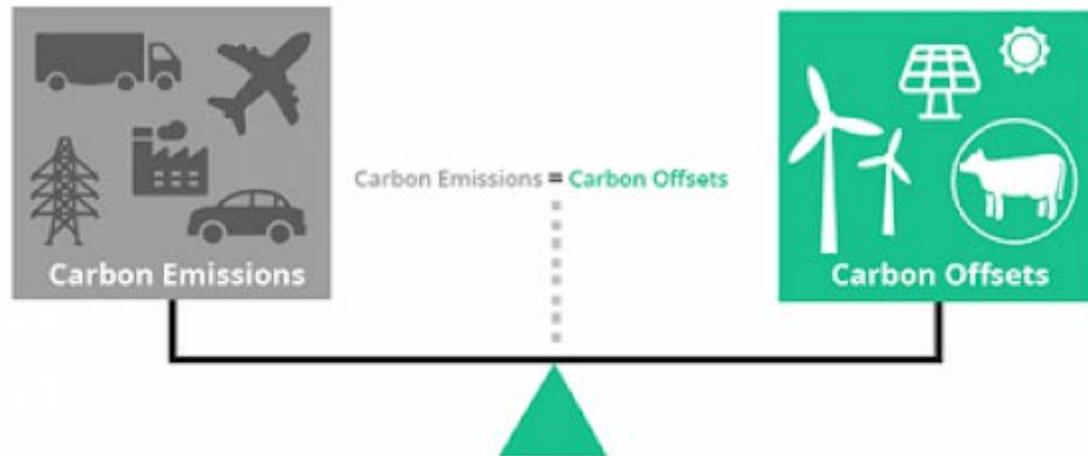
- Integration of carbon pricing onto City utility bills
- Funds support energy efficiency and renewable energy projects within the City
- Resources generated are used to invest in improvements within the enterprise fund from which they come



Other: Greenhouse Gas Emissions Offsets

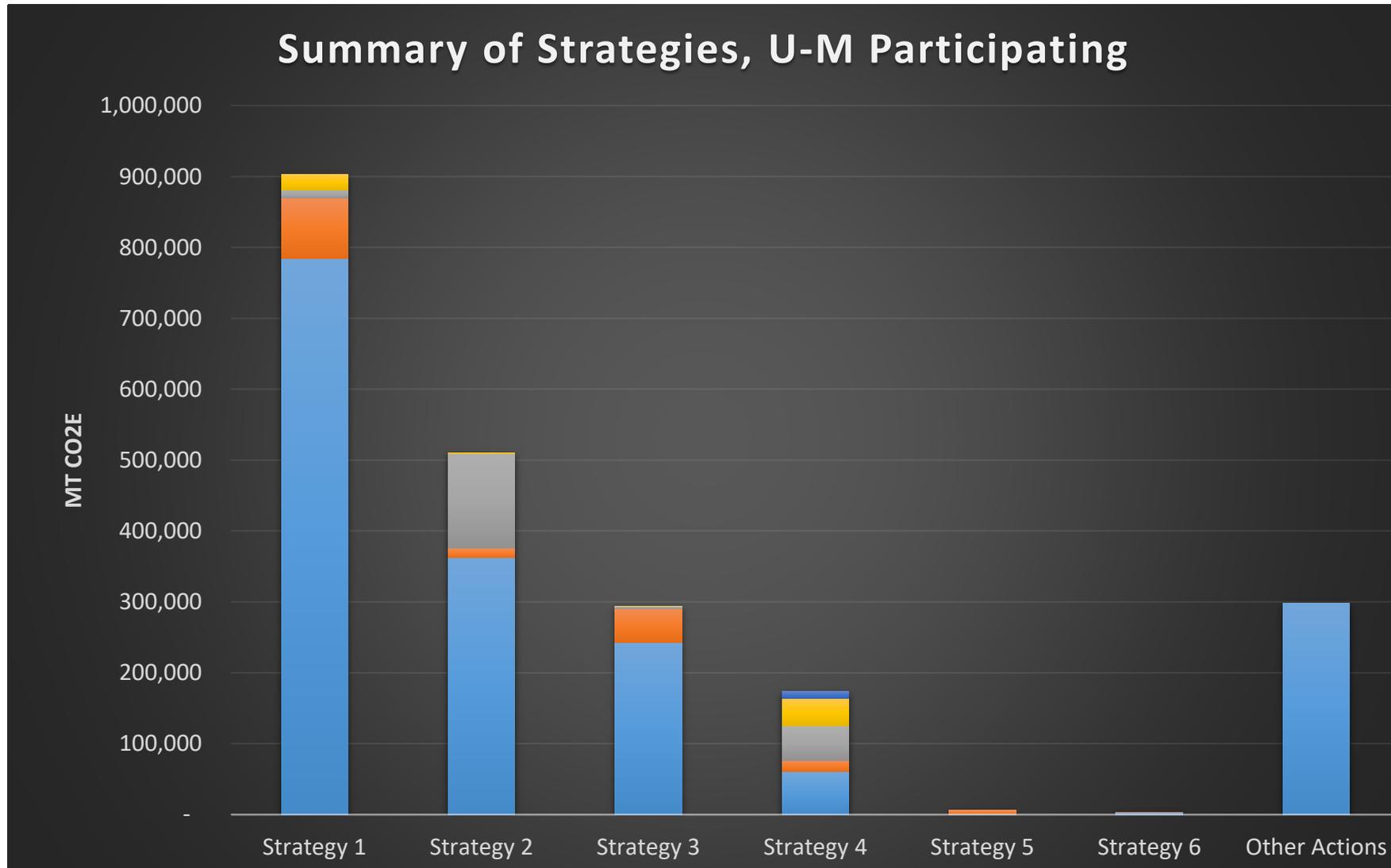
How a Carbon Offset works.

