A2ZERO

EQUITABLE • SUSTAINABLE • TRANSFORMATIVE



ANN ARBOR'S

LIVING CARBON NEUTRALITY PLAN

APRIL 2020

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WELCOME LETTER











Friends –

Even during the COVID-19 global pandemic, we face no greater threat than climate change.

It already affects us locally in the significant increase in precipitation falling on our community compared to previous years. We feel it in increasing temperatures and greater weather volatility. We see it in the spread of disease and infection. We know it's in disruptions to our supply chains, our agricultural systems, and our Great Lakes. We anticipate it in regard to the movement of people from vulnerable regions to areas with less susceptibility to climate disruption.

These existing and future changes will cause significant impacts to our public health, safety, general welfare, local economy, transportation networks, natural environments, and our overall quality of life. We cannot solve this crisis on our own, but in an era of national retreat, state and local communities must do their part. It is because of this that the Ann Arbor City Council unanimously declared a climate emergency and directed the City to immediately begin crafting an aggressive and living strategy to achieve community-wide carbon neutrality by 2030.

We recognize that this is an ambitious goal, but we know that Ann Arborites have the passion, intellect, creativity, and the compassion necessary to see it met. To be clear, achieving carbon neutrality within a decade will necessitate that we all work together. It will necessitate collaboration, innovation, and disruption. If we are to achieve our goal, Ann Arbor 2030 must be vastly different from Ann Arbor 2020.

As the following pages describe, carbon neutrality means that we must adopt new land use strategies and break our dependence on internal combustion engine vehicles. It means that we must power our homes, businesses, vehicles, and recreational sites with 100% renewable energy. It means that we must change the way we interact with materials and resources. It means that we must reinvest in our relationships with our vulnerable neighbors, elders, and youth. We must rethink an Ann Arbor that is open and accessible to all.

Every person -- every home owner, renter, student, visitor, community member, business owner, worker, youth, and elected leader has a significant role to play in achieving community-wide carbon neutrality. This living A^2Zero Carbon Neutrality Plan tells us what we need to do and begins to detail how we get there. Over the coming months and years, the City of Ann Arbor and our 60+ partner organizations will work with community members and stakeholders to get the job done. We hope that you will join us because together, we can achieve a rapid and equitable transition to community-wide carbon neutrality.

Sincerely,

Christopher Taylor
Mayor

EXECUTIVE SUMMARY



The global climate is changing and nowhere are the effects felt more acutely than at the local level. Moreover, the growing economic, social, political, environmental, and cultural impacts associated with a changing climate are causing immediate and long-term damages to our society, public health, safety, and our overall quality of life.

In light of these realities, on November 4th, 2019, Ann Arbor City Council unanimously adopted a Climate Emergency Declaration, stating that climate change is one of the most important issues of our time and that responding to the climate crisis necessitates a mobilization on par with those activated during times of disaster. In passing the resolution, the Council also committed to charting a path for how the entire Ann Arbor community could achieve carbon neutrality by the year 2030.

This is an ambitious goal, but one that aligns with the values and sentiments of Ann Arborites. Ann Arbor is a community of great strength, leadership, intellect, compassion, and ability. It is only by unlocking the full potential in all of these areas that we will be able to achieve carbon neutrality within the next decade.

This document outlines the path needed to achieve a just transition to carbon neutrality, community-wide, by the year 2030. This was created with input from thousands of Ann Arborites over the course of an intensive four month planning process. The result is this living A^{2}Zero Carbon Neutrality Plan which centers around six core strategies and one catch-all strategy:

1. Power our electrical grid with 100% renewable energy
2. Switch our appliances and vehicles from gasoline, diesel, propane, coal, and natural gas to electric
3. Significantly improve the energy efficiency in our homes, businesses, schools, places of worship, recreational sites, and government facilities
4. Reduce the miles we travel in our vehicles by at least 50%
5. Change the way we use, reuse, and dispose of materials
6. Enhance the resilience of our people and our place
7. Other

Forty-four actions have been identified to fully implement these seven strategies. Each of these actions is outlined in the following pages. Combined, these actions get us to carbon neutrality, based on our current greenhouse gas emissions profile. By necessity, this Plan is considered living since many things, can and likely will, change in the coming years.

To achieve carbon neutrality, the entire Ann Arbor community must eliminate 2.1 million metric tons of carbon dioxide equivalent emissions annually – this is the quantity of greenhouse gas emissions we emitted, as an entire community, in 2018. Although the City recognizes the importance of upstream and embedded emissions, this figure does not include emissions associated with the production of the goods and services Ann Arborites

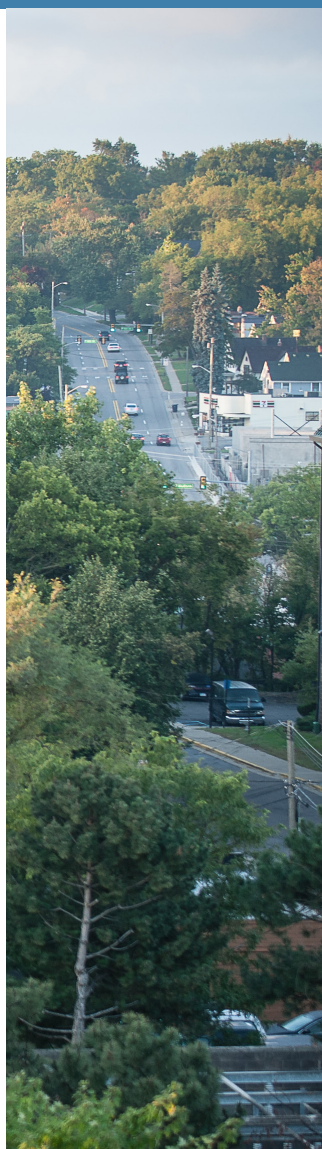
use. As the science and policy around carbon neutrality grows, we will continue to look for and contribute to methodologies to calculate community-wide upstream and embedded emissions in future inventories.

For now, this Plan focuses on eliminating the 2.1 million metric tons of carbon dioxide equivalent that primarily come from natural gas, electricity, gasoline, coal, and diesel used by residents, visitors, students, and businesses in Ann Arbor. Importantly, the seven overarching strategies proposed in this Plan are intrinsically linked. This means that care was taken to understand how given actions work together to achieve carbon neutrality. This also means that removing one action from consideration has a more significant impact than is denoted on any one given actions' summary page. As such, caution should be taken before removing any given action from consideration without fully understanding how it interacts with and informs other actions proposed in this Plan.

Where available, cost estimates are also provided for each action in the Plan. These cost estimates integrate soft, physical, and human capital costs associated with various actions. All costs estimated are incremental, meaning that the dollars allocated for each action are additional to resources, if relevant, already supporting a given action. In our analysis, the value of externalities was often calculated for information purposes. We did not, however, include those values in each individual cost calculation.

Additionally, we have identified an array of co-benefits associated with each action in the Plan. In total, 10 co-benefits were identified, including:

- **Supports local economy**
- **Improves public health**
- **Produces local energy**
- **Cost savings accrued**
- **Improves air quality**
- **Supports biodiversity preservation**
- **Creates jobs and/or develops workforce**
- **Benefits the most vulnerable**
- **Improves local resilience**
- **Scalable or transferable to other communities**



EXECUTIVE SUMMARY

Combined, the seven overarching strategies and accompanying 44 actions outlined in this Plan are projected to reduce emissions by 2.1 million metric tons of carbon dioxide equivalent and cost just over $1 billion additional dollars over the next ten years (Figure ES-1; ES-2; and ES-3). As we move forward with implementation, we will make tough decisions about how to fund and finance the actions outlined in this Plan.

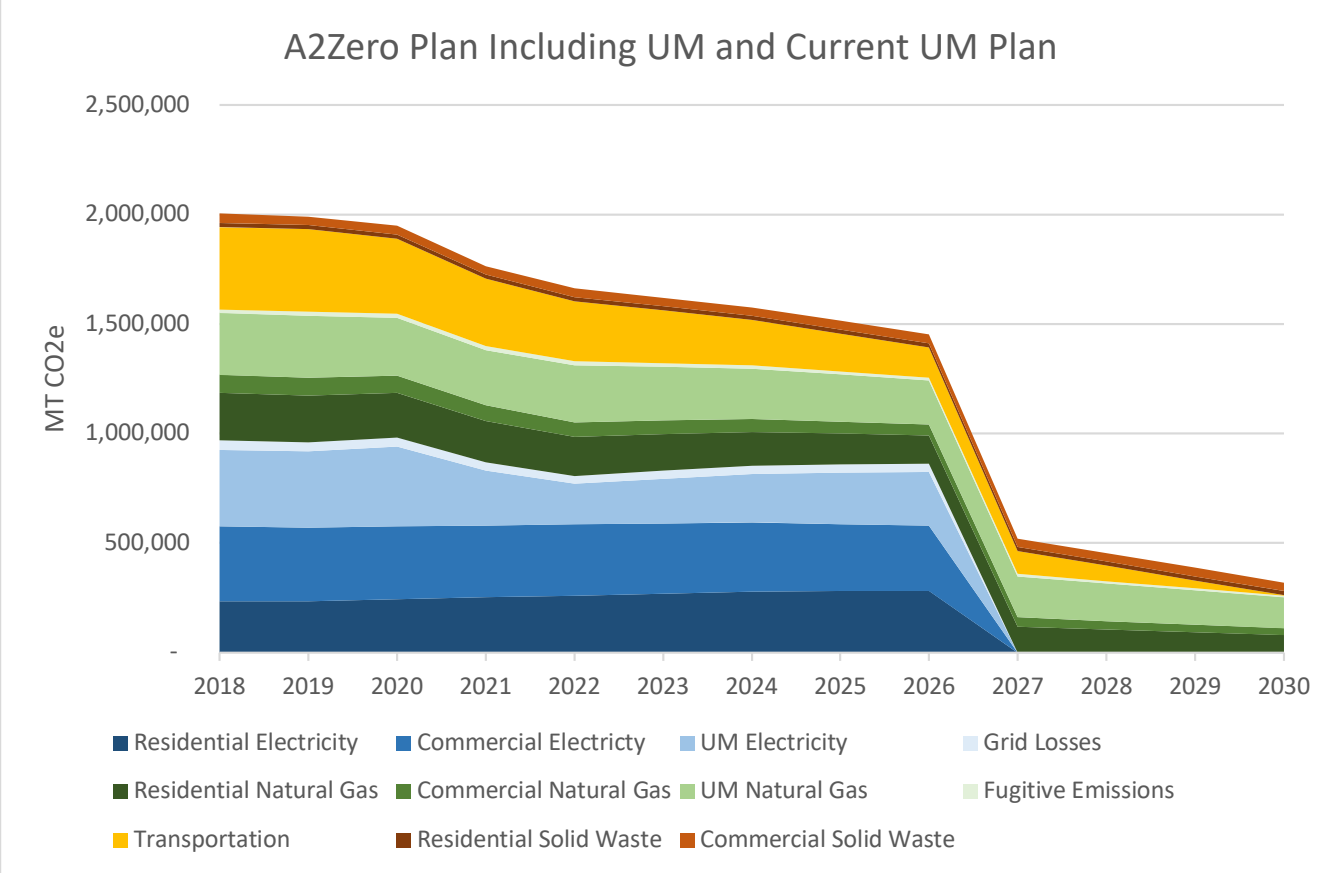


Figure 1: A "Win Scenario" outlining one possible path towards achieving carbon neutrality by 2030. The actions outlined in this Plan are centered on achieving this "win scenario". This "win scenario" assumes that the University of Michigan mirrors the actions of the City.



However, the University is currently undertaking their own carbon neutrality planning process so these assumptions will change once more information is available. Overall, this Plan is considered living and iterative, meaning that changes to this "win scenario" will be necessary over time.

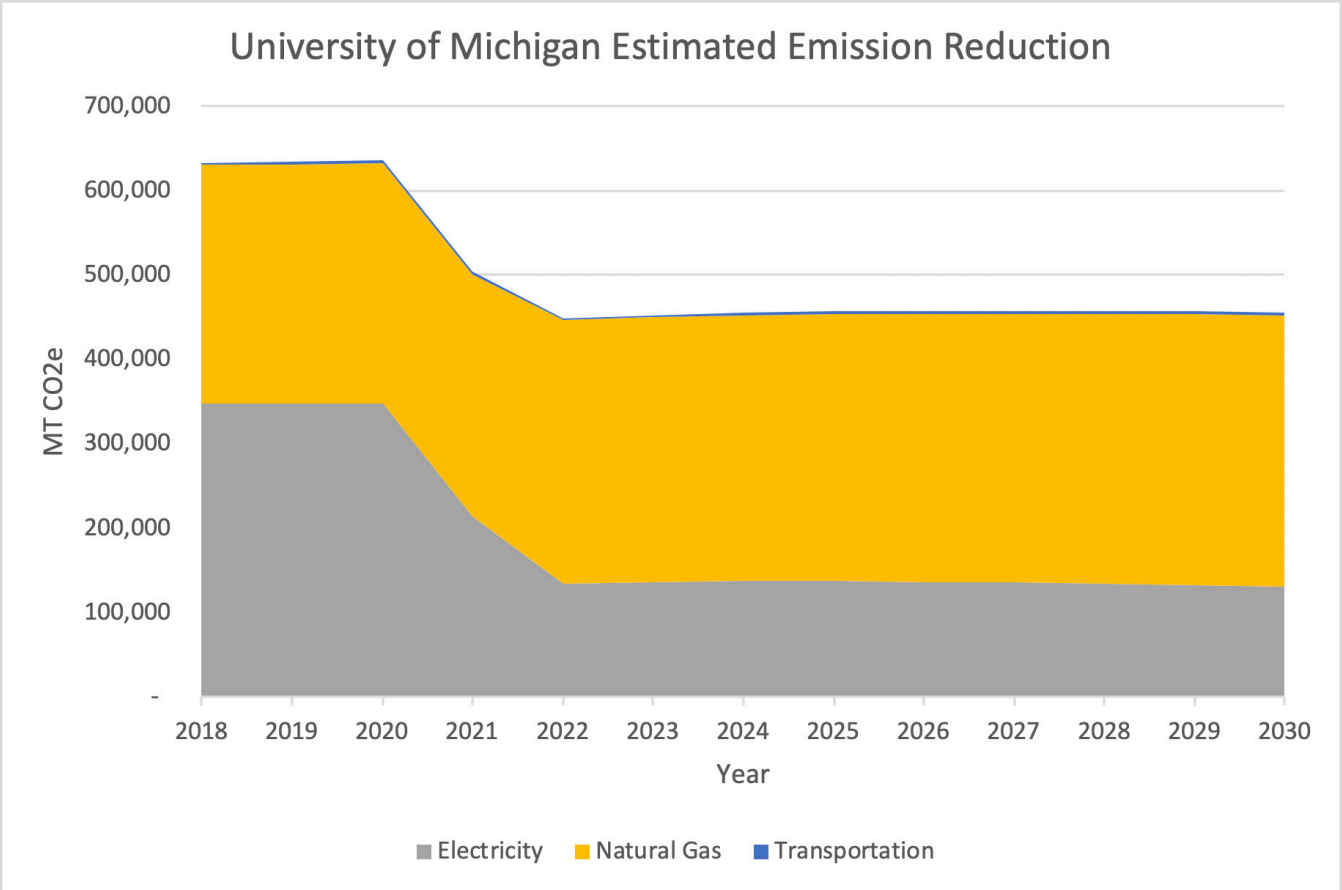


Figure 2: Summary of the University of Michigan's current strategies to reduce their emissions over the next two years. The University of Michigan is currently developing recommendations to achieve carbon neutrality by an undetermined date. Since the University's Plan was not finalized by the time the City's Plan was drafted, their participation in the actions outlined in this Plan was modeled. An update will be provided to this Plan once the University has formally adopted a path towards carbon neutrality. For now, this graph shows the University's currently projected emissions reduction activities.

One of the most pressing first steps in implementing this strategy is ensuring we have the human capital needed to immediately begin taking action. Models run as part of this analysis showed that a minimum staffing of 15 full time equivalent employees are needed, combined with a varying number of consultants, to fully implement this Plan. Not surprisingly, the more physical staff that are focused on the Plan, the more likely the Plan is to succeed. As such, decisions will need to be made not only about how best to fund the actions outlined in this Plan, but how best to build the human capital needed to design and support implementation of the Plan. Guiding this work as a living A^{2}Zero Investment Plan, A^{2}Zero Prioritization Framework, and an A^{2}Zero Governance Model.

Achieving a just transition to carbon neutrality, community-wide, by the year 2030 is audacious, ambitious, and inspirational. This Plan outlines a concrete path for how we can immediately make progress towards that goal. Time is of the essence if Ann Arbor is to seriously achieve this goal. From the engagement we've already seen with A^{2}Zero, we know City employees, partner organizations, technical advisors, neighborhoods associations, businesses, and members of the public stand ready to take this audacious goal and turn it into a reality. The time to start is now.

ACTION SUMMARY TABLE

STRATEGY 1	Total Costs	GHG Reduction	%total emissions	$/ton	Co-Benefits
Community Choice Aggregation	$3,245,000	784,000	35.8%	$4	AIR; $$; EQU; SCALE
Bulk Purchase of Renewables	$605,000	85,000	3.9%	$7	LOCAL; NRG; AIR; JOBS; RES; $$; SCALE
Community Solar Program	$205,000	11,500	0.5%	$18	LOCAL; NRG; AIR; JOBS; RES; $$; EQU; SCALE
Landfill Solar Project	$80,000	23,000	1.1%	$3.5	LOCAL; NRG; AIR; SCALE
STRATEGY 2	**Total Costs**	**GHG Reduction**	**%total emissions**	**$/ton**	**Co-Benefits**
Home & Business Electrification	$7,100,000	362,200	16.5%	$ 20	LOCAL; AIR; JOBS; HEALTH; SCALE
Bus Electrification	$80,575,000	13,800	0.6%	$ 5,839	LOCAL; AIR; RES; HEALTH; EQU
Bulk Purchase EVs	$700,000	122,900	5.6%	$6	AIR; JOBS; RES; HEALTH; $$; SCALE
Private EV Fleets	$123,000	0	0.0%		AIR; RES; $$; HEALTH; SCALE
City EV Fleet	$4,000,000	1,100	0.1%	$3,636	AIR; JOBS; RES; HEALTH; $$; SCALE
EV Infrastructure	$42,000,000	0	0.0%		AIR; JOBS; HEALTH; SCALE
STRATEGY 3	**Total Costs**	**GHG Reduction**	**%total emissions**	**$/ton**	**Co-Benefits**
Bulk Purchase of Energy Efficiency	$7,100,000	242,500	16.5%	$ 4	LOCAL; AIR; JOBS; HEALTH; $$; EQU; SCALE
Building Code Requirements	$80,575,000	48,300	0.6%	$ 40	LOCAL; JOBS; RES; $$; EQU; SCALE
LED Lighting	$700,000	2,600	5.6%	$1,208	AIR; $$
Benchmarking	$123,000	0	0.0%		JOBS; $$; SCALE
Loan Loss Reserve	$4,000,000	0	0.0%		LOCAL; JOBS; RES; HEALTH; $$; EQU; SCALE
Energy Concierge & Community Education	$42,000,000	0	0.0%		JOBS; $$; EQU; SCALE
Net Zero Energy Affordable Housing	$800,000	400	0.0%	$2,000	LOCAL; NRG; AIR; JOBS; RES; HEALTH; $$; EQU
Green Rental Housing Program	$530,000	0	0.0%		LOCAL; AIR; JOBS; RES; HEALTH; $$; EQU; SCALE
Green Business Challenge	$700,000	0	0.0%		LOCAL; NRG; AIR; JOBS; RES; $$; SCALE
Aging in Place Efficiently	$150,000	0	0.0%		LOCAL; JOBS; RES; HEALTH; $$; EQU
Weatherization Expansion	$1,550,000	0	0.0%		LOCAL; JOBS; RES; HEALTH; $$; EQU

KEY					
EQU	Benefits the most vulnerable	RES	Improve local resilience	LOCAL	Local energy Production
COST	Cost savings accrued	HEALTH	Improves Public Health	ENV	Supports biodiversity preservation
$$	Dollars stay in the local economy	SCALE	Is scalable or transferable to other communities		
AIR	Improve air quality	JOBS	Job creation and/or work force training		

ACTION SUMMARY TABLE

STRATEGY 4	Total Costs	GHG Reduction	%total emissions	$/ton	Co-Benefits
Non-Motorized Plan	$3,245,000	60,400	2.8%	$40	AIR; RES; HEALTH; $$; EQU
Local and Regional Transit	$605,000	93,200	4.3%	$7047	LOCAL; AIR; JOBS; RES; HEALTH; $$; EQU
Park and Ride	$205,000	28,400	1.3%	$5,986	AIR; EQU; SCALE
Duplex/Triplex/ADUs	$80,000	2,200	0.1%	$114	LOCAL; AIR; RES; SCALE
Mixed-Use Zoning	$365,000	0	0.0%		LOCAL; AIR; RES; HEALTH
Parking Rates	$4,500,000	0	0.0%		LOCAL; AIR
STRATEGY 5	**Total Costs**	**GHG Reduction**	**%total emissions**	**$/ton**	**Co-Benefits**
Year Round Composting	$26,000,000	400	0.1%	$65,000	LOCAL; NAT; JOBS; SCALE
Commercial Recycling	$18,400,000	5,600	0.3%	$3,286	JOBS; SCALE
Sustainable Material Use and Reuse	$270,000	0	0.0%		LOCAL; ERS: HEALTH; $$; NAT; EQU
Circular Economy	$270,000	0	0.0%		LOCAL; JOBS; RES; HEALTH; $$; NAT
Plant-Based Diets	$208,400	0	0.0%		HEALTH; NAT
Refrigerant Recycling	$179,400	0	0.0%		JOBS; HEALTH
STRATEGY 6	**Total Costs**	**GHG Reduction**	**%total emissions**	**$/ton**	**Co-Benefits**
Resilience Hubs	$5,025,000	2,500	0.1%	$2,010	LOCAL; NRG; RES; HEALTH; EQU; SCALE
Neighborhood & Youth Ambassadors	$350,000	0	0.0%		LOCAL; JOBS; RES; HEALTH; EQU; SCALE
Tree Canopy	$1,160,000	450	0.0%	$2,578	AIR; RES; HEALTH; NAT; EQU; SCALE
Neighborhood Asset Mapping	$300,000	0	0.0%		LOCAL; RES: EQU; SCALE
Emergency Kits	$350,000	0	0.0%		RES; HEALTH; EQU; SCALE
Sensors and Data Monitoring	$300,000	0	0.0%		RES; HEALTH; $$; NAT; EQU; SCALE
STRATEGY 7	**Total Costs**	**GHG Reduction**	**%total emissions**	**$/ton**	**Co-Benefits**
Equity Programs	$200,000	0	0.1%		LOCAL; RES; EQU
SA2T Grant Program	$1,000,000	0	0.0%		LOCAL; RES
Internal Carbon Tax	$75,000	0	0.0%		LOCAL; NRG; RES; $$; SCALE
Offsets	$9,440 ,000	298,500	13.6%	$32	SCALE
	Total	**$1,056,403,800**	**2,188,950**	**100.0%**	

Figure 3: Summary of Strategies, Actions, Cost, and Co-Benefits for Proposed Actions in the A²Zero Plan.

INTRODUCTION

In November 2019, Ann Arbor City Council passed Resolution 19-2103: A Resolution in Support of Creating a plan to Achieve Ann Arbor Community-Wide Carbon Neutrality by 2030. In this Resolution, City Council called on the City to work with the public to create a living plan for achieving carbon neutrality, and to present that plan by Earth Day 2020.

To initiate this work, the Office of Sustainability and Innovations launched A^{2}Zero: the City's carbon neutrality planning and implementation initiative. From the outset, A^{2}Zero was designed to be iterative, transparent, failure-positive, and grounded in justice and equity. A^{2}Zero was crafted so as to have extensive and broad public input and engagement, to be technically robust, to be visionary, and to be inclusive.

Achieving a just transition to carbon neutrality, community-wide, by 2030 will necessitate action from all members of our community. It will necessitate some subtle as well as some significant changes to our community. Not everyone will be excited about every change. But we know the goal – carbon neutrality – is a scientific imperative and one that Ann Arborites are ready to embrace.

But what does carbon neutrality mean? Simply defined, carbon neutrality is reducing the emissions our community puts into the air down to zero, through actions that minimize output and/or by purchasing greenhouse gas emissions offsets. Ann Arbor regularly conducts a greenhouse gas emissions inventory to track our emissions. From this, we know that community-wide emissions, as of 2018, were 2.1 million metrics tons (Figure 4). This means that we have to devise a plan to reduce emissions by 2.1 million metric tons over the next 10 years.

Simultaneously, we need to ensure that we continue preparing our community for the impacts of climate change that are already here, as well as those projected to come. For example, we already know that:

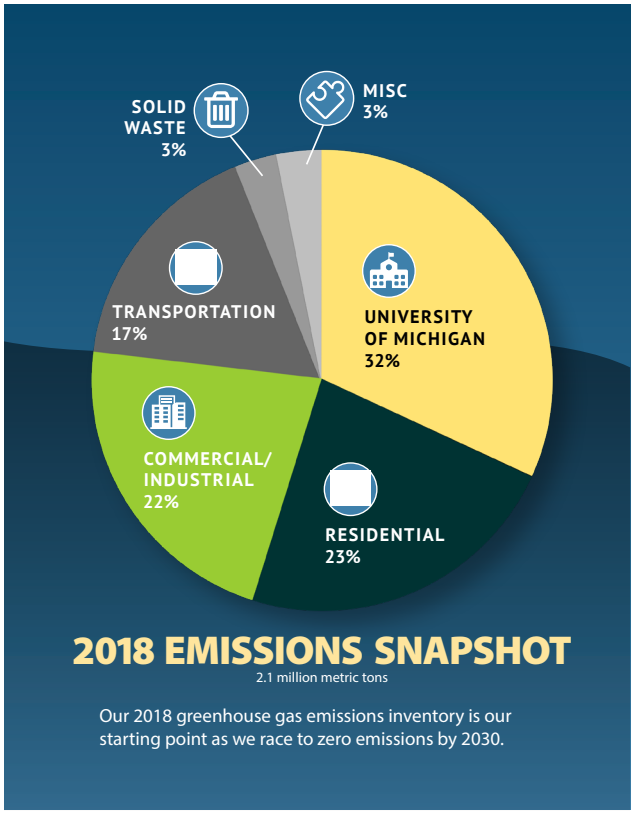


Figure 4: 2018 Greenhouse Gas Emissions by Sector.

- The average annual temperature in Ann Arbor has already increased nearly 1°F since the 1900s. And temperatures are expected to rise by 3-7°F more by 2050.
- Ann Arbor is projected to have 12-36 more days per year above 90°F by 2050 and 30-42 more by end of the century.
- Average annual precipitation has increased by 44% since the 1950s and continues to rise.
- The total amount of rain falling during extreme events has increased by 37% since 1981.

Given these realities, A^{2}Zero was designed to develop actions that change how we manage the unavoidable impacts of climate change by ensuring we invest in the resilience of our people and place, while avoiding the unmanageable impacts of climate change by doubling down on our efforts to reduce greenhouse gas emissions in an effective and timely manner. And, at the core of all of this work is equity; ensuring that our work does not disproportionately burden our low-income, minority, and frontline populations (Figure 5). This is A^{2}Zero.

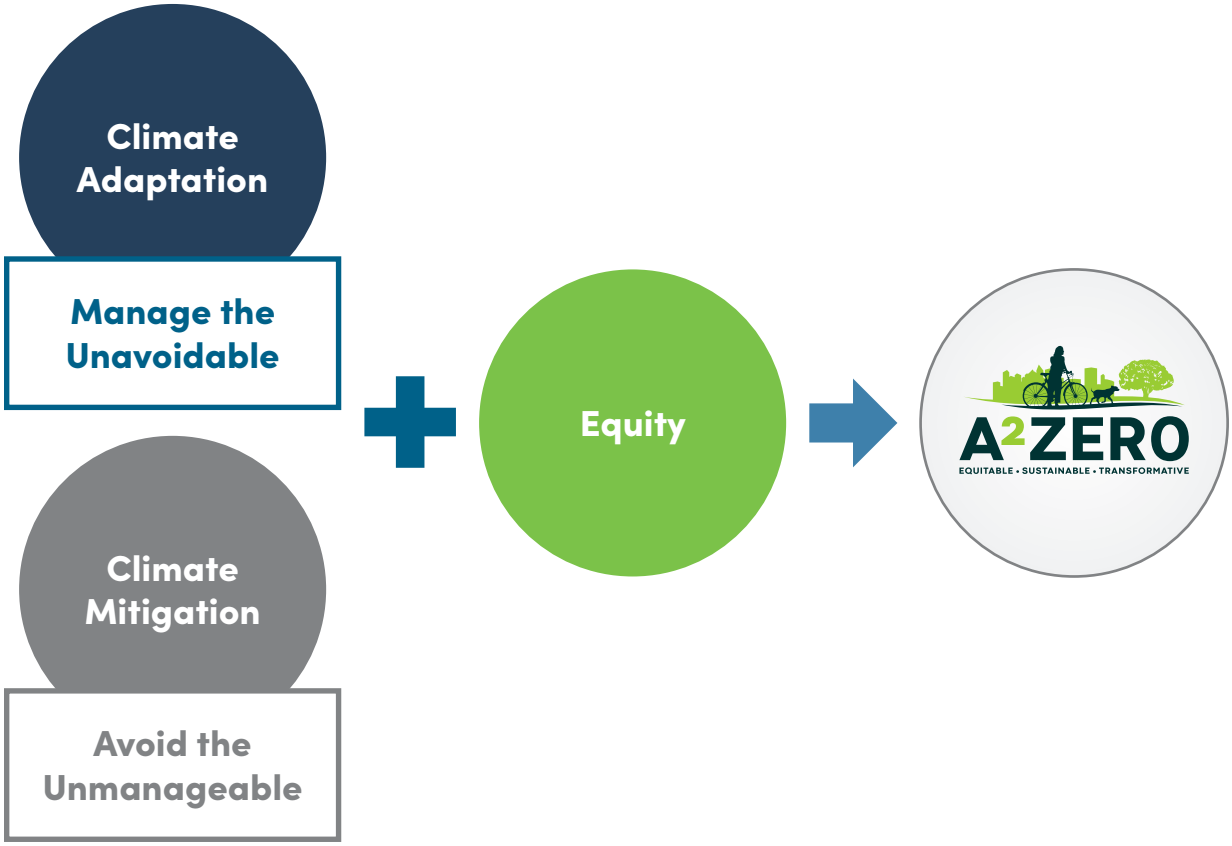


Figure 5: The Core Components of A²Zero.

A²ZERO VALUES

Three overarching values are fundamental to and guide the A²Zero initiative: Equity, Sustainability, and Transformation. The table below highlights what each of these values mean and what characteristics were applied to integrate these values into the A²Zero.

	Equity / Equitable	Sustainability / Sustainable	Transformation / Transformative
Definition	Ensuring everyone gets what they need to succeed based on where they are and where they need to go.	Capable of enduring, able to be sustained in perpetuity. Meeting the needs of the present without jeopardizing the ability of future generations to meet their own needs.	Causing a major change to something or someone, especially in a way that makes it or them better.
Characteristics	• Transparent • Community-Led • Inclusive • Prioritizes Frontline Populations	• Living / Iterative • Holistic	• Failure-Positive • Diversified • Accessible to All

A²ZERO MISSION

The A²Zero mission is the same as the City of Ann Arbor's mission: deliver exceptional services that sustain and enhance a vibrant, safe, and diverse community.

A²ZERO VISION

A²Zero strives toward one unifying vision: Together, creating and implementing a just transition to carbon neutrality, community-wide, by the year 2030. This vision guides all things related to A²Zero.



A²ZERO STRATEGY

Combing the A²Zero values, mission, and vision allowed us to land on seven overarching strategies that are essential to and make up the backbone of the A²Zero Carbon Neutrality Plan:

1. Power our electrical grid with 100% renewable energy
2. Switch our appliances and vehicles from gasoline, diesel, propane, coal, and natural gas to electric
3. Significantly improve the energy efficiency in our homes, businesses, schools, places of worship, recreational sites, and government facilities
4. Reduce the miles we travel in our vehicles by at least 50%
5. Change the way we use, reuse, and dispose of materials
6. Enhance the resilience of our people and our place
7. Other

Public input, guidance from technical advisory committees and peer communities, combined with staff expertise determined that 44 specific actions were needed to fully achieve the seven strategies outlined above. The majority of this Plan outlines these specific actions and how we, as a community, can immediately get started working towards carbon neutrality.

A²ZERO PLANNING PROCESS

Ann Arbor has been working on climate action since the early 2000s. A²Zero builds upon nearly two decades of planning, action, and local leadership. The City initiated A²Zero on November 13th, 2019 with a deadline of plan completion by mid-March 2020 - an incredibly accelerated, four-month creation period. What's unique about this Plan is the urgency and speed with which this Plan was created. In this four month period, the Ann Arbor Office of Sustainability and Innovations mobilized dozens of community partners and volunteers, thousands of members of the public, dozens of technical advisors, and peer communities to provide input into this Plan.

THE PROCESS



82 working days:

- 3 Public surveys
- Over 60 public events
- 2 large town halls
- Over 80 technical advisors
- 66 partner organizations

Figure 6: The A²Zero Planning Process. The process involved three phases, four main sources of input (including technical documents and the peer reviewed literature), over 60 public events, more than 80 technical advisors, three public surveys, and support from over 60 organizations.

This reminder of this section provides detail on the planning processes undertaken to arrive at this living A²Zero Carbon Neutrality Plan.

A²ZERO'S FIVE PILLARS OF PLANNING

To complete a holistic, comprehensive, and realistic carbon neutrality plan, the Office of Sustainability and Innovations designed a planning process that rests on five pillars:

1. Public Engagement
2. Technical Advisory Committees
3. Partner Support
4. Staff Expertise
5. Peer Learning and Literature Review

PUBLIC ENGAGEMENT

Public engagement is at the heart of A²Zero. Three primary means of public engagement were undertaken in order to create this Plan: 1) public events; 2) public surveys; and 3) regular communication via traditional means and social media. In terms of public events, staff in the Office of Sustainability and Innovations hosted 68 public events between November 13th, 2019 and March 12th, 2020 (Appendix 1). Public events focused on engaging underrepresented constituencies and leveraging partner networks to reach as wide of a swath of the community as possible. Partner organizations also encouraged to their members to take the three surveys as part of the planning process. Finally, the City leveraged its social media channels and partner networks to let people know about events, opportunities for feedback, and to share general information about the A²Zero initiative.

Three public surveys were administered as part of A²Zero:

Survey 1: Gathered ideas from the public about what they would like to see in the City's carbon neutrality work.

Survey 2: Collected feedback on which ideas the public supported to reduce greenhouse gas emissions as well as how the City should fund carbon neutrality efforts.

Survey 3: Focused on identifying what stakeholders need to support implementation of the final carbon neutrality strategy.

TECHNICAL ADVISORY COMMITTEES

Technical advisory committees (TACs) were established to ensure that experts within the community could help identify what would technically be needed to achieve carbon neutrality. Four TACs were established: 1) energy; 2) mobility; 3) resource reduction; and 4) adaptation and resilience. Over 80 individuals volunteered their time as technical advisors on at least one of the four committees. Technical advisors helped identify potential actions, evaluate actions (including those recommended by the public), and create a prioritized list of candidate strategies for potential inclusion in the final Plan (see Appendix 2 for TAC meetings).

PARTNER ORGANIZATIONS

To support outreach and engagement, as well as the eventual implementation of the A²Zero, the Office of Sustainability and Innovations sought partner organizations. Partner organizations had to agree to co-host a carbon neutrality event with the Office, share information about the initiative with their membership/networks, and to share their logo on partner messaging materials. As of early March 2020, 67 organizations had signed up to be partners of A²Zero, including:

Every month, from December – March, a partner messaging kit was developed and circulated to make it easy for partners to share updates about A²Zero with their networks.

The National Wildlife Federation; The Neutral Zone; Community Action Network; Citizens Climate Lobby - Ann Arbor; The Ecology Center; The Ann Arbor 2030 District; Interfaith Council for Peace and Justice; Michigan Environmental Council; Washtenaw 350; Ann Arbor Area Elders Climate Action Chapter; The American Institute of Architects Huron Valley Chapter; The University of Michigan; Washtenaw Climate Reality; Building Matters Ann Arbor; Michigan League of Conservation Voters; Sierra Club Huron Valley Group; A2 Climate Mobilization; Leslie Science and Nature Center; The Hands on Museum; Michigan Climate Action Network; Ann Arbor/Ypsilanti Regional Chamber; Ann Arbor Housing Commission; THRIVE Collaborative; Michigan Interfaith Power and Light; Washtenaw County Democrats; American Society of Adaptation Professionals; Washtenaw Bicycling and Walking Coalition; Colonial Square Cooperative; Walker Miller Energy Services; United Way of Washtenaw County; Lean and Green Michigan; Washtenaw Housing Alliance; Citizens Climate Lobby - UM Chapter; Forest Hills Cooperative; Ann Arbor Meals on Wheels; International Brotherhood of Electrical Workers Local 252; Ann Arbor Center for Independent Living; UM College Democrats; Students for Clean Energy; Great Lakes Renewable Energy Association; UM Climate Action Movement; Washtenaw Area Apartment Association; Washtenaw County; The Ride;

Ann Arbor SPARK; National Association for the Advancement of Colored People-Ann Arbor Chapter; Ann Arbor Public Schools; Ann Arbor Indivisible; University of Michigan President's Commission on Carbon Neutrality; Washtenaw County Food Policy Council; Huron Valley Democratic Socialists of America; Bee Safe Ann Arbor; City of Ypsilanti; Ann Arbor Summer Festival; Ann Arbor District Library; Pesticide-Free Ann Arbor; Slow Food Huron Valley; Common Cycle; Earth Sciences; Natural Resources Defense Council; Ann Arbor Main Street Association; Washtenaw Optimal Wellness; Downtown Development Authority; Mindful City Ann Arbor; and The Old Fourth Ward.

STAFF EXPERTISE

Staff expertise and research and analysis of published carbon neutrality literature, including Project Drawdown, were an integral component of planning. This included reviewing historical planning initiatives within the City, identifying existing successful initiatives, and reaching out to staff across the City to round out planning and engagement aspects of A^{2}Zero.

PEER LEARNING AND LITERATURE REVIEW

A key piece of our work was reaching out to and learning from peer communities working on carbon neutrality. This involved reading other community plans, talking to peer community liaisons, and researching key recommendations on community carbon neutrality from peer reviewed and technical sources.

OTHER

In addition to the aforementioned activities, the Office of Sustainability and Innovations also:

- Created a website to track activities around A^{2}Zero: www.A2Zero.org
- Created a listserv where stakeholders could continue to learn about A^{2}Zero
- Created a meeting-in-a-box kit that included materials so individuals could host their own A^{2}Zero events

  The meeting-in-a-box toolkit includes the following:

  - Guide on how to host your own A^{2}Zero meeting
  - A^{2}Zero slide deck with talking points, including discussion questions
  - A terminology sheet
  - A^{2}Zero overview sheet with is a 1-page document that summarizes the A^{2}Zero process and provides a snapshot of the initiative
  - Climate Change Overview – which is a 1 page document that introduces folk to the existing and projected climate change impacts in Ann Arbor
  - Sign-In sheet to track the individuals attending an event
  - Links to relevant A^{2}Zero surveys
  - Event results form to gather feedback about the event
  - Trivia questions to help make events more interactive and fun
  - Photo release form in case anyone was taking photos they intended to share
- Hired a communications firm to create a brand for the City's carbon neutrality work, through which A^{2}Zero emerged.

- Worked with Elevate Energy to assess the greenhouse gas reduction potential and costs associated with each action included in the final Plan.
- Created a 1-page fact sheet about A²Zero and the City's carbon neutrality work.
- Created a 1-page document summarizing the different sectors included in the City's carbon neutrality planning.
- Sent 11,000 backpack fliers to all K-5th grade students in Ann Arbor Public Schools.
- Developed A²Zero flyer for Ann Arbor Meals on Wheels to distribute to home bound residents.
- Developed flyer for all partners to display advertising the February 22nd Town Hall and the final A²Zero survey.

All of these activities were integral to creating A²Zero. In the end, this Plan was made by the community, for the community

THE LIVING CARBON NEUTRALITY PLAN



The remainder of this document highlights the actions that are part of the City's living A²Zero Carbon Neutrality Plan.

These actions are organized around the seven overarching strategies:

1. Power our electrical grid with 100% renewable energy
2. Switch our appliances and vehicles from gasoline, diesel, propane, coal, and natural gas to electric
3. Significantly improve the energy efficiency in our homes, businesses, schools, places of worship, recreational sites, and government facilities
4. Reduce the miles we travel in our vehicles by at least 50%
5. Change the way we use, reuse, and dispose of materials
6. Enhance the resilience of our people and our place
7. Other



STRATEGY 1:

Power Our Electrical Grid with 100% Renewable Energy

This strategy focuses on ensuring that all of the electricity used within our community is powered with renewable energy such as solar, geothermal, and wind. To achieve this strategy, four specific actions are proposed:

1. Implement Community Choice Aggregation
2. Support Onsite Renewables and Battery Storage
3. Develop Community Solar Program
4. Launch Landfill Solar Project

Combined, these four actions are projected to reduce community-wide greenhouse gas emissions by 41% and cost just over $4,100,000.

1. IMPLEMENT COMMUNITY CHOICE AGGREGATION

Community Choice Aggregation (CCA) program is an agreement among stakeholders to 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, the State will need to enact legislation to allow for CCA.

Vision for Implementing 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

Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- State legislature
- Other Michigan municipalities
- Michigan Municipal Association on Utility Issues (MI-MAUI)
- Michigan nonprofits focused on energy choice

Assumptions

- 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. This is a particularly useful option for residents who may not have the ability to otherwise install renewable energy systems at their residence, whether due to renting or to cost. A CCA program would provide renewable energy to those who may not otherwise be able to 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
The City begins working on recommendations for what to include in a CCA program.

2021
The City begins working with legislators to develop CCA legislation. Public education begins. about CCA

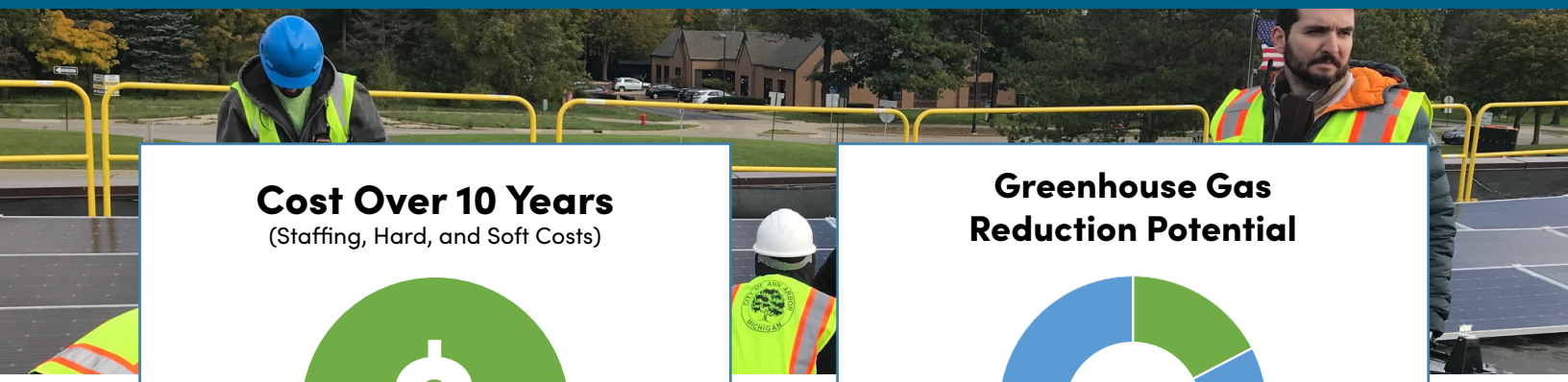
2024
The City begins planning the startup of the CCA program, undertaking feasibility studies, public engagement, and business model planning.

2025
CCA is enabled in Michigan through the passing of state legislation.

2026
Ann Arbor public vote to allow a local CCA purchase.

2027
CCA program launches in Ann Arbor and continues.



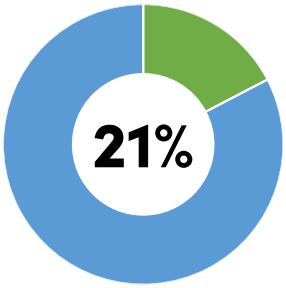


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$3,245,000

Greenhouse Gas Reduction Potential



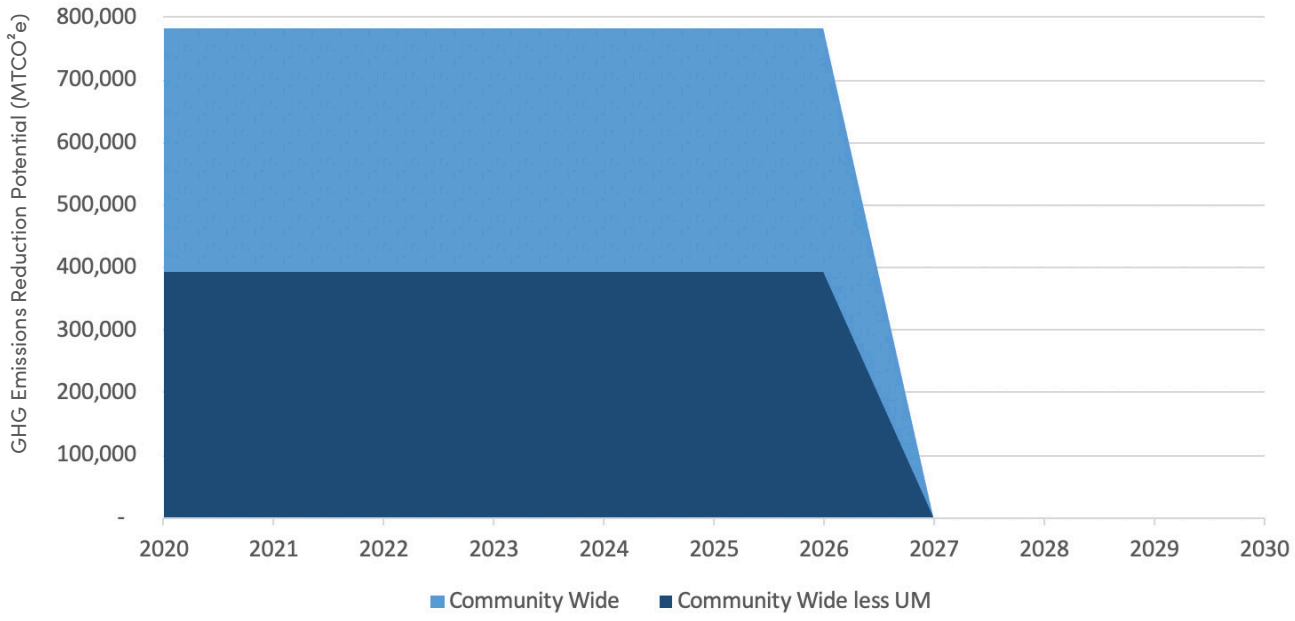
462,100 metric tons carbon dioxide equivalent (21% community-wide emissions)

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).

By 2027, the Implement **Community Choice Aggregation** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of Community Choice Aggregation (in light blue) assuming the community and University participate in the program. The dark blue shows the impact of Community Choice Aggregation if only the community (not the University) participates in the program.

IMPLEMENT COMMUNITY CHOICE AGGREGATION



2. SUPPORT ONSITE RENEWABLE ENERGY GENERATION WITH BATTERY STORAGE (BULK BUYS)

Renewable energy systems like geothermal, solar, and energy storage pay for themselves over their lifetime, but the upfront costs of installation can be a barrier for many people. To help reach our A²Zero goals, the City proposes establishing a bulk purchase program that enables residents and businesses to procure onsite renewables for a discounted price by achieving economies of scale.

Vision for Supporting Onsite Renewable Energy Generation with Battery Storage

By 2030, through the provision of bulk buys and discount programs, 78MW of local renewable energy is being generated on viable buildings, parcels of land, and carports. At least ¼ of these installations also have some form of battery storage, which is helping enhance the resilience of our local community and economy.[1]

Party Responsible for Implementation

Office of Sustainability and Innovations' Solarize Coordinator, with support from the OSI team

Collaborators / Project Co-Designers

- City of Ann Arbor Building, Rental, and Inspection Services
- Renewable energy contractors and installers
- Michigan Saves
- Potentially local banks

Assumptions

- 78MW of local renewable energy generation is achieved by 2030
- Pricing discounts of 5%, 10%, and potentially 15% are offered through the program
- The capacity generated through this initiative is not included in the CCA

Equity Impacts

Nonprofit organizations and public institutions may benefit from this program, but the benefits flow primarily to property owners.