1 CO₂ Offset = 1 Metric Ton of Carbon Dioxide Reductions



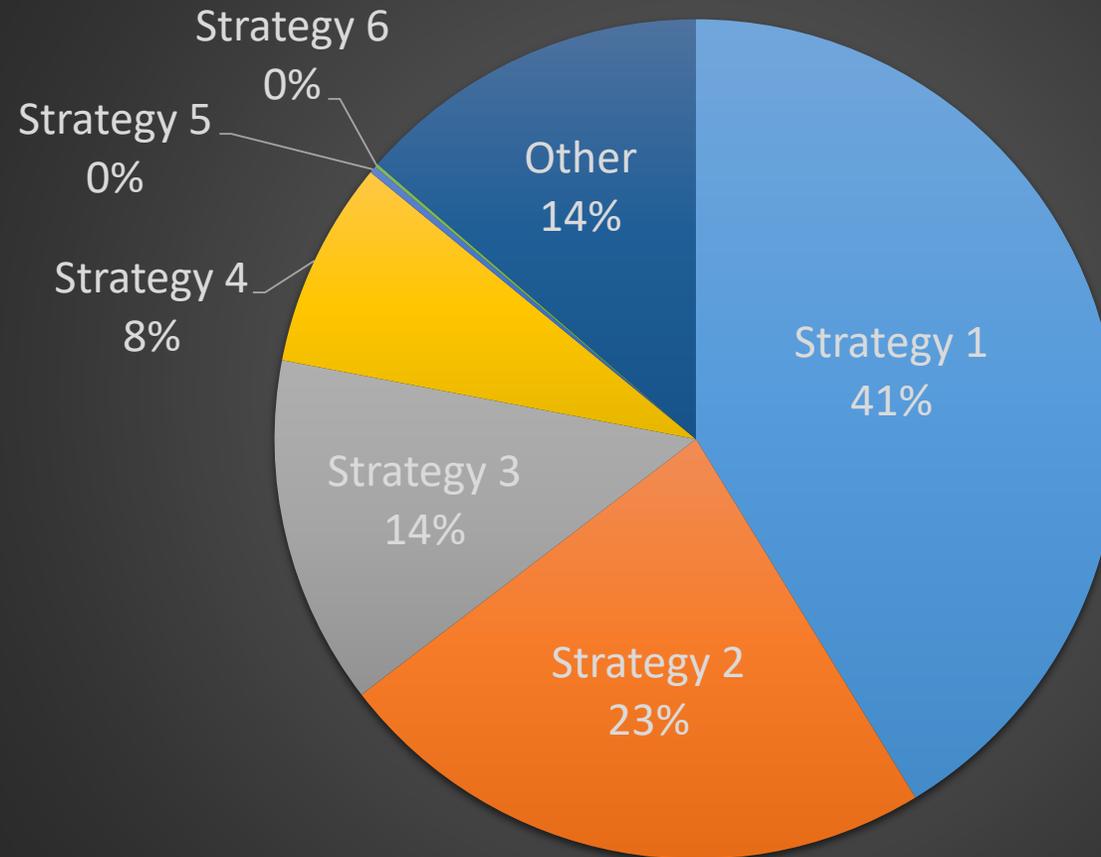
- Closes out the remaining GHG gap to achieve carbon neutrality
- Proposed they are:
 - Additional
 - Displacing fossil fuels
 - Focus on providing value in environmental justice communities
- Used as a bridge to full, local carbon neutrality

SUMMARY

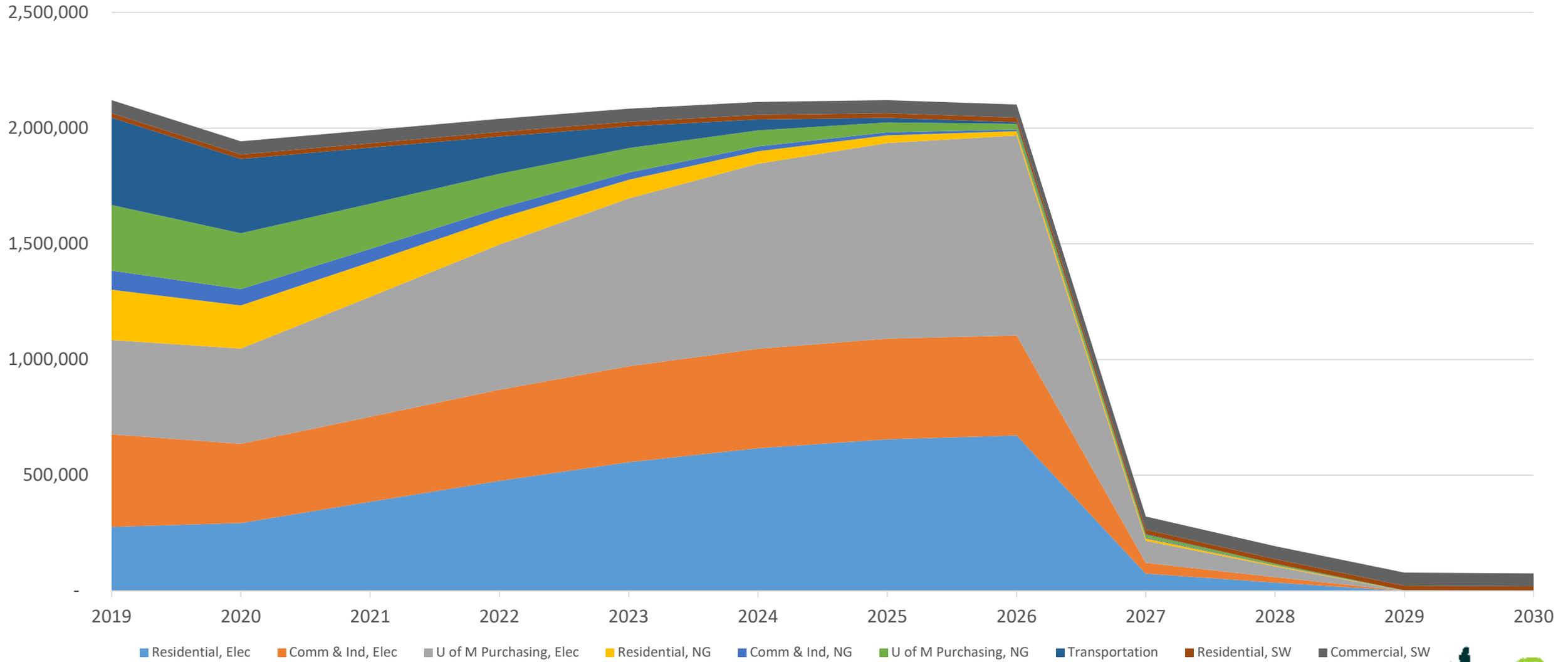


SUMMARY

Total Impact of Strategies, U-M Participation