Indicators of Success / Goals

78MW of new, local, onsite renewable energy generation is installed in Ann Arbor by the year 2030.

Target Demographic

Individuals who can install renewable energy on the buildings they own or operate, including homeowners, businesses, schools, and institutions

[1] In administering this program, OSI will also be looking to tie in energy efficiency support and electrification support so that each household or business receives a package of support as opposed to multiple different programmatic offerings.

Timeline and Initial Actions

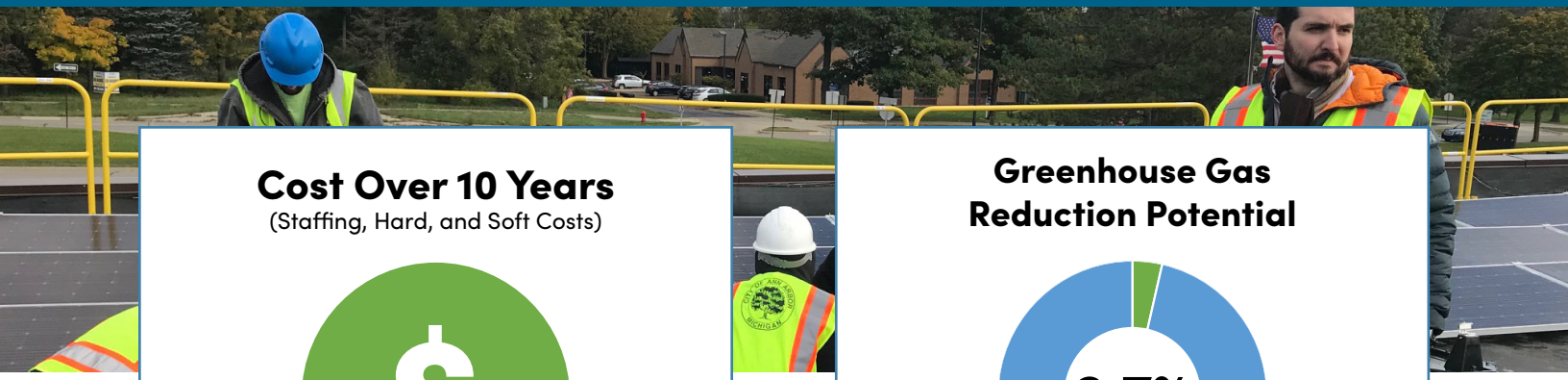
2020

Pilot test group buy in residential sector. Coordinate program with contractors. Conduct public outreach.

2020

Revise program based on lessons learned. Scale and continue to administer until at least 2030 (or until the program stops generating demand).





Cost Over 10 Years

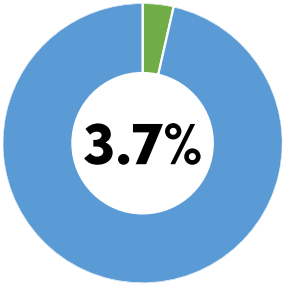
(Staffing, Hard, and Soft Costs)

Estimated

$605,000

($540,000 in staffing and $65,000 in stipends to community residents)

Greenhouse Gas Reduction Potential



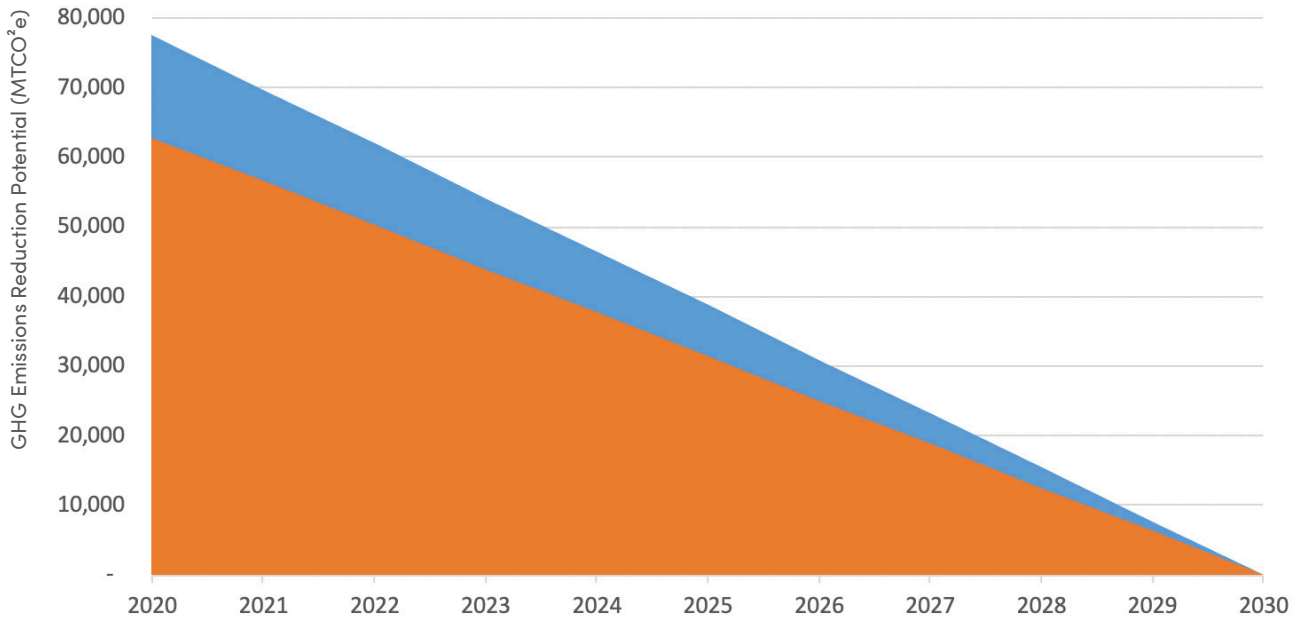
81,000 metric tons carbon dioxide equivalent (3.7% of community-wide emissions).

If the University of Michigan participates in this action, an additional 4,000 metric tons carbon dioxide equivalent could be reduced, resulting in a total of 85,000 metric tons carbon dioxide equivalent (3.9% community-wide emissions).

By 2030, the Support **Onsite Renewable Energy Generation with Battery Storage (Bulk Buys)** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of onsite renewable energy generation (in light blue) assuming the community and University participate in the program. The orange shows the impact of onsite renewable energy generation if only the community (not the University) participates in the program.

SUPPORT ONSITE RENEWABLE ENERGY GENERATION WITH BATTERY STORAGE (BULK BUYS)



3. DEVELOP COMMUNITY SOLAR PROGRAM

Not all residents and businesses are able to install solar on their property. This may be because of inadequate solar exposure, not owning one's home, or financial barriers associated with renewable energy. To provide options to all who want to invest in solar locally, the City of Ann Arbor, in partnership with our utility, will create and support a robust community solar program which allows solar installations on public properties. Community solar programs allow residents and business to purchase solar panels from an existing solar farm and receive an on-bill credit as if those panels were actually on their roof. State legislation is needed to enable community solar programs but the City is already working with state legislators to move this idea forward.

Vision for Developing Community Solar Program

By 2030, 11 MW of community solar has been established locally. As our community builds demand for community solar, the landfill solar site in opened for public subscriptions and the City's demand for renewable energy is moved to create even more local renewable energy generation.

Party Responsible for Implementation

Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- DTE Energy
- State of Michigan
- Partner organizations

Assumptions

- Community solar is enabled at the state
- Demand for community solar reaches at least 11MW by 2030
- On-bill financing is possible

Equity Impacts

Community solar primarily benefits those without the ability to install their own renewable energy projects.

Indicators of Success / Goals

By 2030, 11MW of new renewable energy has been created and is subscribed through a community solar program.

Target Demographic

Those who face barriers to installing solar on the buildings they inhabit, including renters, low-income residents, and those with shaded or obstructed roofs

Timeline and Initial Actions

2021

Enabling legislation passed and City works with DTE Energy to create local pilot community solar program.

2022

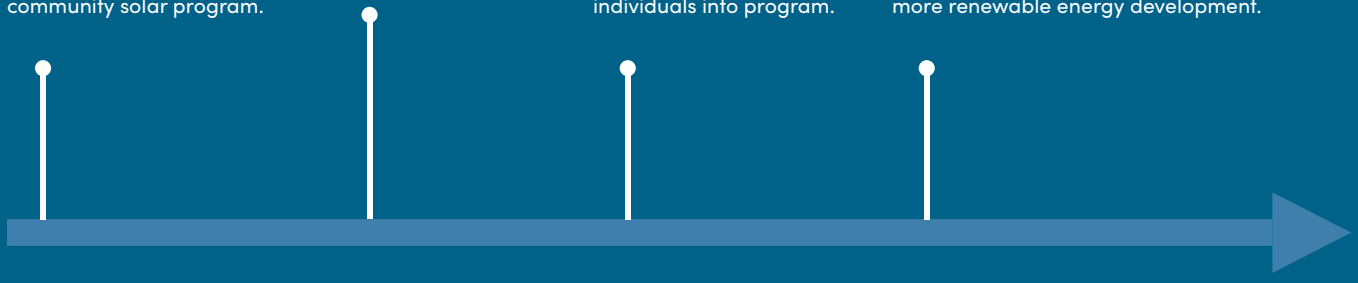
Local pilot program launches.

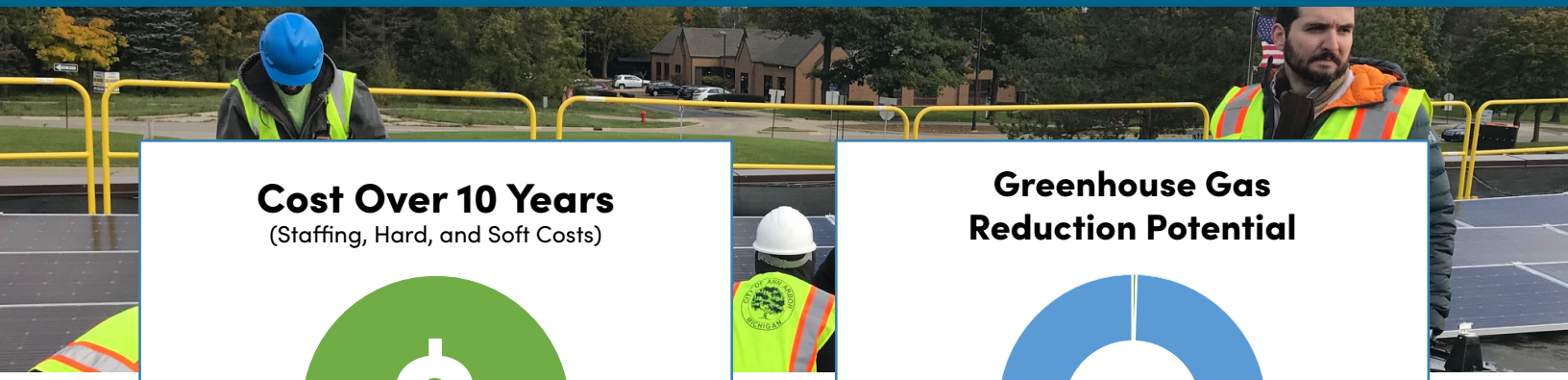
2024

Expansion of community solar program locally. Includes recruitment of individuals into program.

2026

Landfill solar site opens up for community subscriptions given the success of the initiative. Allows City to take its demand to stimulate more renewable energy development.

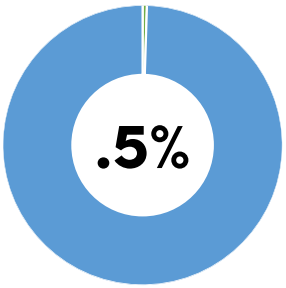




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

Costs to the City are
$205,000
over 10 years to help administer the program. If the City becomes an anchor tenant, the costs would rise.

Greenhouse Gas Reduction Potential

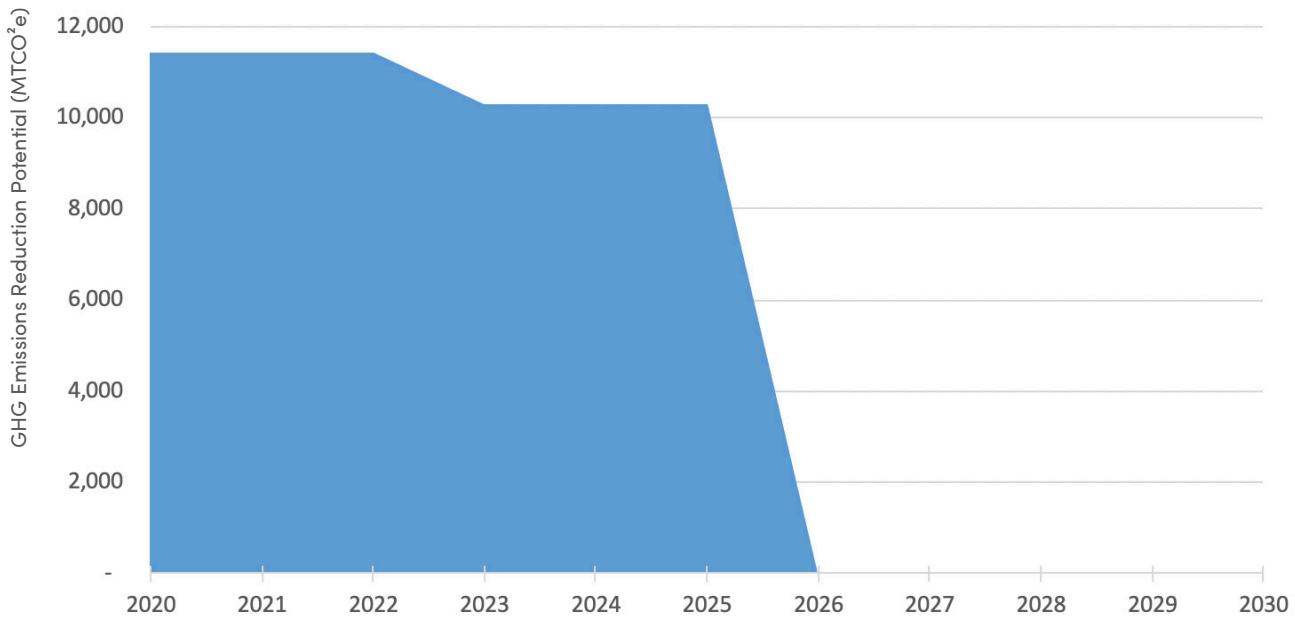


11,500 metric tons carbon dioxide equivalent (.5% of community-wide emissions)

By 2026, the Develop **Community Solar Program** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of onsite renewable energy generation (in light blue) assuming the community and University participate in the program.

DEVELOP COMMUNITY SOLAR PROGRAM



4. LAUNCH LANDFILL SOLAR PROJECT

The City of Ann Arbor is developing a utility scale solar project with DTE Energy to operate on the City-owned landfill and in Pittsfield Township. The intention is that this installation will provide enough energy to offset roughly 80% of Ann Arbor municipal energy usage. In addition to ground mounted solar, the project incorporates a pilot of solar panels installed on a retention pond, provides a portion of clean energy for Pittsfield Township to offset their municipal operations, and has many co-benefits including creating habitat for local pollinators. If demand exists and enabling legislation is passed, the solar project may be integrated into a community solar program.

Vision for Launching Landfill Solar Project

By 2030, the City-owned landfill and surrounding property has 24 MW of installed solar capacity, the vast majority of it used to offset Ann Arbor municipal energy use.

Party Responsible for Implementation

Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- DTE Energy
- State of Michigan
- Partner organizations

Assumptions

- The landfill is deemed a viable site for utility-scale solar
- Current federal tax credits are leveraged to reduce cost of project

Equity Impacts

Should the landfill solar project include community solar provisions, it could serve many Ann Arborites who cannot install their own solar arrays, whether due to renting, cost, or those with roofs not optimal for solar.

Indicators of Success / Goals

By the end of 2023, a 24MW solar installation is fully operational at the former Ann Arbor landfill and on the land held in PUD with Pittsfield Township.

Target Demographic

The City of Ann Arbor and Pittsfield Township. Once local demand is established, the project may be turned into a community solar program

Timeline and Initial Actions

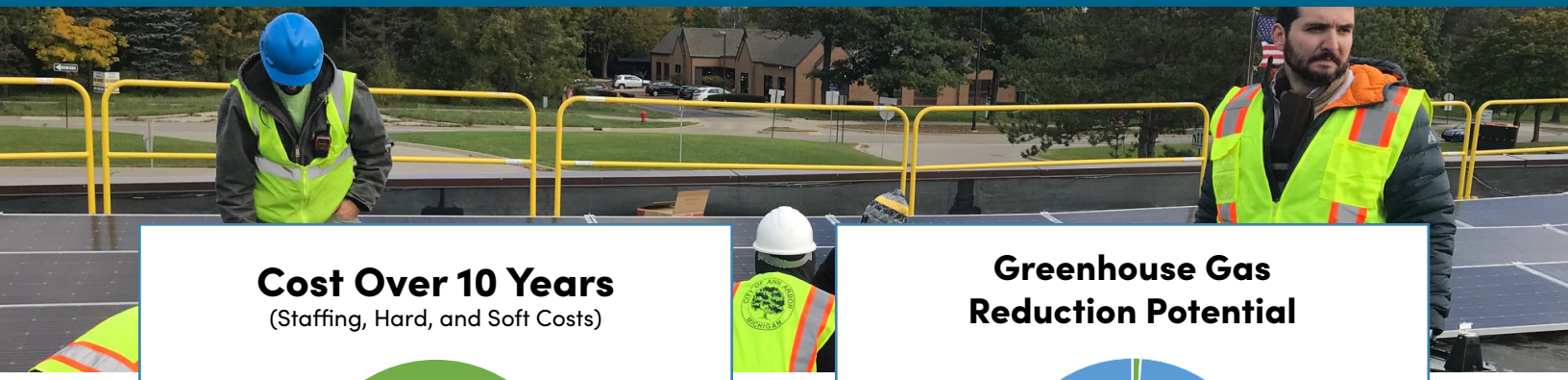
2020

The City of Ann Arbor, in partnership with DTE Energy and Pittsfield Township, completes feasibility and technical assessments of the site. If the project is deemed feasible, an RFP is released and safe harboring of equipment is undertaken.

2023

The landfill solar project begins operation, providing local renewable energy.



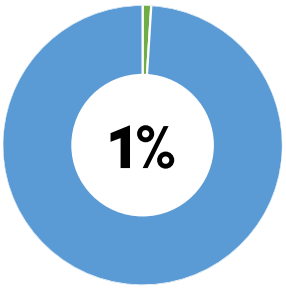


Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

Estimated
$80,000
for staffing support

Final cost to be determined based on any required costs to upgrade the grid at the point of intersection.

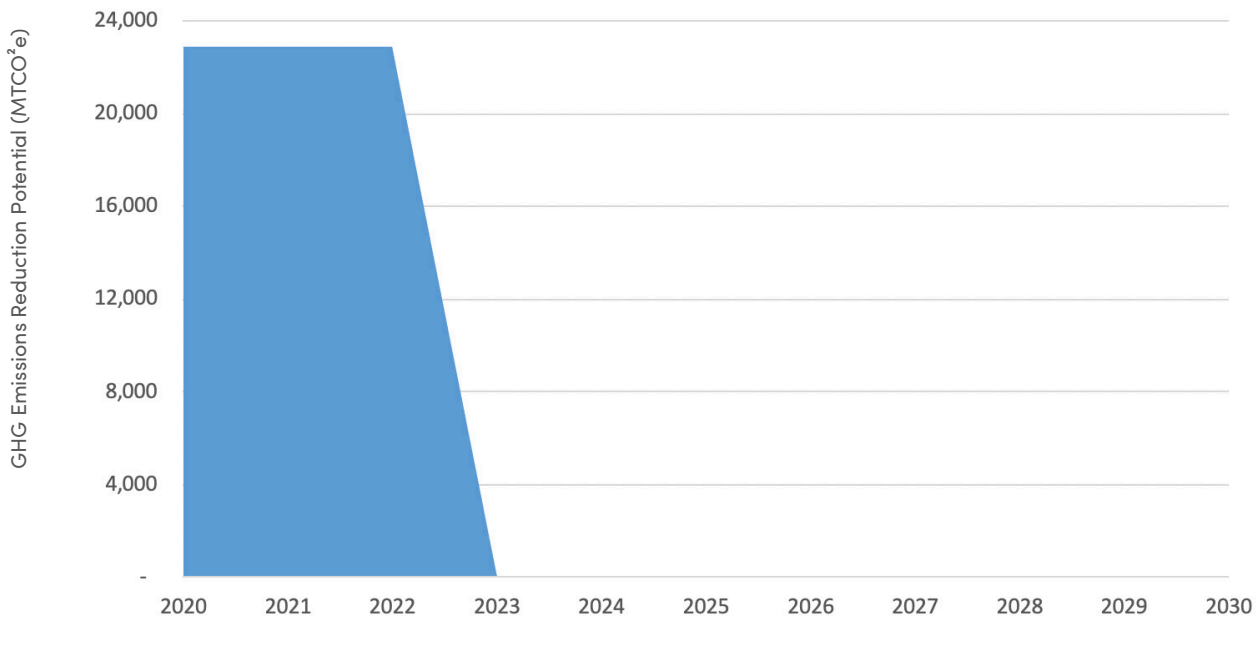
Greenhouse Gas Reduction Potential



23,000 metric tons carbon dioxide equivalent (1% of community-wide emissions)

By 2023, the Launch **Landfill Solar Project** strategy will have achieved all of its potential greenhouse gas emissions reduction potential.

LAUNCH LANDFILL SOLAR PROJECT





STRATEGY 2:

Switch our Appliances and Vehicles from Gasoline, Diesel, Propane, Coal, and Natural Gas to Electric

This strategy focuses on converting the vast majority of our existing gasoline, diesel, propane, coal, and natural gas powered equipment, appliances, and vehicles to electric. This is particularly important since we are working to ensure our electrical grid is powered with 100% renewable energy. To achieve this strategy, 6 specific actions have been identified:

1. Promote Home & Business Electrification
2. Electrify Buses
3. Support Community Electric Vehicle and Solar Bulk Buys
4. Electrify City Fleet
5. Electrify Private Fleet
6. Expand Electric Vehicle Charging Infrastructure

Combined, these six actions are estimated to reduce community-wide emissions by 23% and cost just over $143,000,000.

1. PROMOTE HOME & BUSINESS ELECTRIFICATION

The use of natural gas for heating space and water, as well as cooking in buildings represents over 25% of our community's greenhouse gas emissions. Transitioning away from natural gas to electric, especially given our work to ensure that all electricity is powered with renewable energy, is a pivotal component of A^{2}Zero. To support the electrification of appliances, the City of Ann Arbor will work to establish policies that promote electrification of heating and cooking systems by evaluating options in codes, inventive programs, and through other avenues. The City of Ann Arbor will lead this effort by electrifying all municipal buildings.

Vision for Promoting Home & Business Electrification

By 2030, 100% of city facilities, 30% of owner-occupied homes, and 25% of rental properties have fully electrified and conducted air sealing and insulation improvements. The electricity now used by these systems is sourced from renewable energy, and the additional capacity has been incorporated into plans for community-wide renewable energy purchasing initiatives. Additionally, building occupants benefit from better indoor air quality.

Party Responsible for Implementation

- Office of Sustainability and Innovations
- For City buildings – Facilities with support from Office of Sustainability and Innovations

Equity Impacts

Few equity impacts from this action except as part of the community solar program (above).

Collaborators / Project Co-Designers

- City of Ann Arbor legal team
- City of Ann Arbor Building, Rental, and Inspection Services
- Michigan Saves
- Home Improvement Stores
- Contractors (i.e., energy efficiency, repair, installation)

Indicators of Success / Goals

By 2030, 100% of city facilities, 30% of owner-occupied homes, and 25% of rental properties have fully electrified and the electricity powering those homes is coming from renewable energy sources.