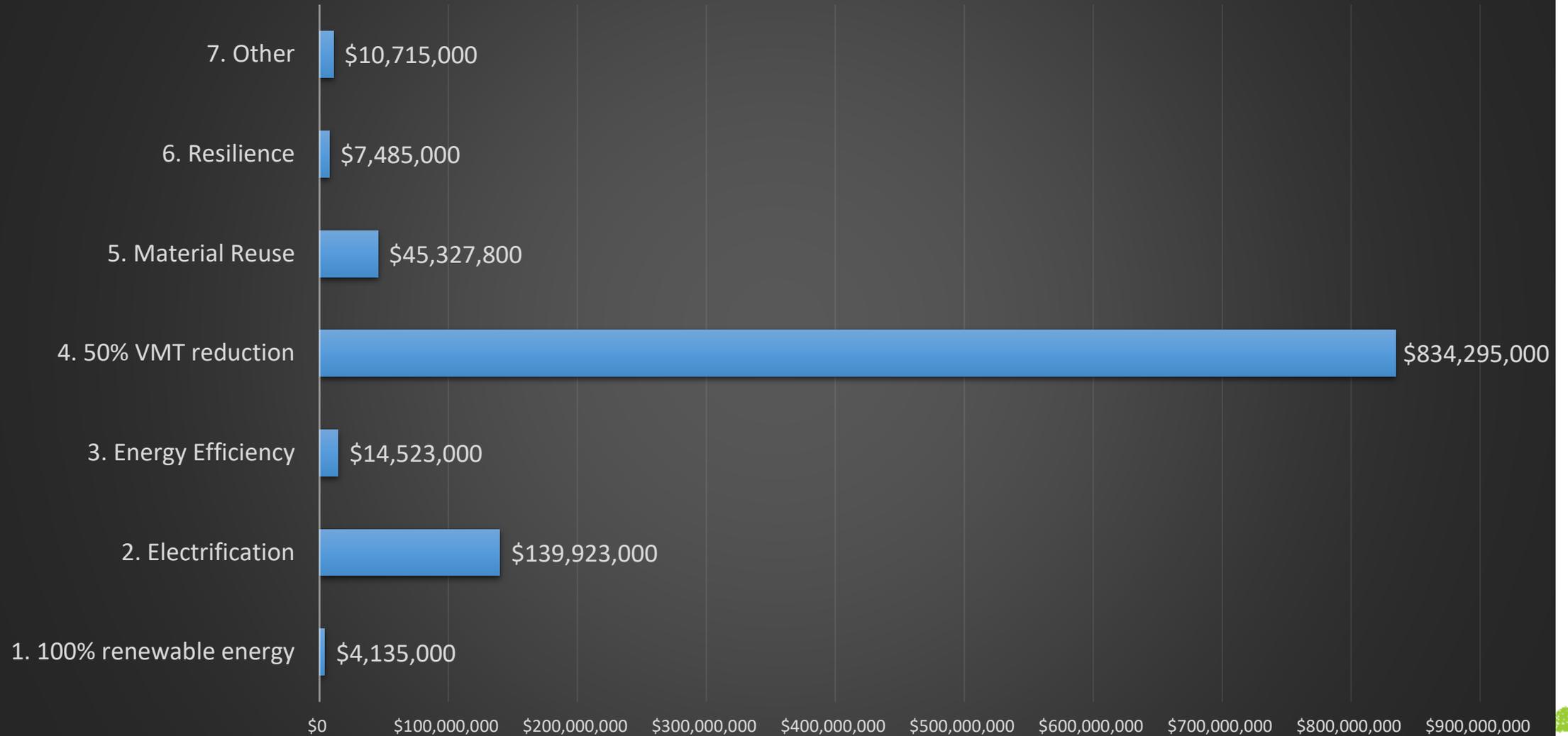


SUMMARY



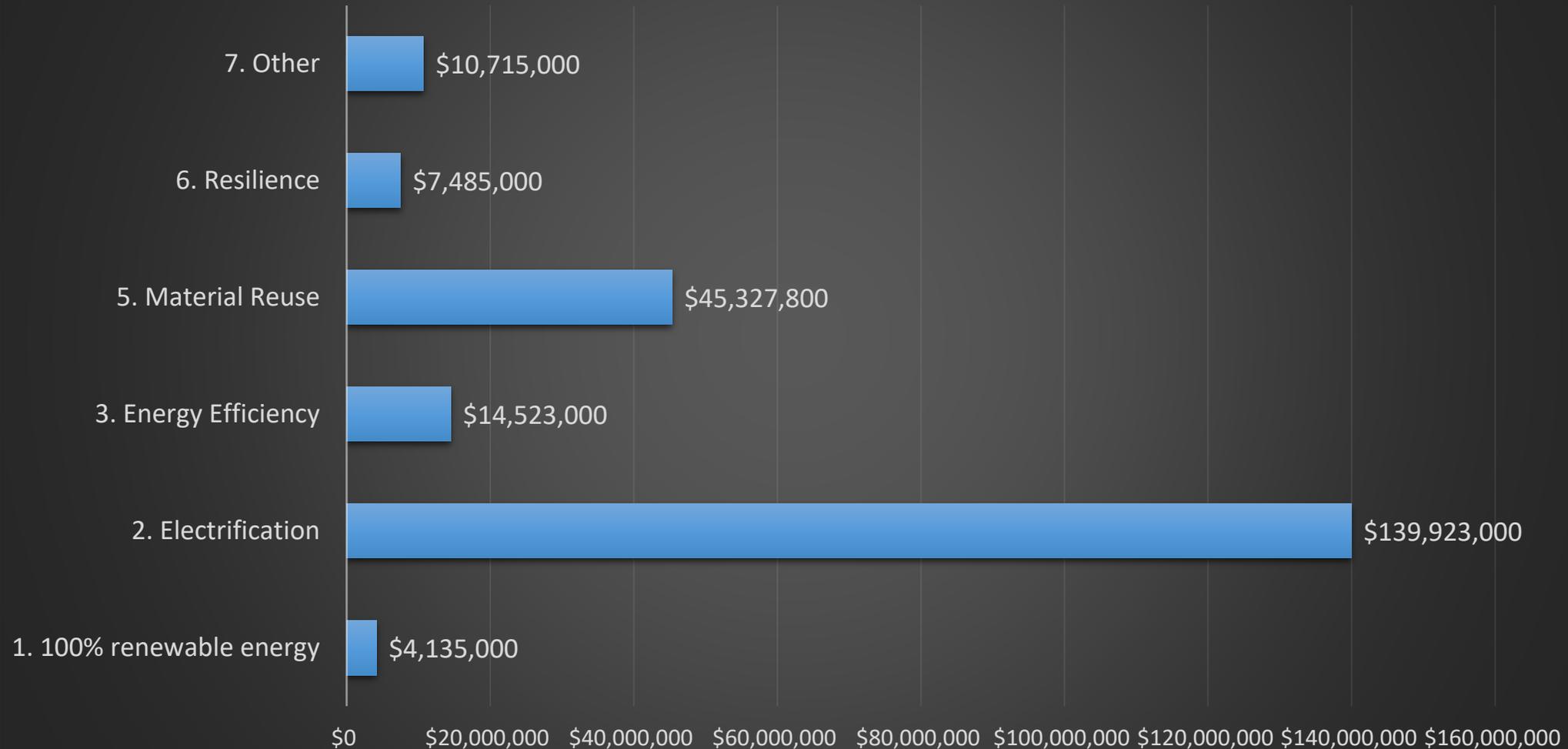
SUMMARY

Cost Per Strategy

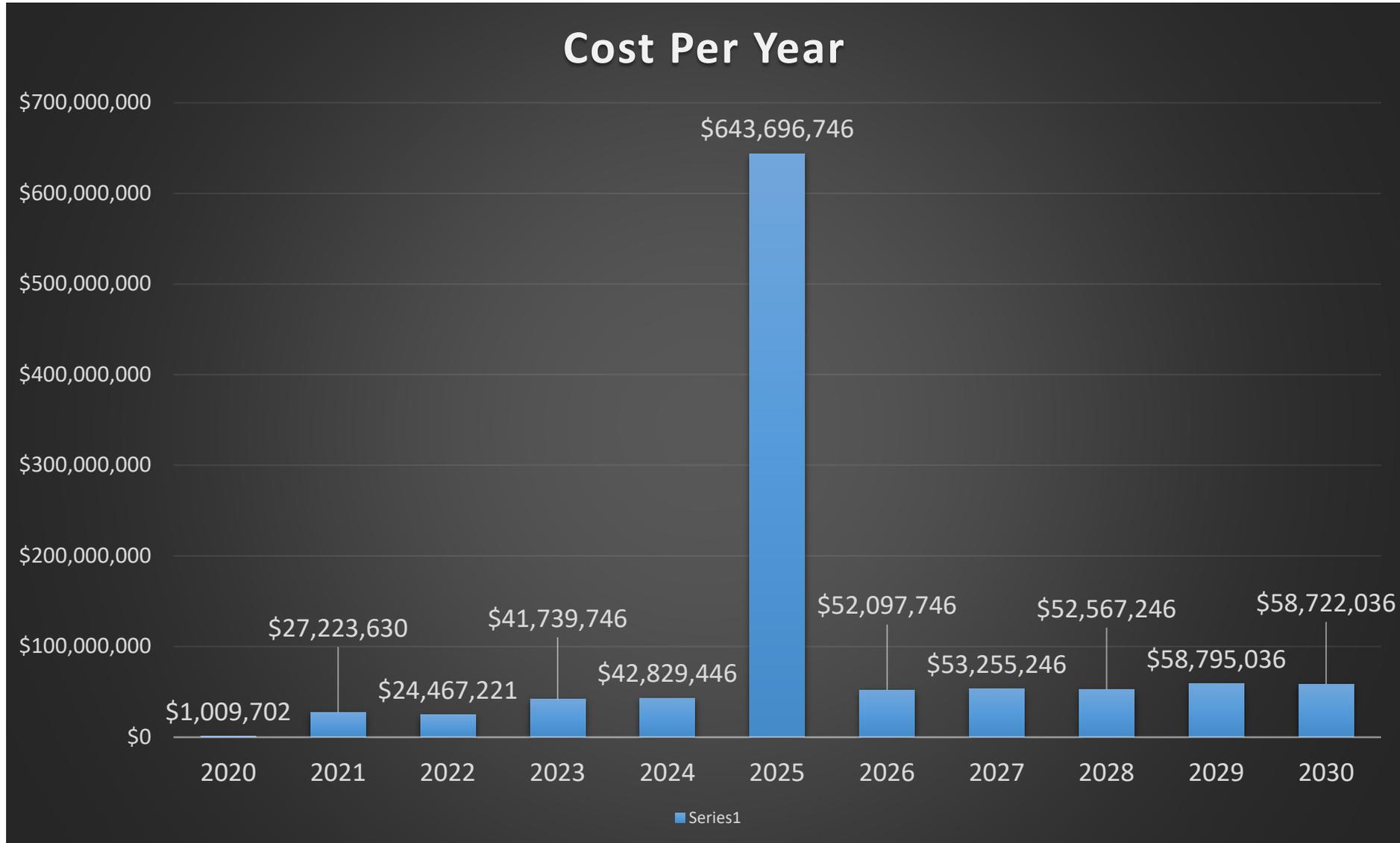


SUMMARY

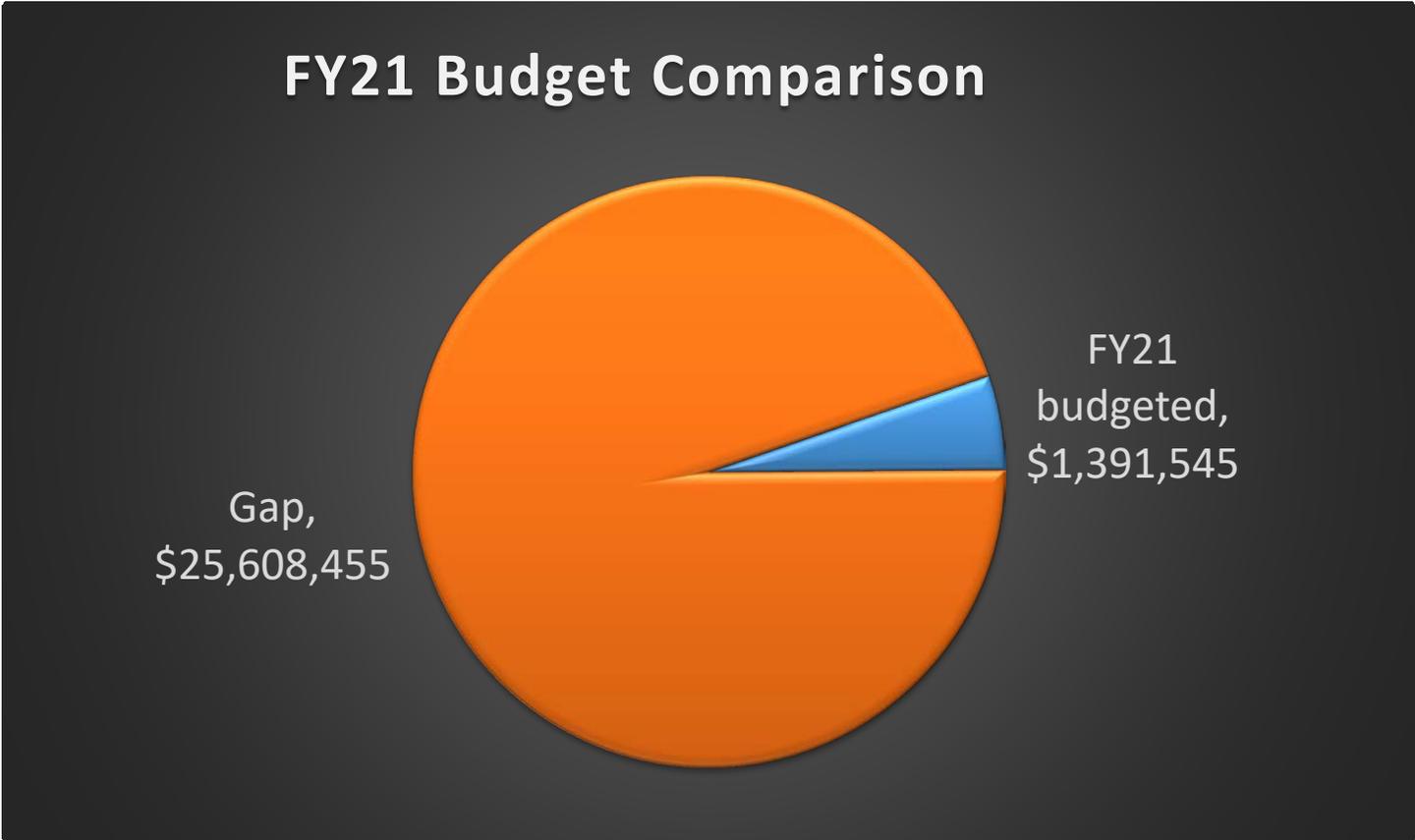
Cost Per Strategy w/o VMT



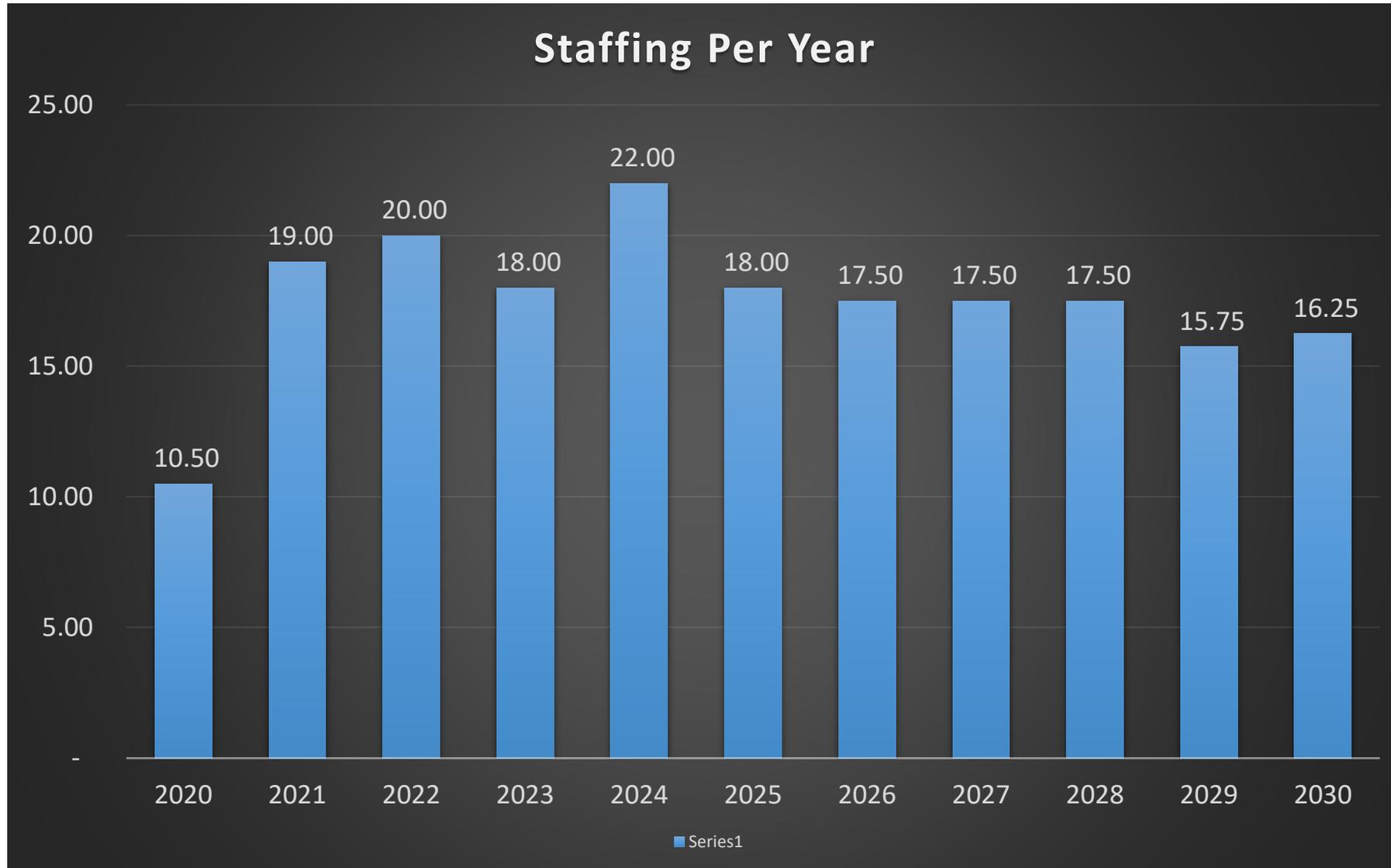