Assumptions

- 30% of single family homes are all electric by 2030, not including the 20% already using electric heat
- 25% of rentals are all electric by 2030
- City commits to and achieves 100% electrification by 2030
- A 1:1 replacement of natural gas energy to electricity, with 1CCF gas transitioning to 30.36kWh electricity
- All new residential and commercial buildings are designed and built to operate without the use of natural gas, reducing the increased cost associated with retrofitting existing systems
- All additional electric consumption is powered by an associated increase in renewable energy sources

Target Demographic

All buildings in Ann Arbor, including single-family homes, rentals, and businesses. The action was modeled to show the impact if the University of Michigan participates as well as if it does not

Timeline and Initial Actions

2020

Conduct legal analysis and finalize electric vehicles (EV) readiness ordinance.

2021

Develop electrification policy. Begin planning administrative program. Capacity building by ensuring enough contractors are trained in electric heating systems appropriate for Ann Arbor's climate. EV readiness ordinance adopted.

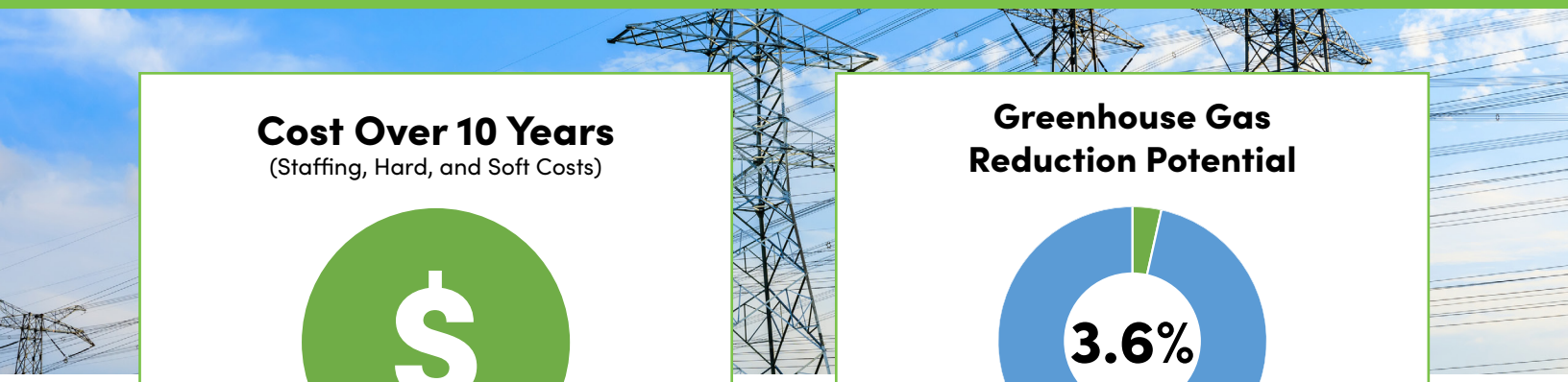
2023

Public outreach and education, including visible and accessible alternatives to natural gas systems. Program launches and is enforced.

2024

Buildings transition at a steady rate annually.





Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

Estimated

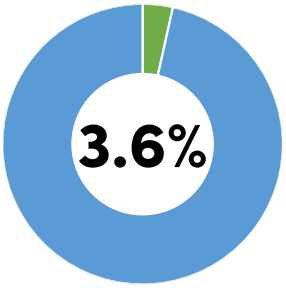
$1,400,000

staffing, trainings, and administrative costs for community portion of electrification program.

$5,700,000

for transitioning City facilities to all electric.

Greenhouse Gas Reduction Potential



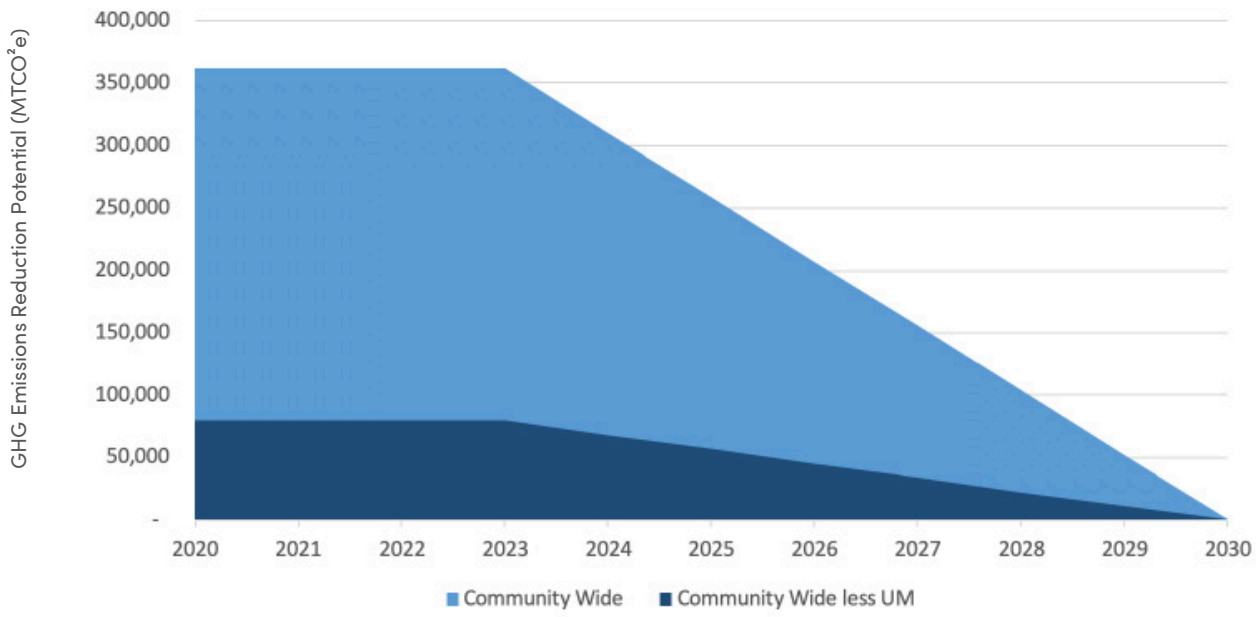
79,200 metric tons carbon dioxide equivalent (3.6% of community-wide emissions) for residential and municipal electrification.

If the University of Michigan were to electrify all of their operations and power that additional electrical demand with clean energy, it would be an additional reduction of 283,000 metrics tons of carbon dioxide equivalent (13% of community-wide greenhouse gas emissions), resulting a total of 362,200 metric tons of carbon dioxide equivalent (16.5% of community-wide emissions).

By 2030, the **Promote Home & Business Electrification** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of home and business electrification (in light blue) assuming the community and University participate in the program. The dark blue shows the impact of home and business electrification if only the community (not the University) participates in the program.

PROMOTE HOME AND BUSINESS ELECTRIFICATION



2. ELECTRIFY BUSES

This action involves electrifying TheRide's diesel and diesel-hybrid fleet of 87 buses as well as the University of Michigan's ethanol, biodiesel, and gasoline buses on an aggressive time line.

Vision For Electrifying Buses

By 2030, TheRide and UM's bus fleet have transitioned to electric propulsion. Consequentially, both entities are enjoying lower maintenance, operating, and fuel costs. Solar has been installed on AATA and UM properties so that the electricity running the buses is 100% carbon-free.

Party Responsible for Implementation

- TheRide, with support from the Office of Sustainability and Innovations' Sustainability Analyst
- UM Transportation Department, with support from the Office of Sustainability and Innovations

Party Responsible for Implementation

- DTE Energy
- Michigan Department of Environment, Great Lakes, and Energy (EGLE)
- UM Energy Institute
- UM Carbon Neutrality Commission

Equity Impacts

Electrifying buses will give riders a cleaner, more comfortable, and healthier ride. Communities who live along electrified bus routes will benefit from reduced asthma and COPD rates, which disproportionately impact communities of color and low-income communities.

Indicators of Success / Goals

By 2030, TheRide and UM's entire fleet of buses are electric and their power is drawn from renewable energy.

Assumptions

- Annually, 9 new electric buses are purchased starting in 2021 for TheRide
- UM replaces buses at a rate of approximately 5 per year
- Bus fleets stay at their current level
- A traditional bus is $525,000; an electric bus is $750,000
- No value calculated for selling diesel or gasoline buses
- 2 additional electric buses are purchased per year to grow the fleet and expand service
- Assumes limited operational savings in the first few years of operation as facilities adjust to new types of buses
- Costs are only calculated for TheRide's portion of electric buses
- Air quality improves along the bus corridors

Target Demographic

Bus riders and potential bus riders

Timeline and Initial Actions

2020

Planning for e-buses commences. Grant applications filed.

2021

TheRide purchases 9 new e-buses and installs EV charging infrastructure that will be needed for first 5 years of operation. UM purchases first 5 buses and EV charging infrastructure.

2030

All buses operated by TheRide and UM are electric.





Cost Over 10 Years

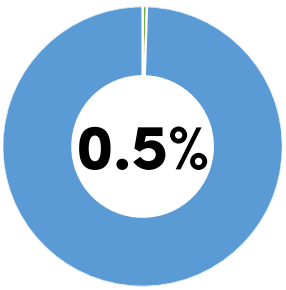
(Staffing, Hard, and Soft Costs)

Estimated

$80,575,000

(only accounting for TheRide's electric buses)

Greenhouse Gas Reduction Potential

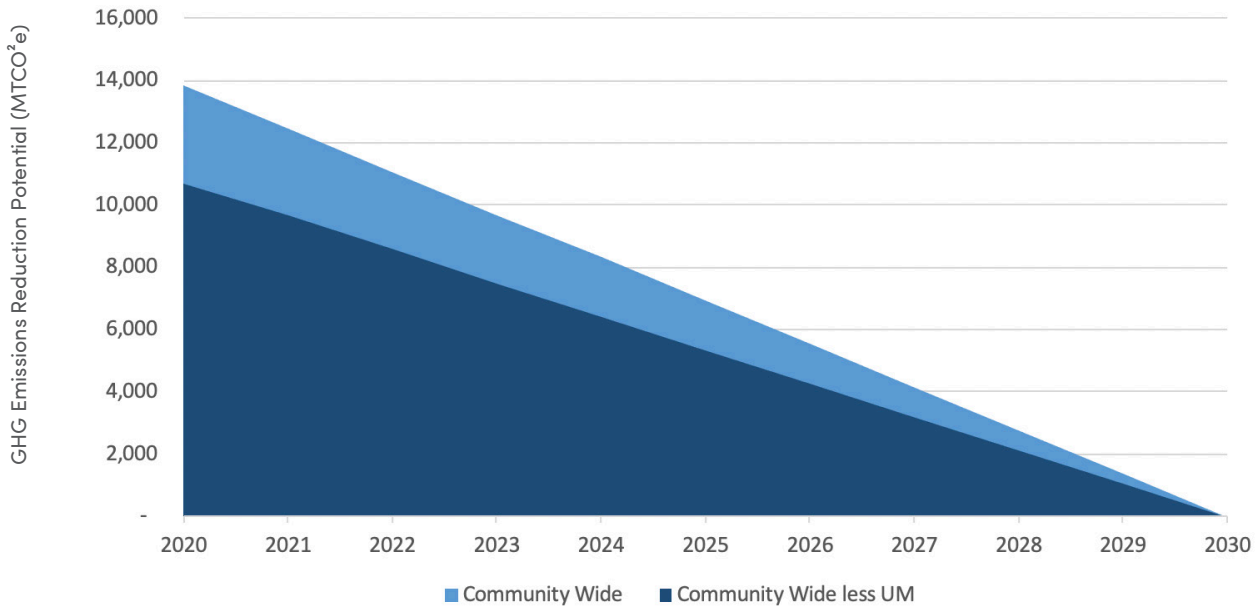


10,700 metric tons of carbon dioxide equivalent (0.5% of community-wide emissions) if TheRide buses are electrified. If the University of Michigan participates and also converts their buses, an additional 3,100 metric tons of carbon dioxide equivalent (0.1% of community-wide emissions) are also reduced. In total, 13,800 metric tons of carbon dioxide equivalent (0.6% of community-wide emissions)

By 2030, the **Electrify Buses** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of bus electrification (in light blue) assuming the community and University participate in the program. The dark blue shows the impact of bus electrification if only the community (not the University) participates in the program.

ELECTRIFY BUSES



3. SUPPORT COMMUNITY ELECTRIC VEHICLE 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. In order to promote immediate EV purchases, group-buy programs are only offered for a limited time, typically a few months. Coupling EV group-buy programs with purchase programs for residential solar installation allows EV owners to reduce their EV charging costs, while helping the City of Ann Arbor transition towards clean, renewable energy. The program includes the creation of incentives for low-income residents to purchase off-lease or used EVs.

Vision for Supporting Community Electric Vehicle and Solar Bulk Buys

Residents and businesses in Washtenaw County can purchase new and used EVs at a discount of 10-15%. Local dealerships participate with their auto manufacturers to ensure ample EV stock is available on dealerships' lots and that their sales teams are educated about EVs. Residents are able to pair solar (through Solarize program) with EVs, which should significantly reduce the payback period for solar and the EV.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- DTE Energy
- Michigan Saves
- Energy Commission
- Transportation Commission
- Washtenaw Electric Auto Association
- Urban Sustainability Directors Network
- Local auto dealerships
- Major auto companies (OEMs)
- Plug In America's PlugStar program
- Smart Columbus Electrified Dealers program
- University of Michigan

Equity Impacts

We will explore offering bulk buys for EVs that are coming off leases, and offer bulk buys for e-scooters and e-bikes to ensure equitable and affordable options for all.

Indicators of Success / Goals

By 2030, 50% of all vehicles miles traveled are in electric vehicles.

Assumptions

- DTE Energy will continue partnering with the City
- OEMs will have enough cars to meet demand
- Reduced rates are available through the bulk buy
- The CCA purchase will help reduce new electricity demand from Ann Arbor EV owners

Target Demographic

Residents and local car dealership employees

Timeline and Initial Actions

2020

OSI and DTE Energy kick off a group buy program for City staff with one or two OEMs participating.

2021

OSI and DTE Energy expand the program to all DTE Energy customers in their service territory. The program also includes more OEMs and dealerships participating.

2022

OSI and DTE Energy expand the offering to include paired solar installations.



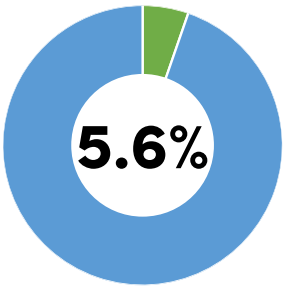


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$700,000

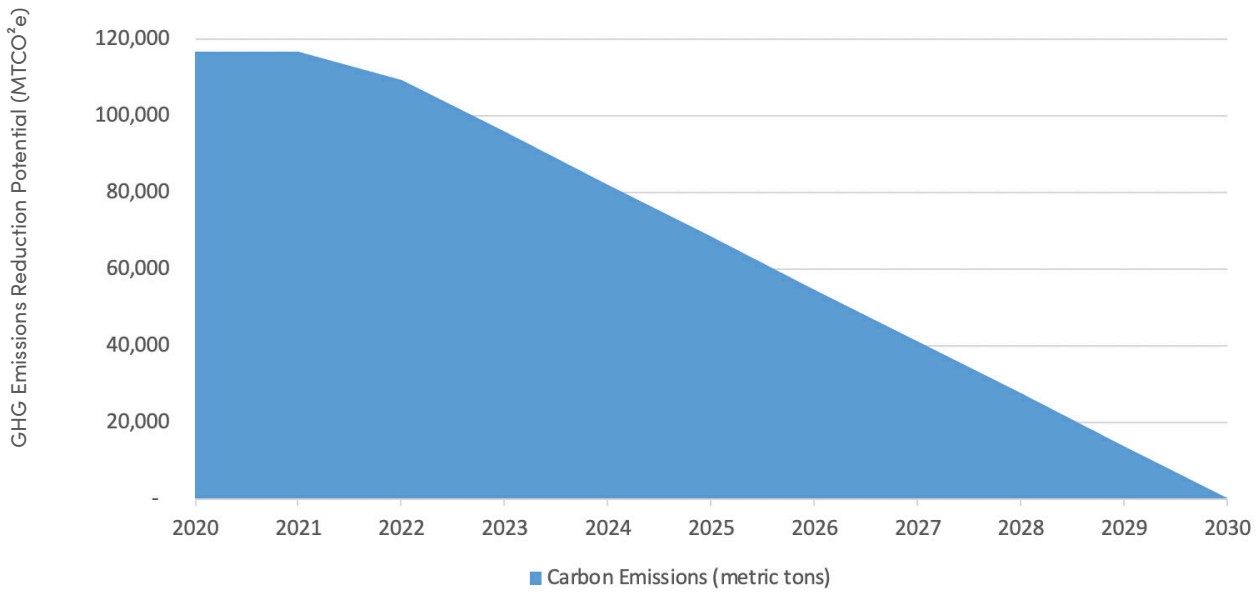
Greenhouse Gas Reduction Potential



122,900 metric tons carbon dioxide equivalent (5.6% of community-wide emissions)

By 2030, the **Support Community Electric Vehicle and Solar Bulk Buys** strategy will have achieved all of its potential greenhouse gas emissions reductions.

SUPPORT COMMUNITY ELECTRIC VEHICLE AND SOLAR BULK BUYS



4. ELECTRIFY CITY FLEET

In June 2017, City Council approved Resolution R-17-237, directing the City Administrator to update and revive the City's Green Fleets Policy, promote the purchase of plug-in electric vehicles, and incorporate updated best practices and lessons learned from peer municipalities. The Green Fleets Team (GFT) was given until the first quarter of 2020 to develop a plan for electrifying the City fleet by 2025. Because there are so many more electric vehicle options for light duty vehicles at this time, the GFT focused first on transitioning those and then on electrifying construction equipment and medium- and heavy-duty vehicles.

Vision for Electrifying City Fleet

By 2025, 90% of the City's fleet has transitioned to electric. The remaining 10% are pieces of medium- and heavy-duty vehicles and equipment that cannot be electrified.

Party Responsible for Implementation

- Fleets and Facilities Department, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Green Fleets Team
- The Electrification Coalition
- Ecology Center

Equity Impacts

Improved local air quality for all.

Indicators of Success / Goals

By 2025, 90% of the City's fleet has transitioned to electric.

Assumptions

- EV market continues to grow and move into new market shares
- Electricity from the EVs is powered through CCA or onsite solar

Target Demographic

Ann Arbor City Employees

Timeline and Initial Actions

2020

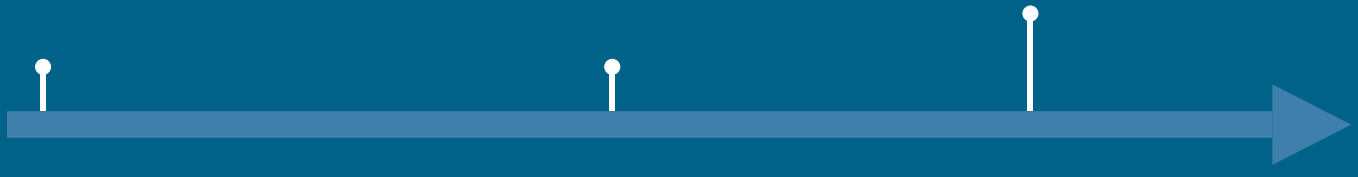
Municipal fleet electrification strategy complete and updated fleet replacement rates calculated.

2021

New fleet replacements rates integrated into the budget.

2025

90% of fleet is transitioned to electric.





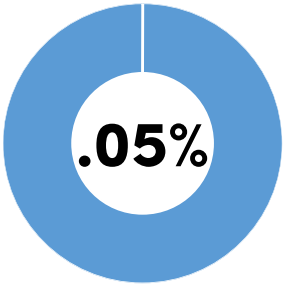
Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$4,000,000

(only accounting for TheRide's electric buses)

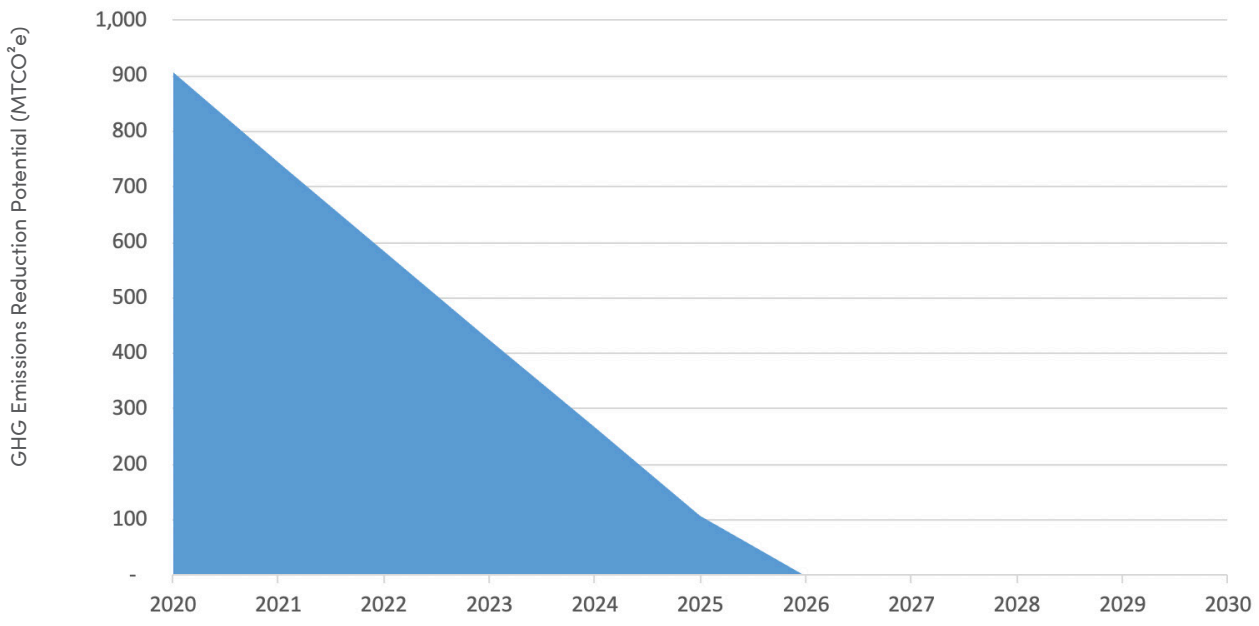
Greenhouse Gas Reduction Potential



1,100 metrics tons of carbon dioxide equivalent (0.05% of community-wide emissions)

By 2026, the **Electrify City Fleet** strategy will have achieved all of its potential greenhouse gas emissions reductions.

ELECTRIFY CITY FLEET



5. ELECTRIFY PRIVATE FLEETS

Programmatic support is offered, along with an ambitious outreach and education program, to support private companies with transitioning their fleets to electric. This includes working with the State and utilities to offer more rebates and incentive programs, and sharing information about existing rebates for charging.

Vision for Electrifying Private Fleets

Medium and large companies in Ann Arbor help the City meets its ambitious climate neutrality goal by transitioning their fleets to electric, encouraging their employees to drive EVs, and installing EV charging infrastructure. Ridesharing companies have agreed to franchise agreements which require that at least half of their fleets are EVs.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Equity Impacts

Improved local air quality for all.

Collaborators / Project Co-Designers

- DTE Energy
- The Electrification Coalition
- Ecology Center
- Washtenaw Electric Automobile
- Association
- Ann Arbor 2030 District
- Ceres
- DDA
- EGLE
- Employers in Ann Arbor with large fleets
- Ridesharing and ride hailing companies
- Delivery companies

Indicators of Success / Goals

By 2030, 50% of private fleets within the City are electric.

Assumptions

- Corporate fleets will encourage a transition to EVs
- The State and utilities will continue to provide incentives for fleet electrification

Target Demographic

Employees and owners of medium to large business in Ann Arbor

Timeline and Initial Actions

2021

Installation of 20 new level 2 EV chargers in each DDA parking garage and lot (using DTE Energy rebates).

2022

As needed, install more level 2 chargers in garages (75% cap for EV parking charging spots in any garage). Create new Direct Current Fast Chargers (DCFC) infrastructure for use by ride hailing companies, car sharing services, and the public (not fee based).

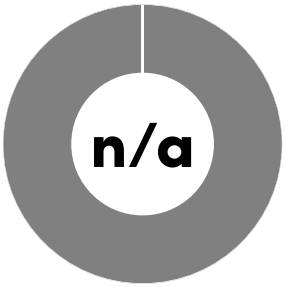




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$123,000

Greenhouse Gas Reduction Potential



The impact of this action was not calculated separately but included in the EV bulk buy action.

ELECTRIFY PRIVATE FLEETS



6. EXPAND ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

In the next three decades, electric vehicles (EVs) will replace internal combustion engine (ICE) vehicles as the dominant type of vehicles on the market. This action item aims to significantly increase electric vehicle charging infrastructure at parking lots and garages, park and ride lots, ride sharing spots, workplaces, and City facilities to support this transition.

Vision for Expanding Electric Vehicle Charging Infrastructure

Ann Arbor has plentiful EV charging infrastructure deployed to meet the needs of a burgeoning transition from ICE vehicles to EVs. While 80% of EV charging will continue to happen at home, public and workplace charging has expanded to fill in the remaining gaps.

Party Responsible for Implementation

- Office of Sustainability and Innovations, in partnership with Downtown Development Authority
- City's Engineering Department Transportation Group

Collaborators / Project Co-Designers

- State of Michigan (EGLE)
- Private businesses for workplace charging
- Property owners for multifamily charging
- Residents for home-based charging
- UM for campus charging
- Transportation Commission
- Ann Arbor 2030 District
- EV charger manufacturers and installers
- Affordable housing community
- Project developers for new housing and commercial projects
- DTE Energy

Equity Impacts

Placement of new EV chargers prioritizes renters in multifamily housing and street-side for residents who do not have a garage or driveway. Expanded public charging in garages and lots will ensure that some basic level of charging is available to all who need it.

Indicators of Success / Goals

10% of all public and private parking spaces are equipped with level 2 EV chargers and 2% with Direct Current Fast Chargers (DCFCs).

Assumptions

- 1,250 level two chargers are installed a year starting in 2021; each year 200 of these chargers are paid for through utility rebates
- 2 fast chargers are installed in the community each year; both are paid for through utility rebates
- Any additions to electrical capacity will be paid for separately
- New EV chargers will be prioritized for placement in low-income areas
- All additional electricity demand is integrated into the CCA

Target Demographic

Current and future EV owners who drive in Ann Arbor

Timeline and Initial Actions

2021

Installation of 20 new level 2 EV chargers in each DDA parking garage and lot (using DTE Energy rebates).

2022

As needed, install more level 2 chargers in garages (75% cap for EV parking charging spots in any garage). Create new Direct Current Fast Chargers (DCFC) infrastructure for use by ride hailing companies, car sharing services, and the public (not free to use)





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

$

$42,000,000

Greenhouse Gas Reduction Potential



This action does not directly lead to greenhouse gas reductions but contributes to the ability of residents and businesses to invest in electric vehicles.

EXPAND ELECTRIC VEHICLE CHARGING INFRASTRUCTURE





STRATEGY 3:

Significantly Improve the Energy Efficiency in our Homes, Businesses, Schools, Places of Worship, Recreational Sites, and Government Facilities

This strategy focuses on drastically improving the energy efficiency of our homes, businesses, schools, places of worship, government buildings, and recreational sites. To achieve this strategy, 11 specific actions have been identified:

1. Transition to More Energy Efficient Homes and Businesses
2. Update Building Codes
3. Power Street Lighting and Traffic Signals with LED
4. Benchmark and Disclose Energy Usage
5. Establish Loan Loss Reserve
6. Develop Energy Concierge and Community Engagement Program
7. Transition Affordable Housing Sites to Net Zero Energy
8. Promote Green Rental Housing Program
9. Launch Green Business Challenge
10. Support Aging in Place Efficiently
11. Expand Weatherization Program

Combined, these 11 actions are projected to reduce community-wide emissions by 13.4% and cost just over $14,500,000.

1. TRANSITION TO MORE ENERGY EFFICIENT HOMES AND BUSINESSES

As much as 80% of energy consumed in our buildings is wasted, through gaps in building envelopes or unnecessary operation of lights and electronics. Improving building envelopes with better insulation and windows, efficient lighting and appliances, and advanced heating and cooling systems can have a significant impact on the amount of energy our community uses to heat and cool our buildings. While energy efficiency improvements pay for themselves through energy savings over time, the upfront cost of installing them can be a barrier for many. Through a widespread, comprehensive group-buy program, the City of Ann Arbor can encourage and enable residents and businesses to procure energy efficiency products for a discounted price.

Vision for Transitioning to More Energy Efficient Homes and Businesses

Through a broad-reaching public engagement campaign, 80% of residents and businesses participate in energy efficiency group-buys, incentivized through discounts achieved through economies of scale. The campaign is inclusive, designed with input from the public and helps reduce energy use of participating buildings by 20%.

Party Responsible for Implementation

- Ann Arbor Building, Rental, and Inspection Services, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Local contractors and local energy efficiency financers, like Michigan Saves
- City of Ann Arbor Building, Rental, and Inspection Services
- Community liaisons, including neighborhood ambassadors
- DTE Energy

Equity Impacts

If coupled with the Green Rental Housing Policy, all rental housing in homes will be mandated to achieve energy efficiency standards as part of maintaining a rental license through the City.

Indicators of Success / Goals

85% of owner occupied homes, 80% of tenant occupied homes, and 80% of businesses achieve a 20% reduction in electricity usage and 15% reduction in natural gas usage by 2030.

Assumptions

- 85% of owner occupied homes are retrofitted and achieve a 20% electricity savings and 15% natural gas savings
- 80% of tenant occupied and commercial enterprises are retrofitted and achieve a 20% electricity savings and 15% natural gas savings

Target Demographic

This program reaches all homeowners, landlords, and businesses through targeted engagement strategies

Timeline and Initial Actions

2020

Program design and contractor outreach and education.

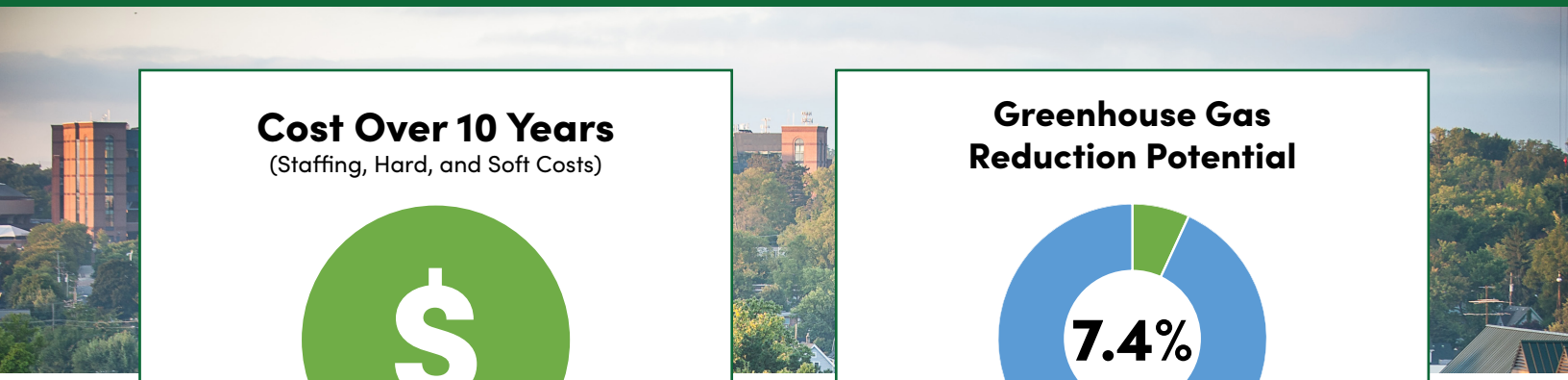
2021

Program launches and first bulk buy takes place. Participation steadily increases annually.

2030

85% of owner occupied homes, 80% of tenant occupied homes, and 80% of businesses have had an energy efficiency improvement.

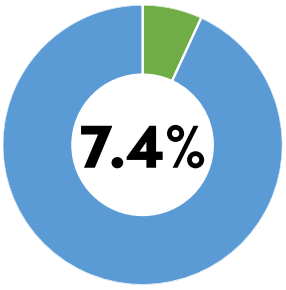




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$950,000

Greenhouse Gas Reduction Potential



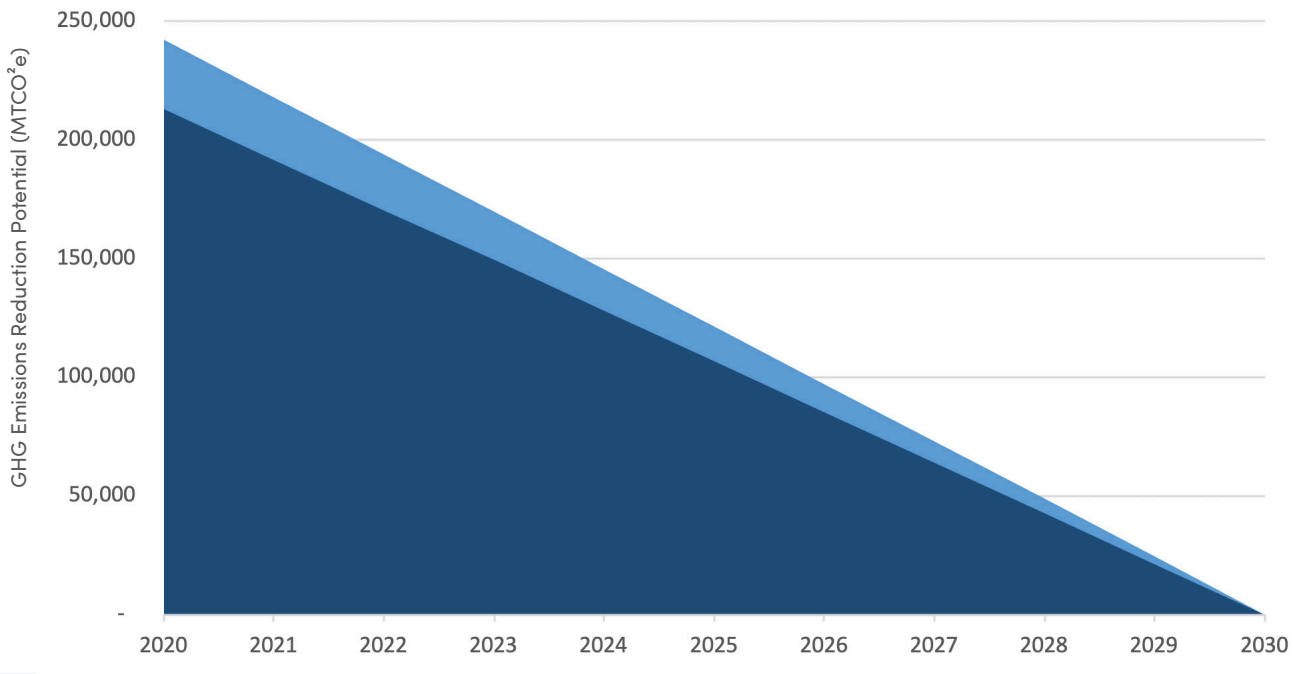
161,000 metric tons of carbon dioxide equivalent (7.4% of community wide emissions).

If the University of Michigan participates and achieves a 20% reduction in total energy usage, an additional 81,500 metric tons of carbon dioxide equivalent could be reduced, resulting in a total of 242,500 metric tons of carbon dioxide equivalent (11.1% of community-wide emissions).

By 2030, the **Transition to More Energy Efficient Homes and Businesses** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the total emissions reduction potential of efficiency initiatives (in light blue) assuming the community and University participate in the program. The dark blue shows the impact of efficiency initiatives if only the community (not the University) participates in the program.

TRANSITION TO MORE ENERGY EFFICIENT HOMES AND BUSINESSES



2. UPDATE BUILDING CODES

Buildings are the largest source of greenhouse gas emissions locally. Doing all we can to reduce their energy consumption and greenhouse gas emissions will have a significant impact on our ability to achieve carbon neutrality. In Michigan, local municipalities are constrained by the State's building code, meaning that efforts to advance more energy efficient and ideally net zero energy buildings will need to be done through changes in the State's building code. This action focused on working 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.

Vision for Updating Buildings Codes

By 2030, through an update to the State's building code, all new buildings and major renovations have been built to net zero energy standards. Any and all growth in Ann Arbor is done so sustainably and equitably.

Party Responsible for Implementation

- Ann Arbor Building, Rental, and Inspection Services, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- State of Michigan
- Developers and contractors

Equity Impacts

At first, primarily higher income residents will occupy the new buildings that will be more energy efficient. However, over the long term, all Ann Arborites will benefit from stronger building codes.

Indicators of Success / Goals

By the end of 2030, 2,120 residential units and 160 commercial units are net zero energy buildings.

Assumptions

- All new construction from 2022 through 2030 (and beyond) is built to net zero energy standards, which includes no natural gas consumption and all electricity usage offset through the CCA
- Annual growth rate of 265 housing units for residential, based on past growth rate of housing units per census data
- Annual growth rate of 21 units annually for commercial enterprises, based on past growth rate of commercial units per building permit data
- Does not include savings associated with renovations as those are calculated in other areas of this Plan

Target Demographic

Developers constructing new and renovating buildings

Timeline and Initial Actions

2020

Work with state and local partners to garner support for adopting the 2021 building code and zero code appendix.

2021

State adopts updated building code. City creates infrastructure to support developers, the construction community, electricians, and others in achieving the Code. City works with state on educational material and trains inspectors. Enforcement begins.

2022

City maintains administrative support to achieve code. Enforcement continues. City works with 2030 District to launch net zero energy districts.

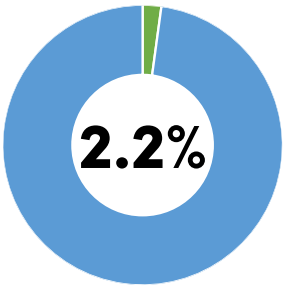




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$1,935,000

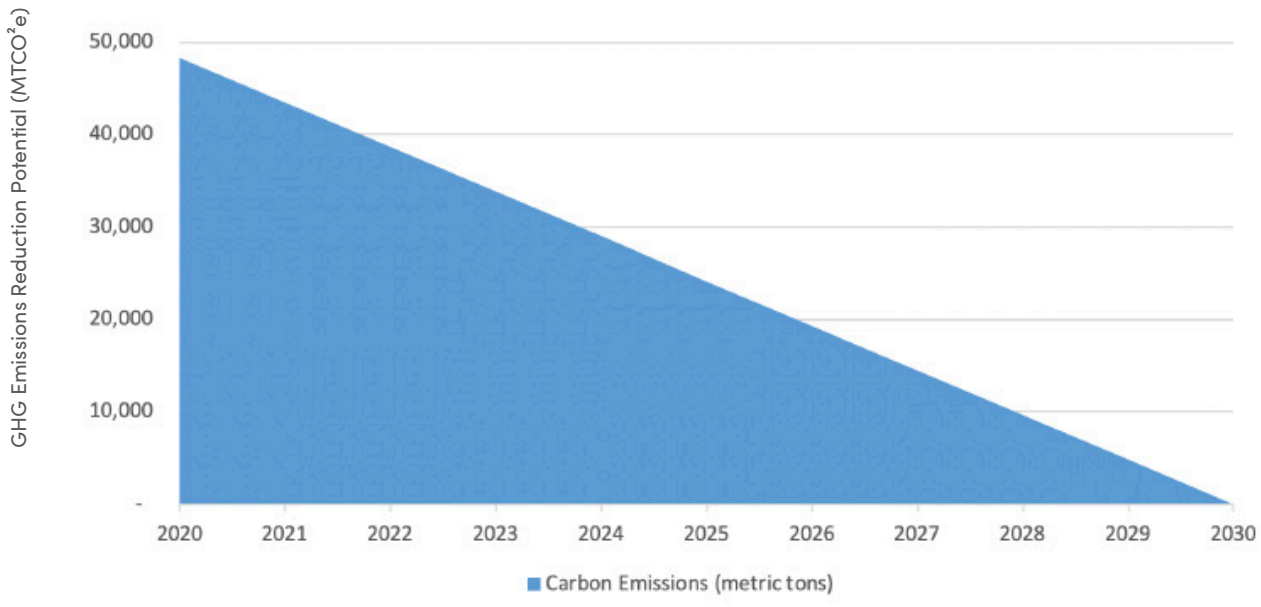
Greenhouse Gas Reduction Potential



48,300 metric tons carbon dioxide equivalent (2.2% of community-wide greenhouse gas emissions)

By 2030, the **Update Building Codes** strategy will have achieved all of its potential greenhouse gas emissions reductions.

UPDATE BUILDING CODES



3. POWER STREET LIGHTING AND TRAFFIC SIGNALS WITH LED

Lighting accounts for 15 percent of global energy use and a significant portion of municipal energy consumption in the form of lighting our streets for safety. The City has started converting streetlights in our community from conventional lights to LEDs, the most energy-efficient bulbs available. This can reduce energy usage by up to 70 percent, significantly reduce maintenance costs, and offer more control over when and how lights shine.

Vision for Powering Street Lighting and Traffic Signals with LED

By 2030 all of our community's public streetlights and traffic signals are LED.

Party Responsible for Implementation

- City of Ann Arbor Signs and Signals

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- DTE Energy

Equity Impacts

Few equity issues except slightly increased pedestrian safety.

Indicators of Success / Goals

By 2029, all streetlights and traffic signals have been converted to LEDs.

Assumptions

- City will gain ownership of 2/3 of the streetlights currently owned by utility
- 60% kWh savings by replacing 4,467 lights with LED lighting; Average savings are between 50-70%
- City will replace all traffic lights with LED; 85% efficiency savings
- City will assess/identify opportunity to replace all crosswalk lighting with LED efficient lighting

Target Demographic

This action applies to municipal streetlights, crosswalks, and outdoor lighting

Timeline and Initial Actions

2020

The City initiates negotiations with DTE Energy about purchasing streetlights.

2021

City begins purchasing streetlights and replacing with LEDs. Traffic signals are replaced on a rolling basis.

2029

Replacement of streetlights and traffic signals complete.





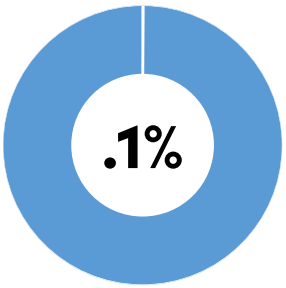
Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$3,100,000

including the cost to purchase the assets from DTE Energy and finance the conversion to LEDs.

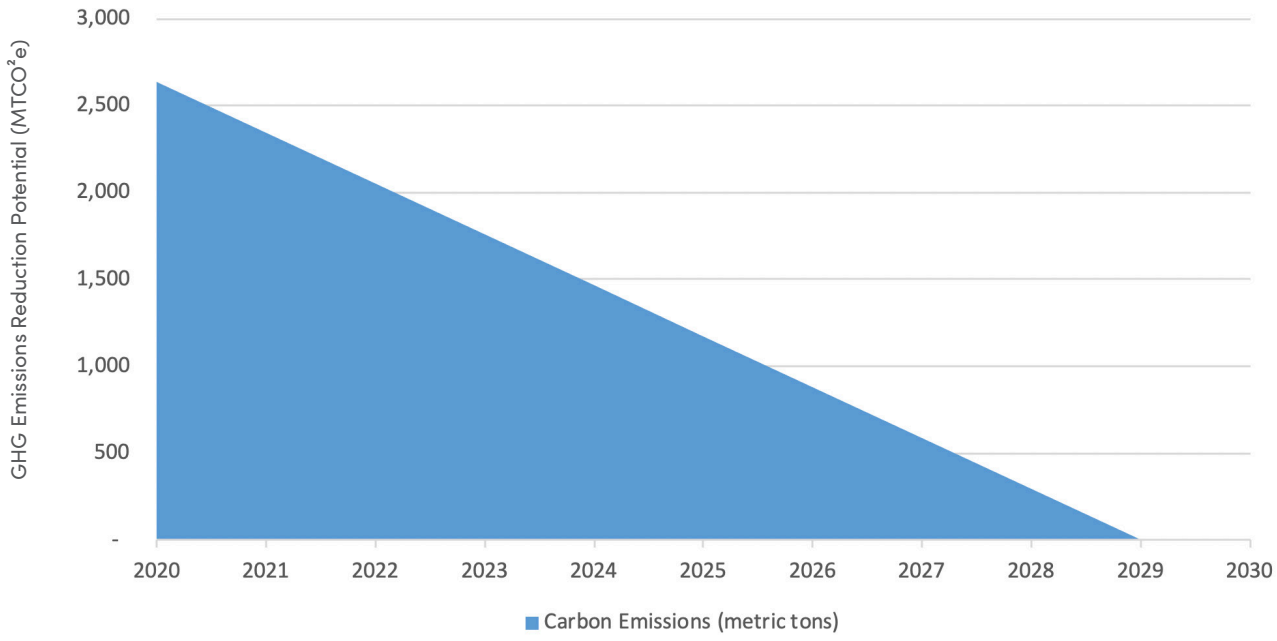
Greenhouse Gas Reduction Potential



2,600 metrics tons of carbon dioxide equivalent (.1% of community-wide emissions)

By 2029, the **Power Street Lighting and Traffic Signals with LED** strategy will have achieved all of its potential greenhouse gas emissions reductions.

POWER STREET LIGHTING AND TRAFFIC SIGNALS WITH LED



4. BENCHMARK AND DISCLOSE ENERGY USAGE

In order to understand our community's potential for and achievement of energy efficiency improvements, we need more granular information about how we use energy. Benchmarking, through the disclosure of energy usage, identifies where we can make the most significant impacts, and serves to motivate performance improvements.

Vision for Benchmarking and Disclosing Energy Usage

Through standardized energy audits and self-reporting, residents and businesses take ownership of their energy usage, and have worked towards significant energy improvements. Achievements have been recognized across sectors, and as a community we have reduced our energy usage by 20%.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Ann Arbor Information Technology Department
- Commercial property owners and tenant
- Real estate agents, brokers, and homeowners
- Energy auditors
- DTE Energy and Consumers Energy

Equity Impacts

Lower-income homeowners may suffer lower sales prices for their homes if they have inefficient homes. Rents may rise for highly efficient rental units, which may further exacerbate race and income disparities in the community.

Indicators of Success / Goals

Benchmarking requirements are passed, with 90% compliance by the residential, commercial, and institutional sectors by 2025.

Assumptions

- A back-end portal to automatically report energy usage is built between the utilities and the City
- Sufficient Code Enforcement staff exist to ensure compliance in the program
- Support resources are available to help building owners and tenants reduce energy after benchmarking; this initiative contributes to participation in other energy efficiency initiatives in this Plan

Target Demographic

Homeowners, landlords, businesses, and institutions

Timeline and Initial Actions

2021

Design program. Conduct building inventory for all sectors. Create reporting platform, educate, and pilot.

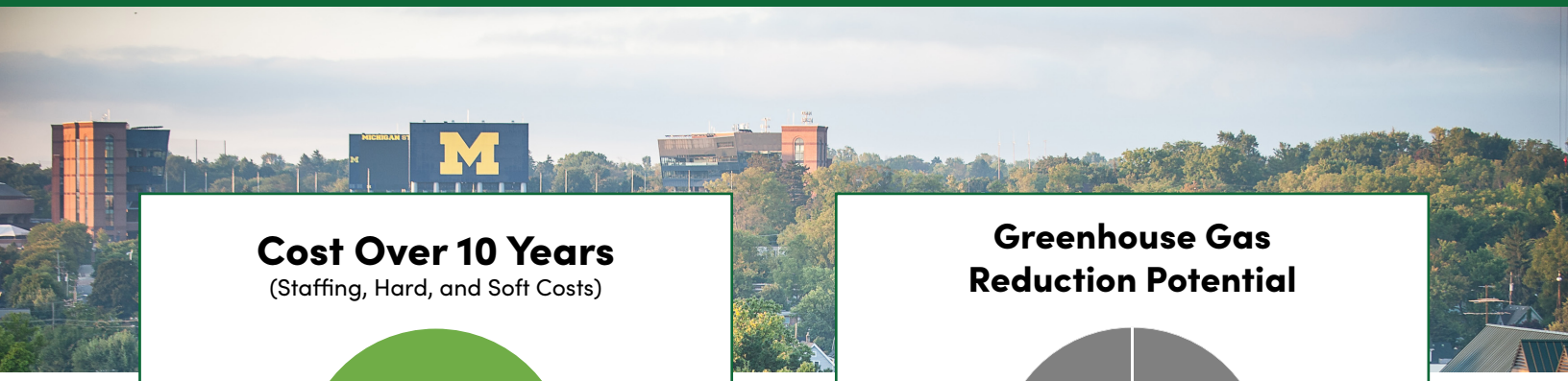
2022

Fully administer the program. Continually revisit customer service support, enforcement, and program administration for areas of improvement.

2025

Achieve 90% compliance in the residential, commercial, and institutional sectors.





Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$

$2,370,000

Greenhouse Gas Reduction Potential



Not assumed to directly reduce greenhouse emissions but action is foundational for work.