SUMMARY



FY21 Budget

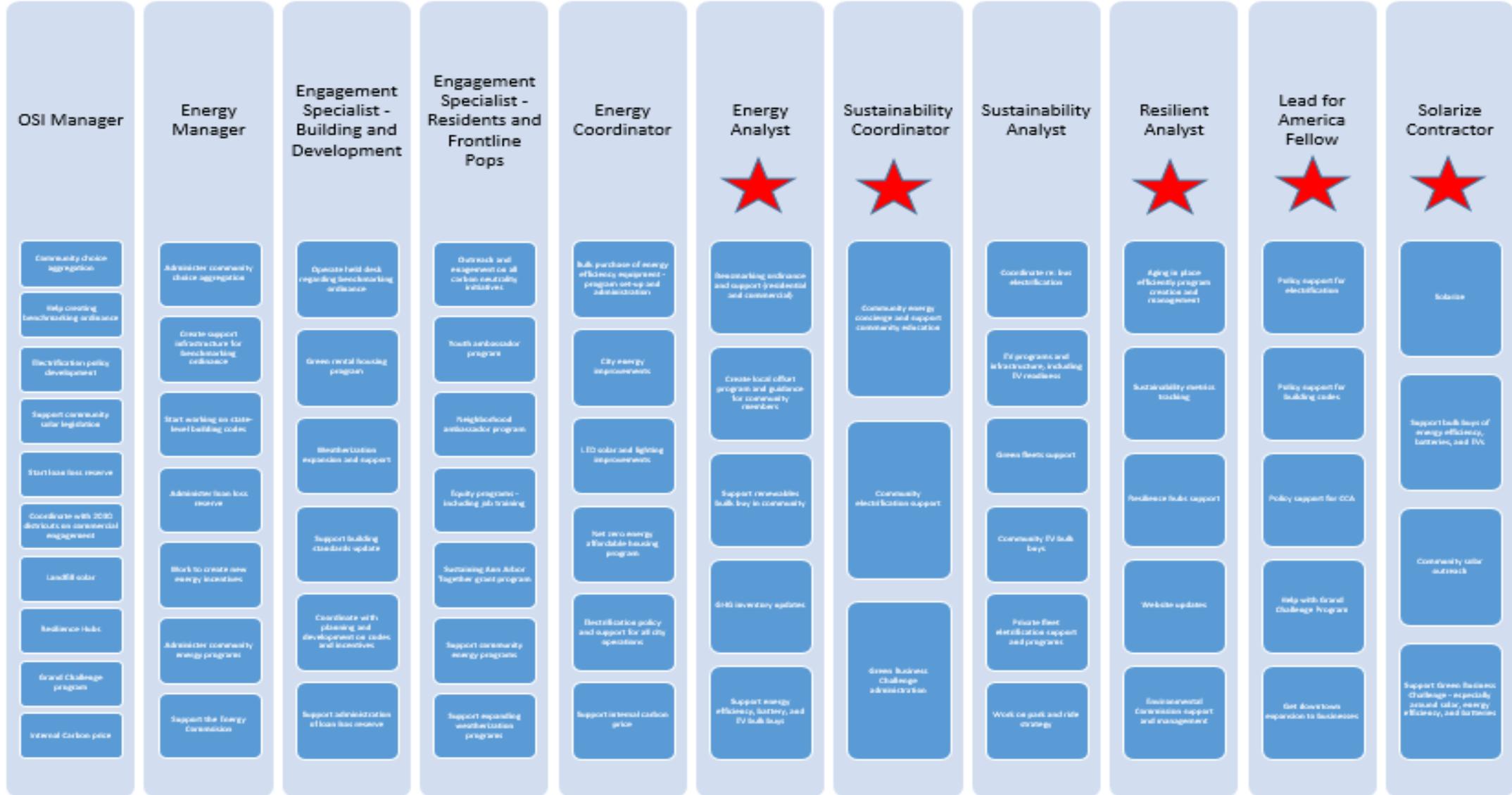


Staffing



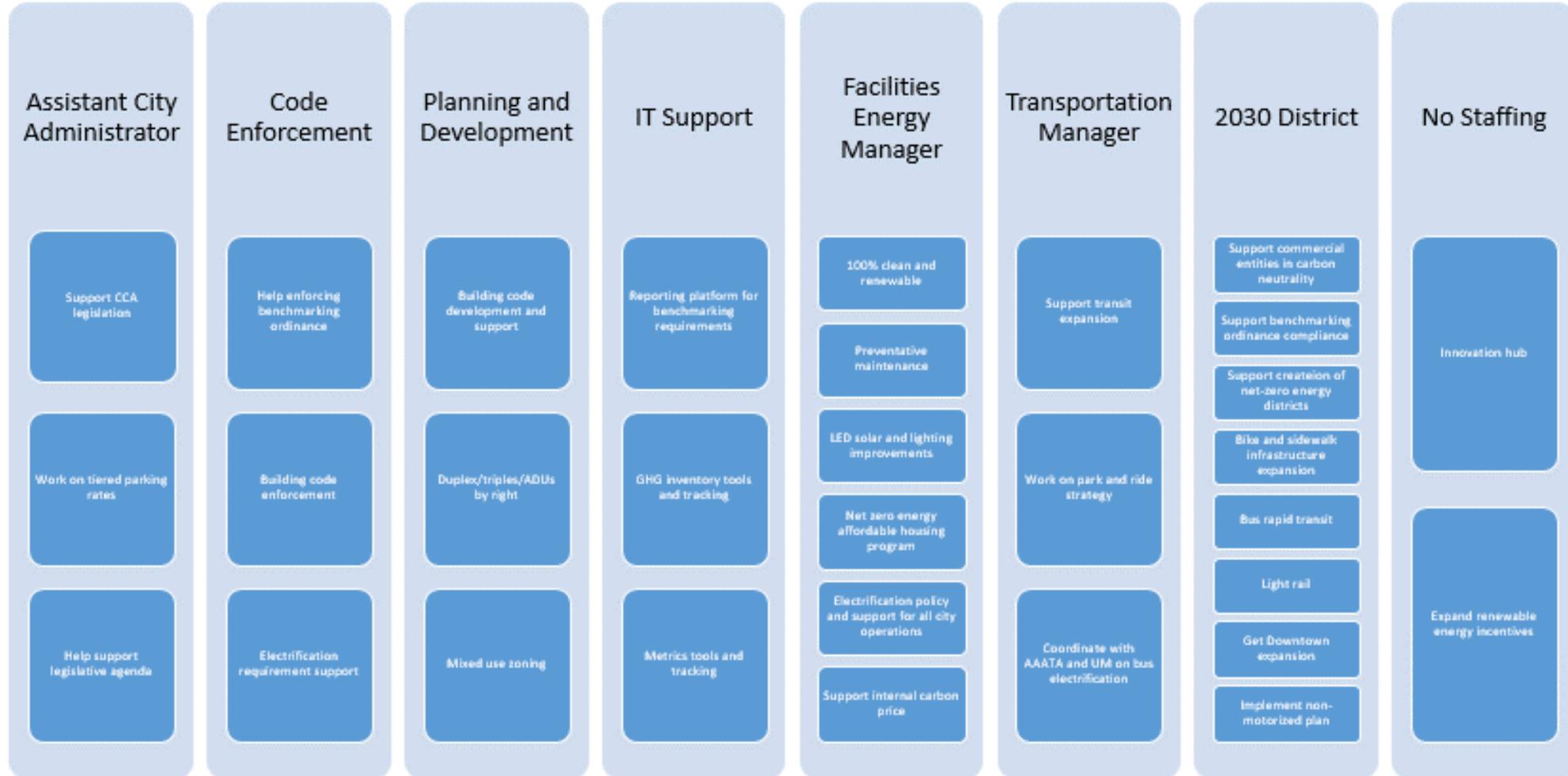
Staffing

Office of Sustainability and Innovations FY2021 Staffing Plan



The Budget

Office of Sustainability and Innovations FY2021 External Partner Plan



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



Thank You & Questions