BENCHMARK AND DISCLOSE ENERGY USAGE



5. ESTABLISH LOAN LOSS RESERVE

Well-designed renewable energy, energy efficiency, and electrification improvements pay for themselves over their lifetime. However, the upfront cost of installation can be a barrier to many, especially to those who cannot secure financing. The City of Ann Arbor proposes establishing a loan loss reserve 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.

Vision for Establishing Loan Loss Reserve

All Ann Arborites can secure the financing they need, at a reasonable rate, to make the energy efficiency, renewable energy, and fuel switching activities needed to achieve carbon neutrality.

Party Responsible for Implementation

- Michigan Saves, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Local and regional banks
- Ann Arbor Finance Department

Equity Impacts

Homeowners with lower credit scores will benefit from the City establishing a loan loss reserve. Banks and Michigan Saves can lower the minimum credit scores needed to qualify for loans to do energy efficiency and renewable projects.

Indicators of Success / Goals

By 2021, Ann Arbor has created a $1,000,000 loan loss reserve fund that enables lenders to loan to low-income residents to undertake energy efficiency and renewable energy improvements.

Assumptions

- $1,000,000 is placed into a loan loss reserve to initiate the program
- Average loan terms of 6% APR over 10 years
- The seed funding has a leverage ratio of 1:20
- 5% default rates

Target Demographic

Low-income residents

Timeline and Initial Actions

2020

Meet with Michigan Saves to initiate concept. Work on program design and secure lenders.

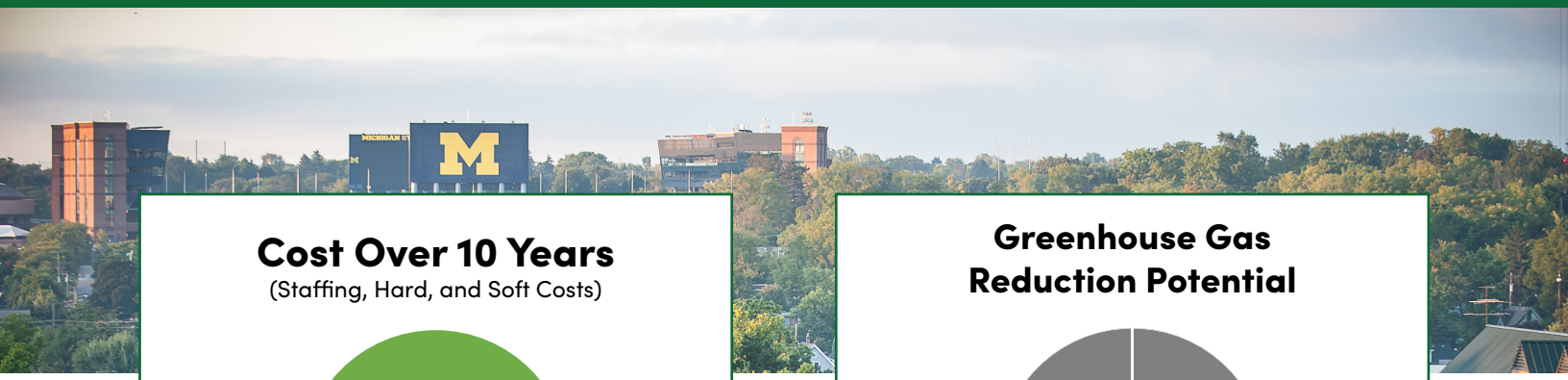
2021

Launch loan loss reserve.

2022

Monitor progress and revise.

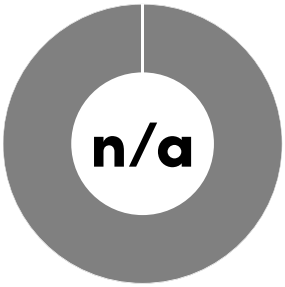




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$1,578,000

Greenhouse Gas Reduction Potential



This action does not directly lead to greenhouse gas reductions but contributes to the ability of residents and small businesses with lower credit scores being able to access financing for energy efficiency, renewable energy, electrification, and other activities outlined in this plan.

ESTABLISH LOAN LOSS RESERVE



6. DEVELOP ENERGY CONCIERGE AND COMMUNITY ENGAGEMENT PROGRAM

Many of the actions proposed rely on effective, inclusive, and accessible community engagement programs to reach the required levels of participation to achieve carbon neutrality. The City of Ann Arbor proposes creating an easy to use energy concierge service to help residents and businesses understand the best, highest impact, and most affordable methods to carry out greenhouse gas reduction activities.

Vision for Energy Concierge and Community Engagement

It is 2030, and through an easy to reach energy concierge service and effective, widespread community education, we have reached our carbon neutrality goal. Efforts to install renewable energy, improve energy efficiency, and transition away from fossil fuels have been coordinated at both a community-wide and individual level to ensure that we use the least amount of energy possible.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Contractors
- Michigan Saves
- Solarize Coordinator
- DTE Energy

Assumptions

- Programs are highlighted through the concierge that serve all members of our community
- High levels of outreach achieved for all sectors of our community

Equity Impacts

Property owners, including owners of rental housing, will primarily benefit from this program. Low-income residents may benefit from programs targeted to help them achieve energy savings.

Indicators of Success / Goals

By 2025, the Energy Concierge has helped 2,500 Ann Arborites access energy-related program, funding, and support resources, leading to the implementation of activities that have reduced community-wide greenhouse gas emissions.

Target Demographic

This action is foundational to the entire carbon neutrality effort, and includes all Ann Arborites

Timeline and Initial Actions

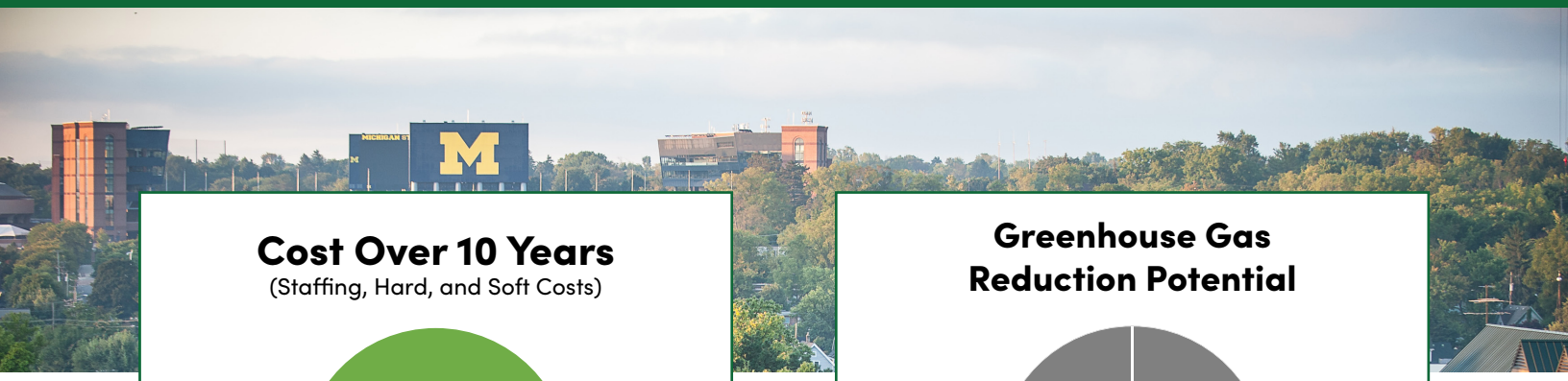
2021

The City develops an energy concierge and engagement program and soft launches

2022

The program continues to operate throughout the community even after carbon neutrality is achieved. The program is continuously improved based on community needs and emerging programs





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

$820,000

Greenhouse Gas Reduction Potential



This action does not directly lead to greenhouse gas reductions but contributes to the ability of residents and businesses to find, access, and implement energy efficiency, renewable energy, electrification, and other activities outlined in this Plan.

DEVELOP ENERGY CONCIERGE AND COMMUNITY ENGAGEMENT PROGRAM



7. TRANSITION AFFORDABLE HOUSING SITES TO NET ZERO ENERGY

Through a deep and collaborative partnership, the Office of Sustainability and Innovations and the Ann Arbor Housing Commission have been working to transition all existing and new affordable housing sites to net zero energy. These systems are also being designed to handle electric vehicle charging and battery storage.

Vision for Net Zero Energy Affordable Housing

Every affordable housing site in the City is net zero energy by 2030. Savings accrued through the program are directly invested in more programming for Housing Commission tenants and into more affordable housing sites.

Party Responsible for Implementation

- Office of Sustainability and Innovations, in partnership with Ann Arbor Housing Commission

Collaborators / Project Co-Designers

- UM Battery Lab
- Energy Contractors
- U.S. Housing and Urban Development
- DTE Energy

Equity Impacts

Ann Arbor Housing Commission funding that would have assisted in paying energy bills can be redirected to help meet Ann Arbor's annual affordable housing goals.

Indicators of Success / Goals

By 2030, every affordable housing site in the City is net zero energy.

Assumptions

- The Office of Sustainability and Innovations continues to provide $200,000 to support energy efficiency improvements and renewable energy at Housing Commission sites through 2021
- Starting in 2022 through 2025, the Office of Sustainability and Innovations provides $100,000 in direct support to the Housing Commission
- Fundraising is conducted to finance the rest of the energy improvements

Target Demographic

Those currently residing in affordable housing and those in need of affordable housing

Timeline and Initial Actions

2020

City continues partnership with AAHC to retrofit existing facilities to highest energy standards possible.

2021

City seeks external funding to support more rapid transition of sites.



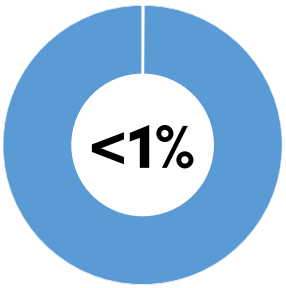


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$800,000

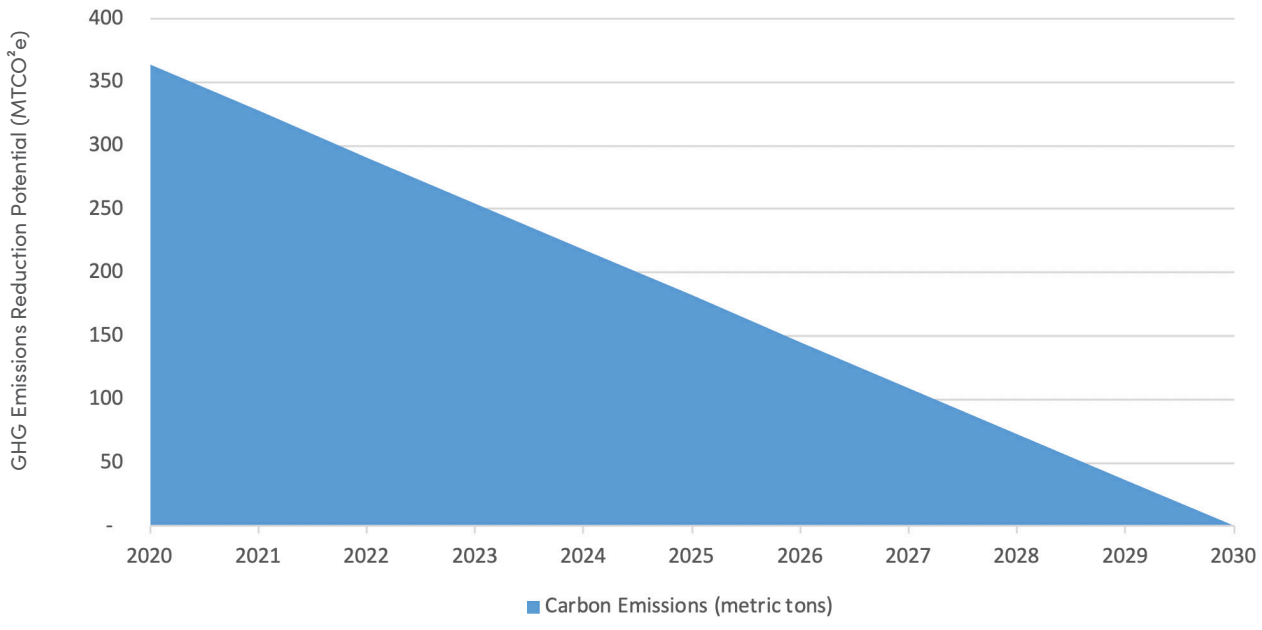
Greenhouse Gas Reduction Potential



400 metric tons of carbon dioxide equivalent (less than 1% of community-wide emissions)

By 2030, the **Transition Affordable Housing Sites to Net Zero Energy** strategy will have achieved all of its potential greenhouse gas emissions reductions.

TRANSITION AFFORDABLE HOUSING SITES TO NET ZERO ENERGY



8. PROMOTE GREEN RENTAL HOUSING PROGRAM

The Green Rental Housing Program improves energy efficiency and reduces greenhouse gas emissions associated with our rental buildings. Since rental units make up 55% of Ann Arbor's housing stock, actions in this area are vital to reducing greenhouse gas emissions. The Green Rental Housing program is accomplished by adding 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. Trainings, rebates, and financing support are provided as well to help transition rental units to greater efficiency.

Vision for Promoting Green Rental Housing Program

Renters are living in vastly more energy efficient homes and are saving on their energy bills and/or rents. Property owners are investing in the value of their properties and are seeing increased tenant retention and satisfaction.

Party Responsible for Implementation

- Office of Sustainability and Innovations and Community Services

Collaborators / Project Co-Designers

- Rocky Mountain Institute
- Urban Sustainability Directors Network
- University of Michigan's Beyond the Diag
- Washtenaw Area Apartment Association
- Michigan Saves
- DTE Energy

Equity Impacts

Renters in Ann Arbor may be able to rent more energy efficient homes as soon the ordinance goes into effect, and as more buildings become more energy efficient.

Indicators of Success / Goals

10% reduction in energy usage in rental properties within the City by 2030.

Assumptions

- We are able to integrate energy efficiency requirements into existing City rental licensing processes
- 80% compliance with the policy after the policy has been in effect for 4 years
- No net increase in average rents, outside of normal market inflation, 5 years post policy adoption

Target Demographic

Renters in Ann Arbor, with a special emphasis on low-income and student renters

Timeline and Initial Actions

2020

Stakeholder engagement and policy development commences.

2021

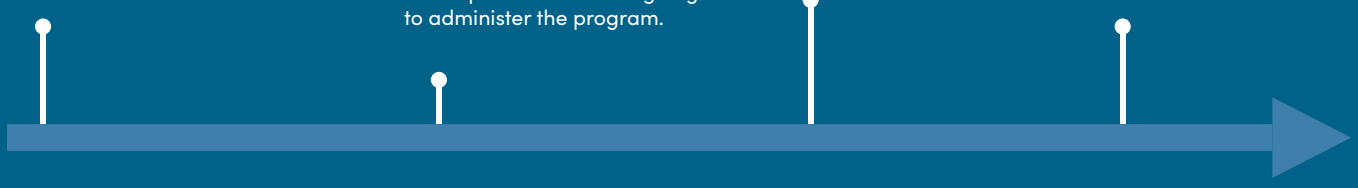
Policy brought forward and adopted by Council; workforce development and training begins to administer the program.

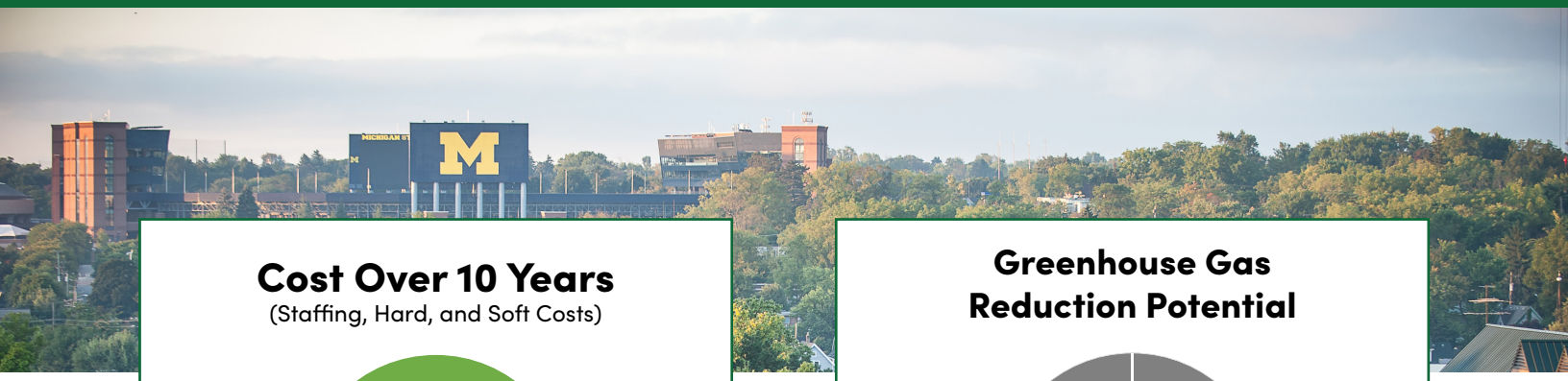
2022

Policy goes into effect.

2025

Policy reviewed and revised, if needed.





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

$530,000

Greenhouse Gas Reduction Potential



Impact of this action is included in other calculations.

PROMOTE GREEN RENTAL HOUSING PROGRAM



9. LAUNCH GREEN BUSINESS CHALLENGE

This action encourages our businesses to engage in more sustainable behaviors by providing technical assistance, guidance, and recognition to local businesses that voluntarily become more sustainable and lower their environmental footprint. At the core of the program are energy efficiency, renewable energy usage, waste reduction and material reuse, water reduction, and alternative transportation.

Vision for Launching Green Business Challenge

Ann Arbor businesses are some of the most sustainable in the nation, thanks in part to the City's Green Business Challenge. By providing incentives, guidance, and recognition for local businesses, the Green Business Challenge helped businesses lower their operating costs and reduce their environmental footprints. It has also increased support for the City's thriving small, medium, and large businesses.

Party Responsible for Implementation

- TheRide, with support from the Office of Sustainability and Innovations' Sustainability Analyst
- UM Transportation Department. with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Ann Arbor – Ypsilanti Regional Chamber of
- Commerce
- Ann Arbor SPARK
- Public Services
- DTE Energy
- Consumers Energy
- Ecology Center
- Huron River Watershed Council
- Michigan Saves
- Local banks
- Downtown Development Authority
- Ann Arbor 2030 District
- TheRide

Equity Impacts

Few equity impacts.

Indicators of Success / Goals

By 2025, participating businesses have reduced their energy consumption by 10%, increased waste diversion by 10%, reduced water consumption by 10%, and eliminated single-use plastics.

Assumptions

- 2030 District is a partner in educating and engaging/recruiting businesses
- 50 local businesses are participating by 2025

Target Demographic

Local businesses – initially those in the downtown but eventually any local business in town

Timeline and Initial Actions

2020

Launch Green Business Challenge stakeholder committee.

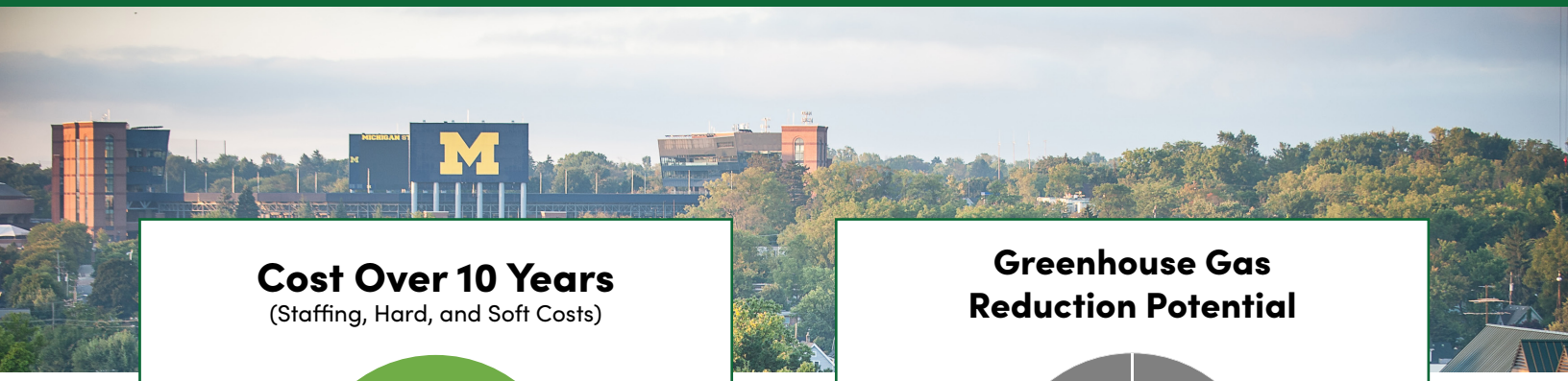
2021

Design the Challenge; recruit participants.

2022

Administer the first year of the Challenge.





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

$

$700,000

Greenhouse Gas Reduction Potential



Impact of this action is included in other calculations.

LAUNCH GREEN BUSINESS CHALLENGE



10. SUPPORT AGING IN PLACE EFFICIENTLY

The Aging in Place Efficiently program helps low-income seniors age in a place of their choosing for longer by providing physical and energy efficiency improvements to their residences. More specifically, this program aims to integrate energy efficiency improvements into a wide variety of existing services available to seniors in our community.

Vision for Supporting Aging in Place Efficiently

It is 2035 and all low-income seniors in our community have healthier outcomes. Thanks to physical improvements to their homes and energy efficiency upgrades that reduce their monthly expenditures, they are able to age gracefully and stay in their homes longer.

Party Responsible for Implementation

- Office of Sustainability and Innovations
- Washtenaw County Department of Community and Economic Development
- Meals on Wheels

Equity Impacts

This program will provide expanded weatherization services to a broader segment of low-income senior citizens than the County program is allowed to currently serve.

Collaborators / Project Co-Designers

- Local aging organizations
- Energy efficiency experts
- Michigan Saves
- Dr. Tony Reames
- DTE Energy
- Housing Bureau of Seniors
- City Transportation Team
- TheRide

Indicators of Success / Goals

By 2023, at least 20 low-income seniors have reduced their energy bills by at least 15% and are recording improved quality of life thanks to improvements made in the program.

Assumptions

- Funding is secured through Partners for Places Grant
- Existing partners continue to engage in the initiative
- The model proves scalable and replicable throughout the City and region

Target Demographic

Low-income seniors

Timeline and Initial Actions

2020

Apply for external funding to initiate program. If successful, hire program assistant.

2021

Pilot the program in Ann Arbor.

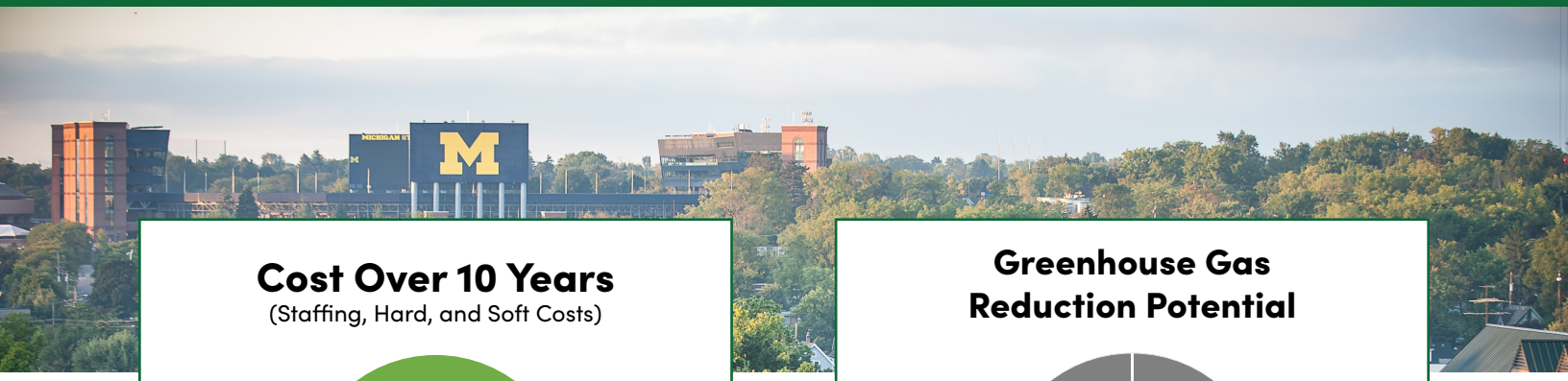
2022

Review, make revisions, and work with partners to expand in Ann Arbor and begin piloting throughout Washtenaw County.

2025

Program at full scale in the City and launched in the County.





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

$150,000

Greenhouse Gas Reduction Potential

n/a

Impact of this action is included in other calculations.

SUPPORT AGING IN PLACE EFFICIENTLY



11. EXPAND WEATHERIZATION PROGRAM

Washtenaw County and multiple nonprofits offer weatherization services to low-income homeowners in Ann Arbor. Weatherization is the practice of protecting a building and its interior from the elements, particularly from sunlight, precipitation, wind, and of modifying a building to reduce energy consumption and optimize energy efficiency. Through this program, the City of Ann Arbor will expand weatherization support so that more low-income homeowners can access these services.

Vision for Expanding Weatherization

By 2030, all low-income residents have been offered weatherization services.

Party Responsible for Implementation

- Washtenaw County Office of Community and Economic Development

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- Michigan Saves
- Ann Arbor Meals on Wheels
- Habitat for Humanity
- DTE Energy
- Consumers Energy

Equity Impacts

This program will expand weatherization services to more low-income Ann Arbor homeowners than can be served by the County weatherization program.

Indicators of Success / Goals

By 2030, all low-income residents in the City have been offered weatherization services.

Assumptions

- Expansion of weatherization includes funding to support electrification of homes
- Contract is passed by Council to support program and administering of funds to County to implement

Target Demographic

Low-income residents in Ann Arbor

Timeline and Initial Actions

2020

Background research into the number and needs of low-income homeowners in Ann Arbor; work with County Office of Community and Economic Development to design weatherization expansion program.

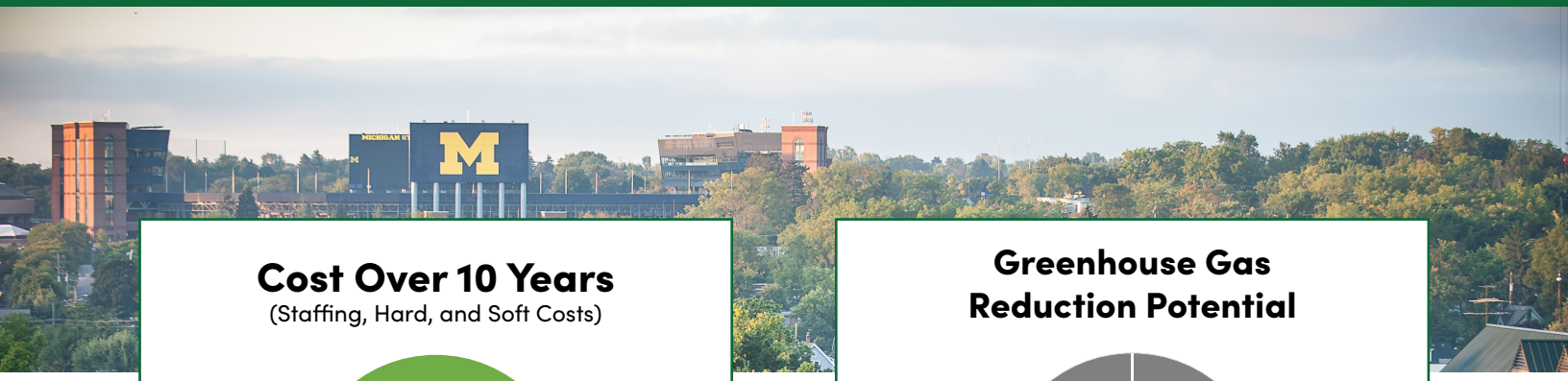
2021

Create operating agreements with Washtenaw County and pilot program.

2022

Review, make revisions, and work to serve more individuals in Ann Arbor.





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

$1,550,000

Greenhouse Gas Reduction Potential



Impact of this action is included in other calculations.

EXPAND WEATHERIZATION PROGRAM





STRATEGY 4:

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

This strategy focuses on reducing the miles we travel in our vehicles, regardless of type, by at least 50%. This is particularly important as emissions from transportation are on the rise, meaning that if we don't act to curtail this source, our greenhouse gas emissions reductions in other areas may be offset by gains in transportation-related emissions. To achieve this strategy, 7 specific actions have been identified:

1. Implement Non-Motorized Transportation Plan
2. Expand and Improve Local Transit
3. Expand and Improve Regional Transit
4. Increase Number of Park and Rides and Ensure Seamless Connection to Transit
5. Increase Diversity of Housing Allowed by Right
6. Establish Mixed-Use Neighborhoods
7. Tiered Parking Rates

Combined, these seven actions are projected to reduce just over 8% of community-wide emissions and cost just over $901,000,000 due to mainly physical infrastructure costs.

1. IMPLEMENT NON-MOTORIZED TRANSPORTATION PLAN

The City's Non-Motorized Transportation Plan was designed to ensure an interconnected network of options to achieve 25% of in-city trips through non-motorized transit. New infrastructure such as sidewalks, road crossings, separated bike lanes, streetlights, traffic devices, and connections between public transit and active transport modes will be needed to achieve this goal, which strongly overlaps with the A²Zero initiative.

Vision for Implementing Non-Motorized Transportation Plan

All Ann Arbor residents, employees, students, and visitors have safe, convenient, and enjoyable choices to move around the City, whether by foot, bicycle, or other self-propelled modes.

Party Responsible for Implementation

- Ann Arbor Engineering Department Transportation Team, with support from Ann Arbor City Council

Collaborators / Project Co-Designers

- Transportation Department
- Transportation Commission
- Planning Commission (Capital Improvement Plan)
- Downtown Development Authority
- Ann Arbor Area Transit Authority
- Michigan Department of Transportation
- Washtenaw Bicycling and Walking Coalition
- University of Michigan
- Smart City group
- Private micromobility companies
- Private employers

Equity Impacts

Residents who cannot afford to buy and maintain private automobiles often bike, walk, or travel by micromobility modes. Investing in new infrastructure will enable those already using non-motorized modes of travel to have safer, more convenient, and faster trips. These investments will also encourage more residents to travel by bike or foot. However, pedestrians and cyclists are often vulnerable road users, and have faced increasing injuries and deaths from traffic collisions. Safe, ubiquitous infrastructure is needed.

Indicators of Success / Goals

By 2030, 25% of in-city trips are conduct by walking or bicycling thanks to ubiquitous and safe infrastructure.

Assumptions

- 25% of in-city trips are done with bicycling and walking
- These trips are in-city trips only
- 5 miles of new bike lanes installed per year – the majority are protected
- At least 5 major mid-block crosswalks and 2 minor mid-block cross-walks installed per year
- 90% of sidewalk gaps are filled by 2030

Target Demographic

Implementing the Non-Motorized Transportation Plan will primarily benefit pedestrians and bicyclists, although the increased safety and access to infrastructure will also reduce vehicle collisions. Drivers will also benefit from less congested streets as people switch to walking and biking

Timeline and Initial Actions

2020

Continue implementing elements on the Non-Motorized Plan. Finalize the VisionZero Transportation Plan update.

2021

Continue hosting public meetings to understand weaknesses in current infrastructure and opportunities for improvement.

2026

Full implementation of the Non-Motorized Transportation Plan.



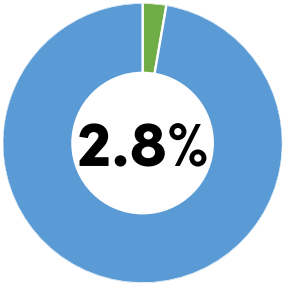


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$2,400,000

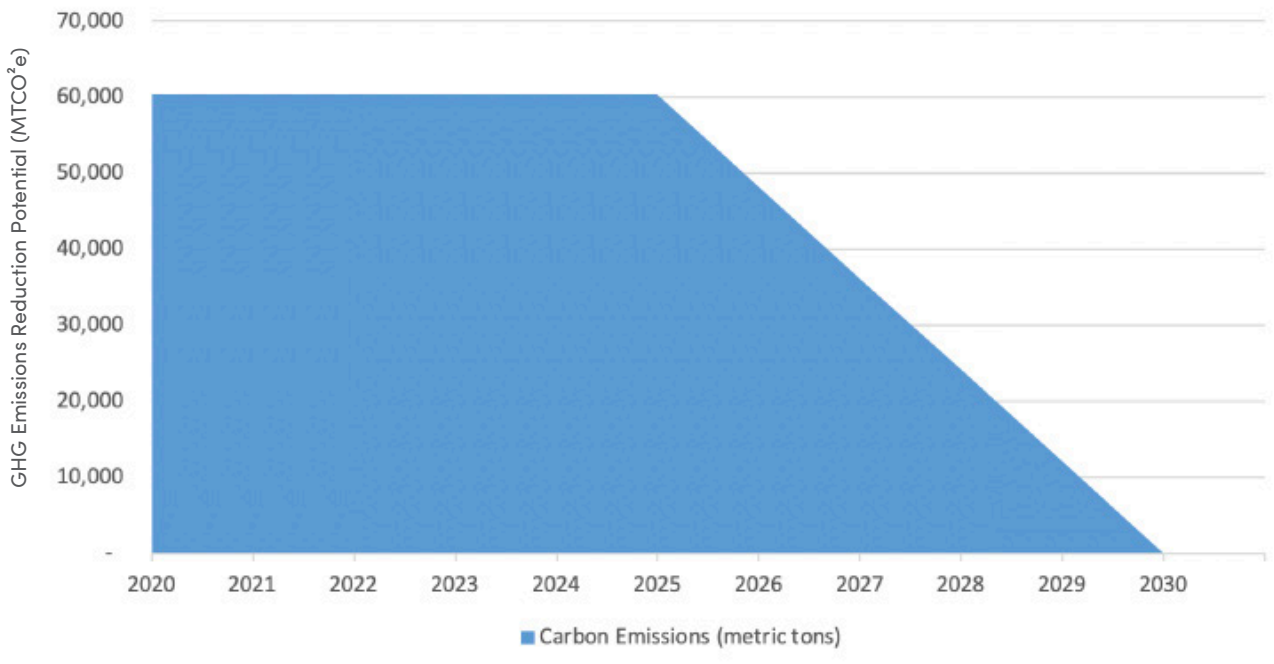
Greenhouse Gas Reduction Potential



60,400 metric tons carbon dioxide equivalent (2.8% of community-wide emissions).

By 2030, the **Implement Non-Motorized Transportation Plan** strategy will have achieved all of its potential greenhouse gas emissions reductions.

IMPLEMENT NON-MOTORIZED TRANSPORTATION PLAN



2. EXPAND AND IMPROVE LOCAL TRANSIT

An extremely common theme during public outreach was the need to expand and improve local transit services. Ideas suggested included longer service, new service routes, dedicated bus lines and bus rapid transit along major transportation corridors, and expanding the Get Downtown Program to companies outside of downtown. This action focuses on how we can expand and improve transit service with the aim of significantly increasing ridership.

Vision for Expanding and Improving Local Transit

By 2030, ninety-five percent of Ann Arbor residents have access to transit within a 10 minute walk with frequencies of 20 minutes or faster. This leads to residents taking transit for 40% of their journeys to work. This extensive transit service is powered with electric vehicles, all fueled with renewable energy.

Party Responsible for Implementation

- Ann Arbor Area Transit Authority, with support from the Regional Transit Authority of Southeast Michigan

Collaborators / Project Co-Designers

- Ann Arbor Transportation Commission
- Southeast Michigan Council of Governments (SEMCOG)
- Washtenaw Area Transportation Study (WATS)
- Federal Transit Administration (FTA)
- Senator Stabenow, Senator Peters, and
- Congresswoman Dingle
- Downtown Development Authority (DDA)
- University of Michigan
- Michigan Department of Transportation (MDOT) SPARK
- Ann Arbor 2030 District
- Ann Arbor Engineering Department
- Transportation Team
- Private employers

Target Demographic

All residents of Ann Arbor

Equity Impacts

Those who stand to benefit the most are those who may not have access to many forms of transportation due to disability, age, or income. The entire community can become economically stronger and more resilient from investments such as improved transit since investments in public transportation generate 31 percent more jobs per dollar than new construction of roads and bridges. Since property values tend to increase with new transit investments which would directly benefit property owners, it is important to find ways of keeping fares low for these new services so low-income residents are not disproportionately burdened by these improvements.

Indicators of Success / Goals

Residents take transit for 40% of their journeys not done through walking and biking.

Timeline and Initial Actions

2020

Vision Zero Transportation Master Plan is finished and adopted by Council. Work with AAATA to include bus rapid transit, electric buses, and solar, in millage renewal.

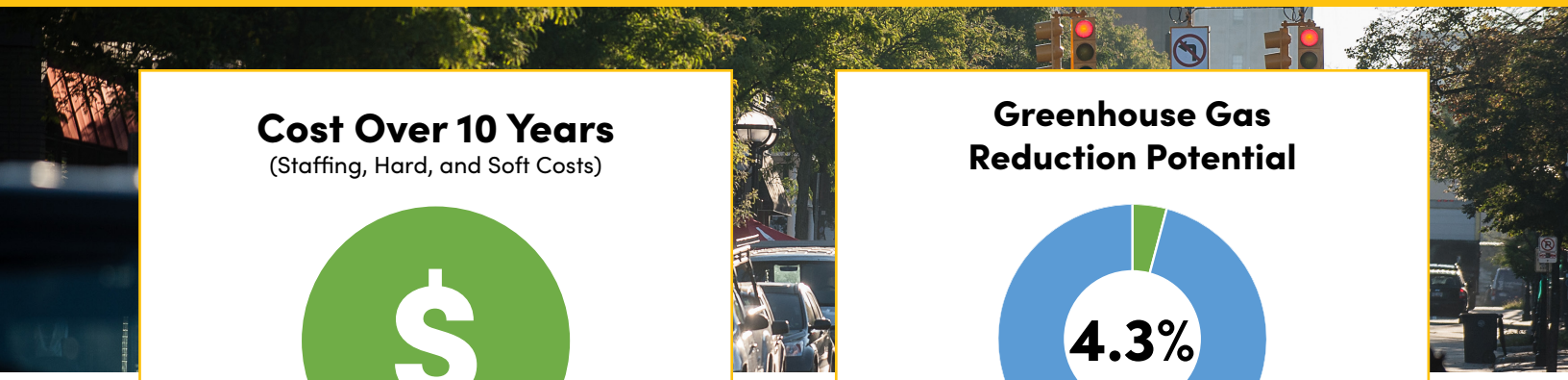
2021

The Get Downtown Program is expanded to include all businesses with more than 20 employees in Ann Arbor, and also to Ann Arbor residents who ae not working for a participating company.

2030

Bus Rapid Transit is built along transportation corridors.



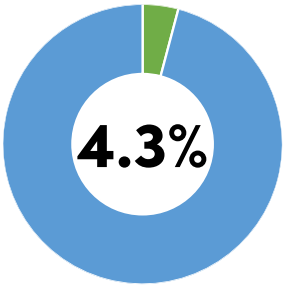


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$656,780,000

Greenhouse Gas Reduction Potential



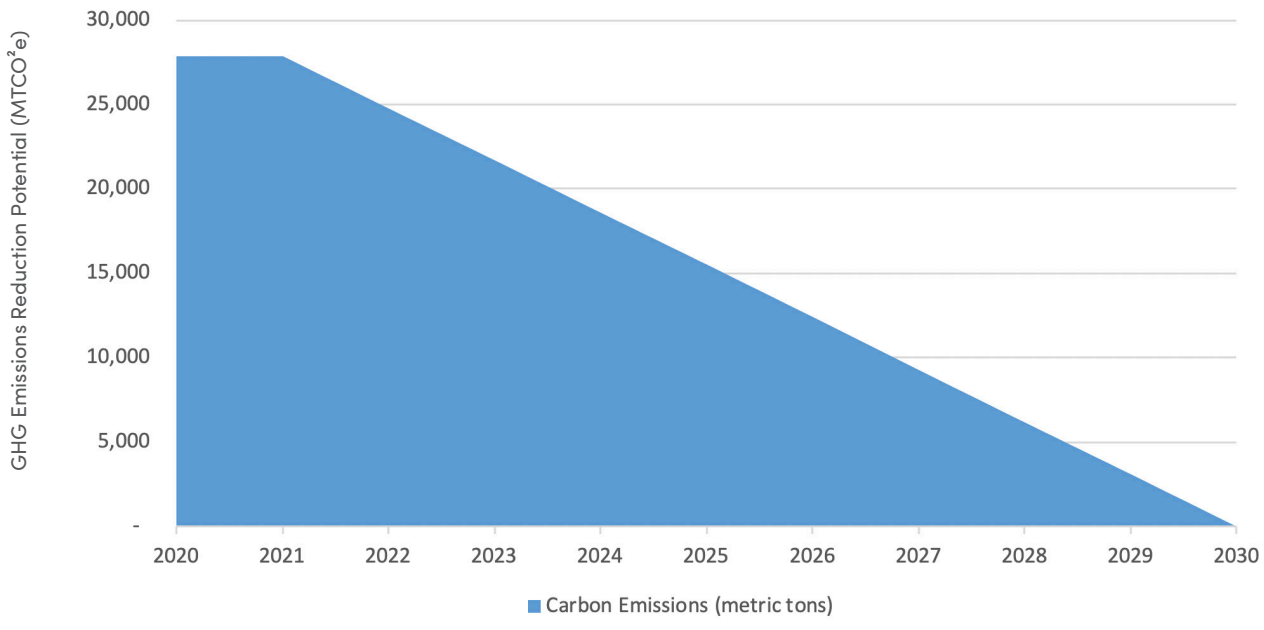
93,200 metric tons carbon dioxide equivalent (4.3% of community-wide emissions).

Assumptions

- Quadrupling of current bus ridership, with the average of 3.5 miles per trip
- Includes costs of new bus rapid transit lines
- Weekday bus rapid transit trips are assumed to run along routes of roughly 8 miles, for 5 days a week, or 48 weeks
- Weekend bus rapid transit trips are assumed to run along routes of roughly 8 miles, for 2 days a week,
- for 52 weeks
- Includes 22 queue jump facilities for regular buses
- Includes stop amenities and signal priority equipment for priority corridors
- Only calculates emissions reductions starting at the border of Ann Arbor (note: staff are working to gather comprehensive origin and destination data to update these figures)
- 2 new electric buses a year for 10 years added to the fleet to expand service

By 2030, the **Expand and Improve Local Transit** strategy will have achieved all of its potential greenhouse gas emissions reductions.

EXPAND AND IMPROVE LOCAL TRANSIT



3. EXPAND AND IMPROVE REGIONAL TRANSIT

Upwards of 80,000 individuals commute into Ann Arbor on any given day for work, school, or recreation. Regional transit service can help significantly reduce these numbers, thereby decongesting roads, improving local health, and reducing stress. Regional transit service into and from Plymouth, Jackson, Detroit, Brighton, Ypsilanti, and Ypsilanti Township are the areas prioritized at this time.

Vision for Expanding and Improving Regional Transit

By 2030, a high capacity transit and express transit system exists that connects Ann Arbor with nearby jurisdictions such as Detroit, Ypsilanti, Chelsea, and Brighton. Twenty-five percent of commuter trips into and out of Ann Arbor occur through these highly effective regional transit services.

Party Responsible for Implementation

- Ann Arbor Area Transit Authority, with support from the Regional Transit Authority of Southeast Michigan

Collaborators / Project Co-Designers

- Engineering Department Transportation Group
- Washtenaw, Oakland, and Wayne counties and the cities and townships in those counties
- Ann Arbor Transportation Commission
- Southeast Michigan Council of Governments
- Washtenaw Area Transportation Study (WATS)
- Federal Transit Administration
- Federal Railroad Administration WATCO
- Senator Stabenow, Senator Peters, and
- Congresswoman Dingell
- University of Michigan
- Michigan Department

Equity Impacts

High capacity regional transit and express transit will primarily benefit commuters to and from Ann Arbor. Such service would broaden opportunities and access to jobs for those without access to other forms of transportation. Quality regional transit can also attract occasional riders and all-purpose riders who find it desirable to take transit to and from Ann Arbor to avoid traffic, parking fees, and the hassles of driving. It will be important to ensure that low-income riders have convenient and affordable access to expanded transit opportunites.

Indicators of Success / Goals

By 2030, 25% of the regional commuting trips into the City are done via regional transit options.

Assumptions

- Bus rapid transit lines are created and can be utilized by regional transit lines
- The average regional trip is 8 miles or less, running 5 days a week for 48 weeks
- 25% of the commuter trips will be taken by regional transit
- Includes calculations related to supporting more work from home programs. Estimated 5% participation
- rate for those with a one-way commute of 10 miles or less and a 10% participation rate for those with a
- one-way commute of 11 miles or more.

Target Demographic

Regional transit will primarily benefit people who work or school in Ann Arbor and the jurisdictions where transit stops exist

Timeline and Initial Actions

2020

Work with AAATA to include bus rapid transit, electric buses, and solar, in millage renewal. Regional transit to Detroit is established.

2021

Regional transit to surrounding municipalities is established.





Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$

The majority of costs for this action are covered in other actions.

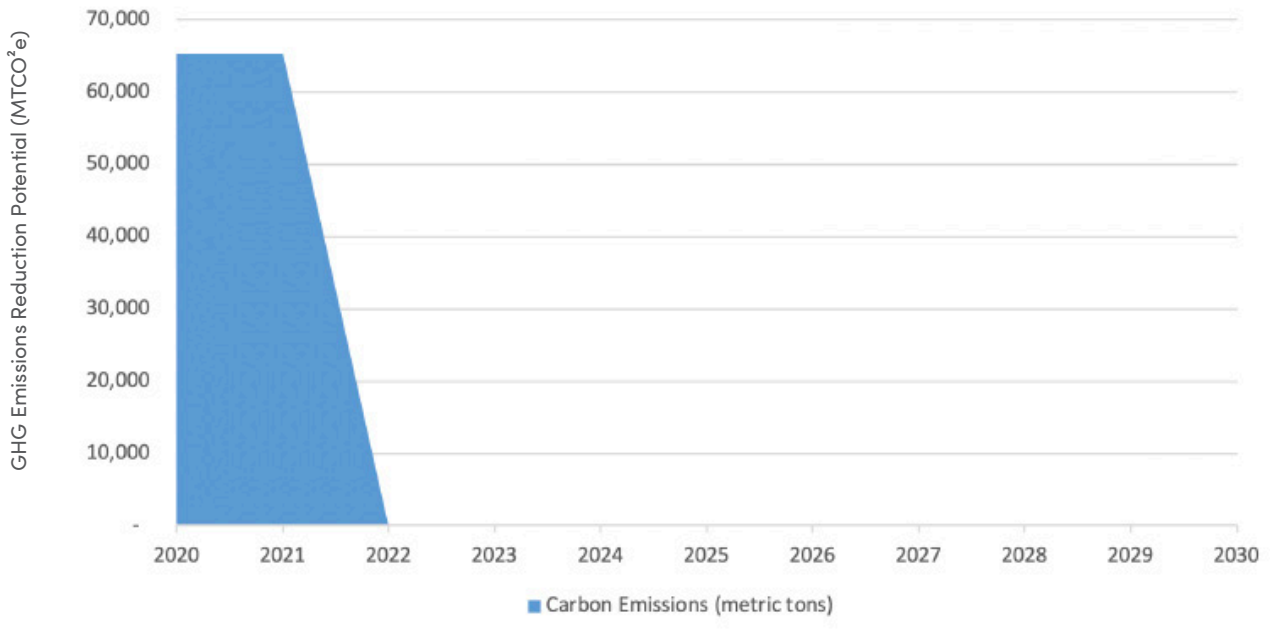
Greenhouse Gas Reduction Potential



The greenhouse gas reduction potential of this action in captured in other actions

By 2022, the **Expand and Improve Regional Transit** strategy will have achieved all of its potential greenhouse gas emissions reductions.

EXPAND AND IMPROVE REGIONAL TRANSIT



4. INCREASE NUMBER OF PARK AND RIDES AND ENSURE SEAMLESS CONNECTION TO TRANSIT

More than 80,000 individuals commute into the City every day for work, school, or recreation. Intercepting people as soon as they arrive and diverting vehicular traffic to park and rides that provide electric vehicle charging and seamless connection to public transit so they can rapidly get to where they need to go is an important component of reducing vehicular miles traveled in the city. Right now, there are just over 1,300 available free Park and Ride parking spaces. We propose at least a 10x increase in the number of spots to reduce in-city traffic.

Vision for Increasing Park and Rides with Seamless Connection to Transit

Through a significant increase in park and ride infrastructure that is seamlessly connected to transit, we have displaced 25% of commuter trips into the City.

Party Responsible for Implementation

- Michigan Department of Transportation with support from the Ann Arbor Area Transit Authority

Collaborators / Project Co-Designers

- Engineering Department Transportation Group
- Downtown Development Authority
- Washtenaw Area Transportation Study
- Employers
- Transportation

Equity Impacts

Park and Rides primarily benefit commuters coming into Ann Arbor, including low-income residents of nearby towns. Parking at Park and Rides would remain free, which would save drivers money, as compared to paying for parking downtown.

Indicators of Success / Goals

By 2030, commuter trips from the border of the City to their destination within the City has declined by 25%.

Assumptions

- 10x more parking spots are provided at park and rides; These spots are free
- Increased transit ridership accounted for in other actions
- Integrates demand management programs such as carpooling and ridesharing

Target Demographic

Transit riders, bicyclists, pedestrians, and car drivers would all benefit from reduced traffic congestion in the downtown core and by major work and educational centers

Timeline and Initial Actions

2020

Initiate planning for desired park and ride locations.

2021

Begin working with MDOT to acquire necessary properties and fundraise for infrastructure costs.

2023

Begin building new park and ride lots.





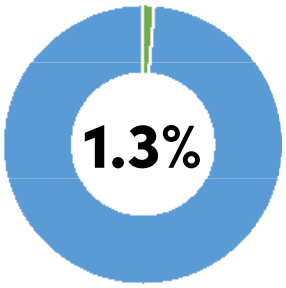
Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$170,000,000

(Note: This does not include the costs to purchase the land on which park and rides will reside)

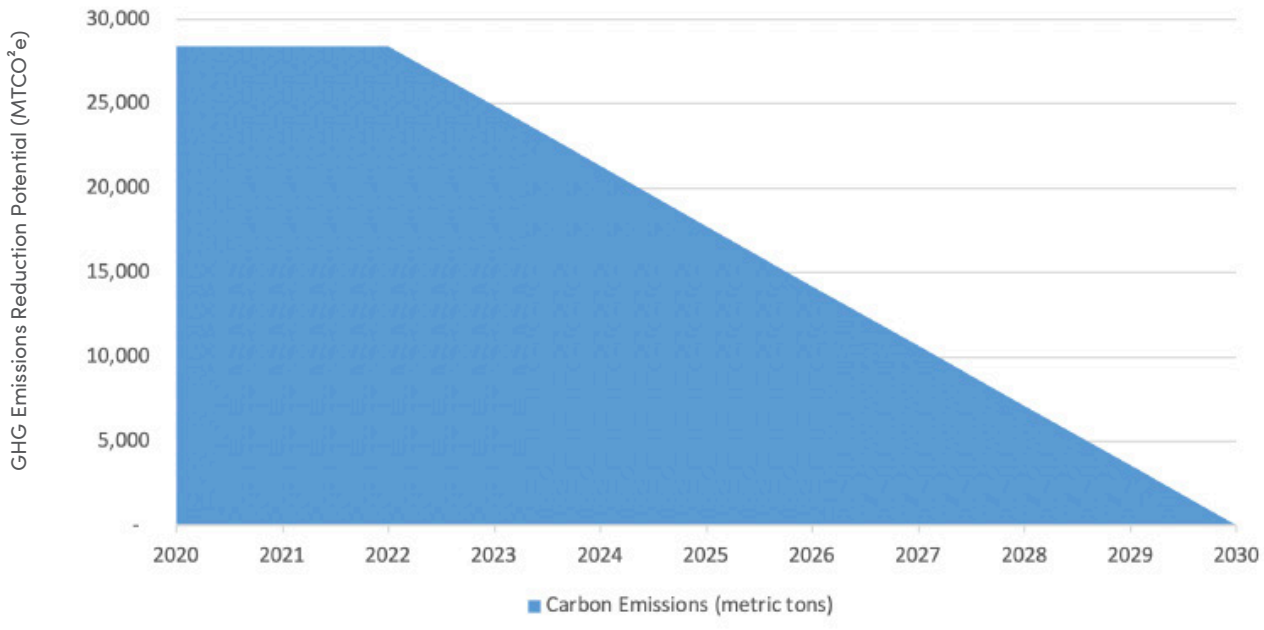
Greenhouse Gas Reduction Potential



28,400 metric tons carbon dioxide equivalent (1.3% of community-wide emissions).

By 2030, the **Increase Number of Park and Rides and Ensure Seamless Connection to Transit** strategy will have achieved all of its potential greenhouse gas emissions reductions.

INCREASE NUMBER OF PARK AND RIDES AND ENSURE SEAMLESS CONNECTION TO TRANSIT



5. INCREASE THE DIVERSITY OF HOUSING

This action focuses on supporting policies to increase housing opportunities within the City. This action was identified numerous times as a way to reduce greenhouse gas emissions, diversify housing options, and address affordability concerns. Overall, this action focuses on increasing the walkability and livability of neighborhoods while creating more accessible housing to a wider array of community members.

Vision for Increasing the Diversity of Housing

Ann Arbor neighborhoods grow slightly while maintaining their character and charm. Ann Arbor begins meeting its goal for reducing single occupancy trips by half while making notable progress toward providing more accessible and afforable housing.

Party Responsible for Implementation

- Ann Arbor Planning Department, with support from the Planning Commission and City Council

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- Ann Arbor Housing Alliance
- Ann Arbor Historic District Commission

Equity Impacts

Allowing multi-units and promoting ADUs will benefit renters, lower-income residents, in-commuters, and project developers. Reduced income disparity benefits all of Ann Arbor, both socially and economically.

Indicators of Success / Goals

2,000 new units of residential multi-family or ADUs are built in residential neighborhoods by 2030.

Assumptions

- City Council will approve an updated Comprehensive Master Plan
- 7-10% increase in housing availability
- Reduces new occupants commute by 20 miles each way and increases public transit usage
- 85% of new residential units are in mixed use areas

Target Demographic

Renters and property owners

Timeline and Initial Actions

2020

Initiate Comprehensive Master Plan Update.

2021

Complete Comprehensive Master Plan Update. Start working on corresponding zoning amendments.

2024

Zoning code amendments are adopted and implementation begins.

2028

Planning staff and Planning Commission review the code and make suggestions to Council for changes.

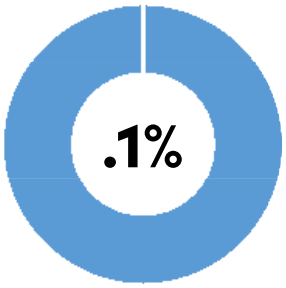




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$250,000

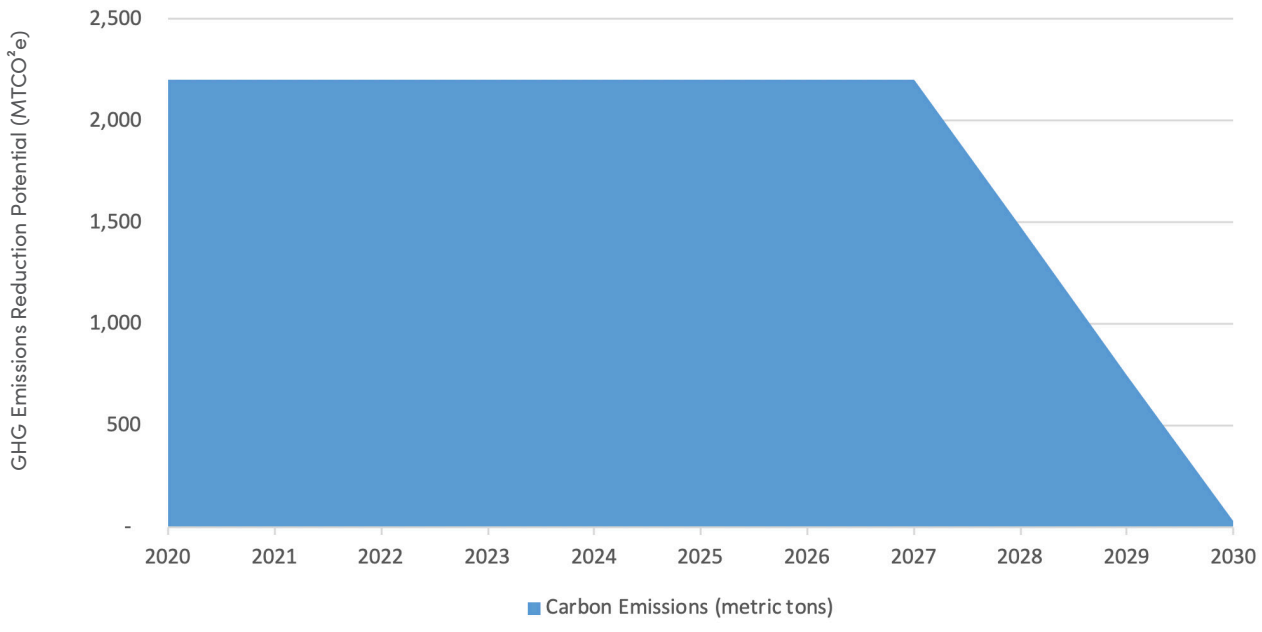
Greenhouse Gas Reduction Potential



2,200 metric tons of carbon dioxide equivalent (.1% of community-wide emissions)

By 2030, the **Increase the Diversity of Housing** strategy will have achieved all of its potential greenhouse gas emissions reductions.

INCREASE THE DIVERSITY OF HOUSING



6. DEVELOP MIXED-USE NEIGHBORHOODS

Helping residents 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 updating the zoning code to allow mixed-uses in residential neighborhoods so that things such as bakeries, grocery stories, breweries, coffee shops, etc. can be accessible in nearly all of our neighborhoods. This increases walkability and reduces vehicular miles driven.

Vision for Developing Mixed-Use Neighborhoods

More errands and entertainment are accessible by foot and bike thanks to mixed-use zoning, which has allowed us to maintain the integrity of Ann Arbor's neighborhoods while adding in amenities that enhance quality of life.

Party Responsible for Implementation

- Ann Arbor Planning Department, with support from the Planning Commission and City Council

Collaborators / Project Co-Designers

- Neighborhood associations
- Local businesses
- Ann Arbor Historic District Commission

Equity Impacts

Increasing mixed-use zoning positively impacts residents and small business owners in mixed use neighborhoods.

Indicators of Success / Goals

By 2030, 20% of in-city trips are done by walking or biking

Assumptions

- Increased social cohesion
- Increased walking and biking
- Reduced driving and car ownership in mixed use neighborhoods

Target Demographic

Residents and small business owners

Timeline and Initial Actions

2020

Initiate Comprehensive Master Plan Update.

2021

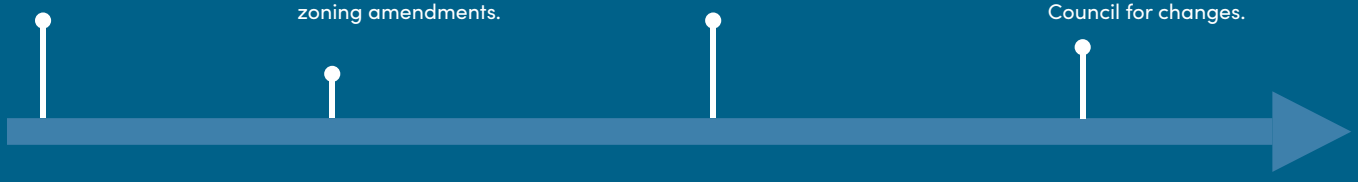
Complete Comprehensive Master Plan Update. Start working on corresponding zoning amendments.

2024

Zoning code amendments are adopted and implementation begins.

2028

Planning staff and Planning Commission review the code and make suggestions to Council for changes.





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

$

$365,000

Greenhouse Gas Reduction Potential



Emissions reduction potential included in other actions.

DEVELOP MIXED-USE NEIGHBORHOODS



7. ESTABLISH TIERED PARKING RATES

This action focuses on dis-incentivizing driving into the City by having a sliding parking fee structure that increases the cost to park, but has lower rates for low-income residents, residents with disabilities/specific parking needs, and electric vehicle drivers. This includes deploying smart metering and establishing dynamic pricing. Excess on-street parking in the DDA will be removed and replaced with more beneficial street uses, such as infrastructure for pedestrians, bicyclists, transit, and street activities (such as outdoor restaurant seating). Action includes eliminating all parking minimums and setting low parking maximums through the Plan review process.

Vision for Establishing Tiered Parking Rates

Many city streets will be transformed into Complete Streets through the repurposing of on-street parking to more active and pedestrian friendly activities.

Party Responsible for Implementation

- Downtown Development Authority with the Ann Arbor Engineering Department Transportation Group

Collaborators / Project Co-Designers

- Michigan Department of Transportation
- Office of Sustainability and Innovations
- Transportation Commission
- Ann Arbor 2030 District
- Ann Arbor Area Transit Authority
- Ann Arbor Smart City group
- University of Michigan
- Planning Department
- Planning Commission
- US Department of Transportation

Equity Impacts

Biking and walking become safer and more convenient ways to get around, which will open more mobility options for lower-income residents who cannot afford a car. For lower-income residents who must drive, parking rates will be tiered so as to offer lower cost options.

Indicators of Success / Goals

10% increase in walking and biking in the downtown corridor.

Assumptions

- More transportation users help active and sustain transportation modes
- Reduced parking rates for EV drivers and for low-income drivers

Target Demographic

This action will prioritize users of active and sustainable transportation modes

Timeline and Initial Actions

2020

Investigate what equipment and software other cities have used to enable dynamic parking rates.

2021

Develop a partnership to launch new parking technology and pilot dynamic parking rates somewhere in the DDA; eliminate parking minimums in UDC and replace with parking maximums.

2022

Full scale launch of tiered rates.





Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$

$4,500,000

Greenhouse Gas Reduction Potential



Emissions reduction potential included in other actions.





STRATEGY 5:

Change the Way We Use, Reuse, and Dispose of Materials

This strategy focuses on changing our relationship with what we buy and use, how we buy and use materials, and how we dispose of materials once we are done using them. The calculations in this section only focus on the greenhouse gas savings associated with reducing the disposal of materials and products. City staff will continue working on a methodology to capture upstream emissions associated with extracting and creating the goods and materials we use. For now, however, upstream emissions are not included in calculations. To achieve this strategy, six specific actions have been identified:

1. Expand Composting Program
2. Expand Commercial Recycling
3. Require Sustainable Materials in New and Existing Developments
4. Move Toward a Circular Economy
5. Support a Plant Rich Diet
6. Enhance Refrigerant Recycling and Reuse Program

Combined, these six actions reduce baseline community-wide greenhouse gas emissions by 0.3% and cost just over $45,000,000.

1. EXPAND COMPOSTING PROGRAM

The action focuses on moving to year round composting, which includes diverting food and yard waste from the waste stream into more productive uses in our compost system. This reduces methane emissions and helps produce valuable compost that can be used locally.

Vision for Expanding Compost Program

As food waste gets discarded as compost there's a gross reduction in the amount of methane produced from rotting food and a reduced impact on our GHG production.

Party Responsible for Implementation

- Department of Public Works

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- Food collection and distribution organizations
- Restaurants
- Communication Department

Equity Impacts

Through the new market for imperfect produce, low-income residents could benefit from being able to access more affordable fruits and vegetables.

Indicators of Success / Goals

By 2022, year round and commercial composting has led to over 5,000 tons of yard and food waste being diverted from our waste stream annually.

Assumptions

- Solid Waste Resource Management Plan (SWRMP) estimates that increasing to year round composting would put collection at 1,000 – 2,784 tons
- SWRMP estimates increasing collection of food from food-related businesses would add another 1,000– 2,400 tons per year
- Includes creating markets for imperfect fruit and vegetables to ensure they don't enter waste stream
- Increased education to ensure food waste doesn't freeze to cart
- Necessitates changes in the downtown area to allow compost pick-up; These costs are not factored into the cost estimate below

Target Demographic

All business and residences in Ann Arbor

Timeline and Initial Actions

2020

Adoption of a Solid Waste Resource Management Plan or at least elements related to compost expansion.

2021

Year round composting begins along with extensive outreach and engagement with businesses and residents about what is compostable and what is not.

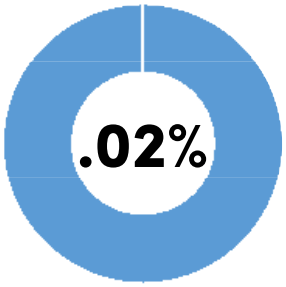




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$26,000,000

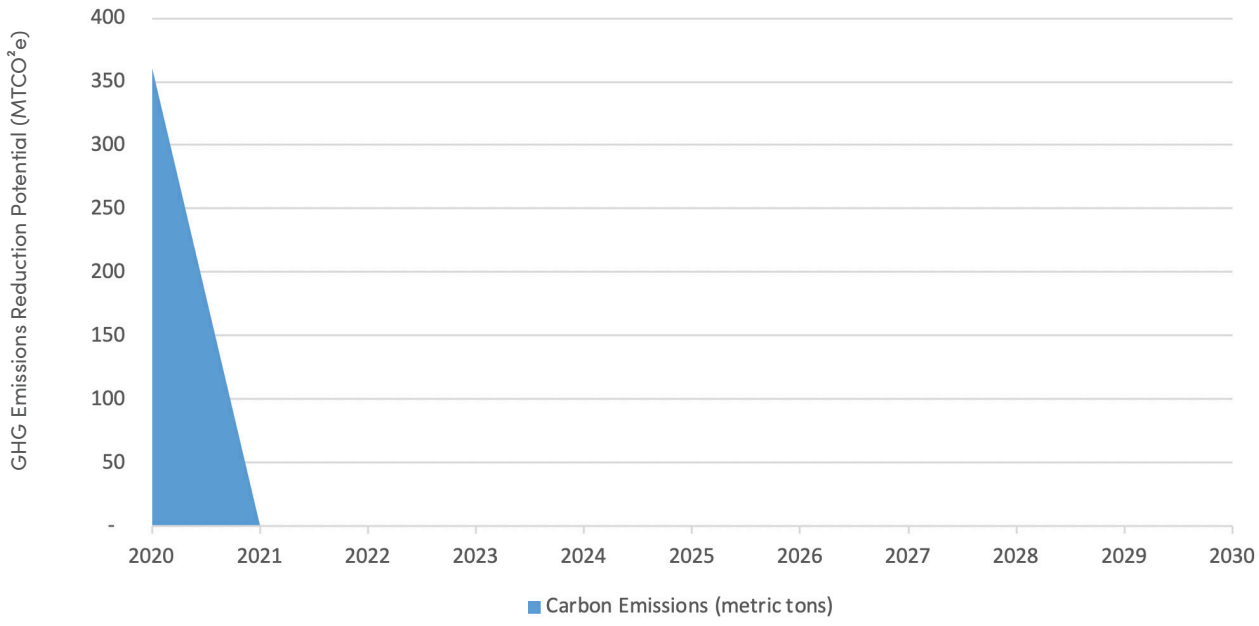
Greenhouse Gas Reduction Potential



400 metric tons carbon dioxide equivalent
(.02% of community-wide emissions)

By 2021, the **Expand Composting Program** strategy will have achieved all of its potential greenhouse gas emissions reductions.

EXPAND COMPOSTING PROGRAM



2. EXPAND COMMERCIAL RECYCLING

Through incentives, education, and enforcement policies, this action focuses on getting commercial sector recycling rates to at least 30%.

Vision for Expanding Commercial Recycling

The Solid Waste Resource Management Plan (SWRMP) estimates a range of 1700 to 4400 tons of waste diverted from landfill as a result of increased participation in commercial sector recycling.

Party Responsible for Implementation

- Department of Public Works, with support from Resource Recycling Associates

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- Commercial businesses
- State of Michigan

Equity Impacts

No equity impacts explicitly identified.

Indicators of Success / Goals

By 2028, City of Ann Arbor diverts 30% of commercial sector recyclable waste from the landfill to recycling centers.

Assumptions

- Requiring recycling at restaurants will increase recycling rates in the commercial sector
- Businesses will divert more recyclables from landfill
- Commercial sector diversion rate is 4,400 annual tons
- Increase in enforcement of commercial establishments who don't recycle and compost

Target Demographic

Ann Arbor businesses

Timeline and Initial Actions

2020

Adoption of a Solid Waste Resource Management Plan, or at least elements related to expanding commercial recycling, and education begins.

2021

Policies enacted and formal enforcement begins along with extensive outreach and engagement with businesses about what is recyclable and what is not.



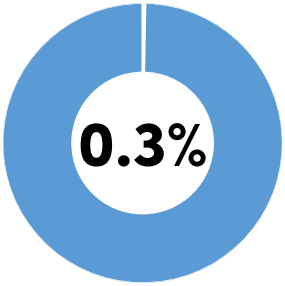


Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$18,400,000

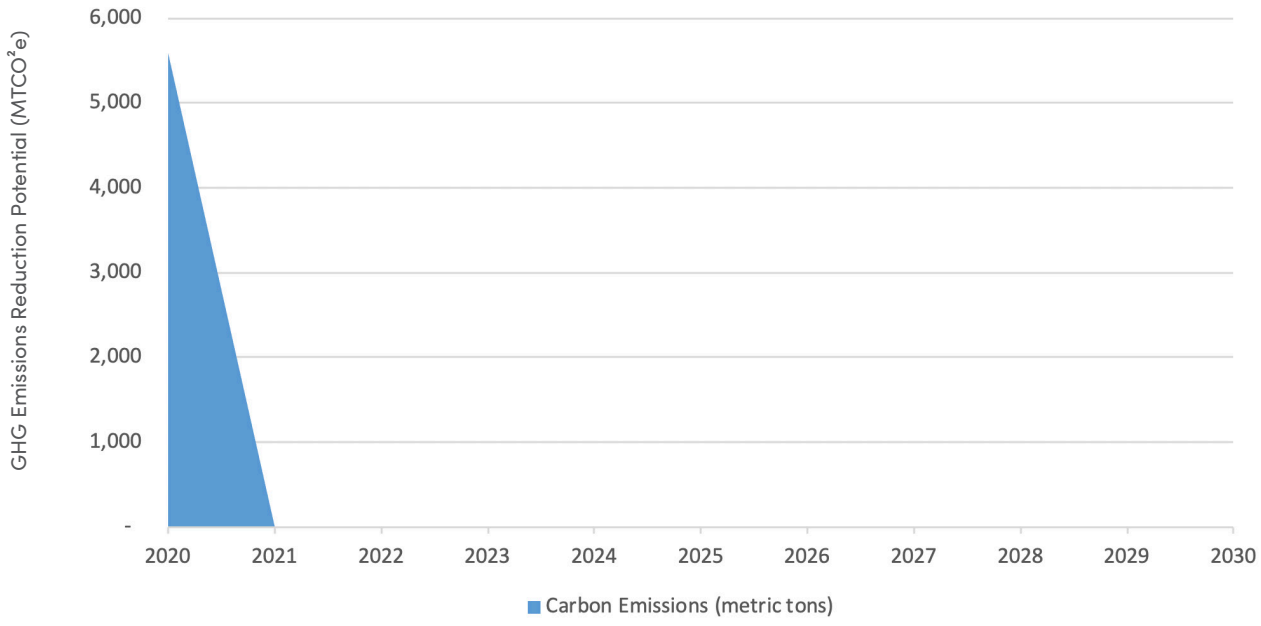
Greenhouse Gas Reduction Potential



5,600 metric tons carbon dioxide equivalent (.3% of community-wide emissions)

By 2021, the **Expand Commercial Recycling** strategy will have achieved all of its potential greenhouse gas emissions reductions.

EXPAND COMMERCIAL RECYCLING



3. REQUIRE SUSTAINABLE MATERIALS IN NEW AND EXISTING DEVELOPMENTS

This action involves the implementation of existing draft City plan for Construction and Demolition Waste to ensure 100% of debris is captured and repurposed. This includes expanding the plan to require sustainable designs in new building approval processes.

Vision for Requiring Sustainable Materials in New and Existing Developments

Ann Arbor has moved one step closer to a circular economy by removing 80% of construction and demolition waste from the landfill and supports it being repurposed for other constructive uses.

Party Responsible for Implementation

- Ann Arbor Department of Public Works, with support from Planning Department

Collaborators / Project Co-Designers

- Office of Sustainability and Innovations
- Resource Recycling Associates
- Construction community

Equity Impacts

No equity impacts explicitly identified.

Indicators of Success / Goals

Would consist of development of an ordinance to require construction and demolition projects to submit waste and diversion data as a component of their building permit or occupancy permit.

Target Demographic

Construction companies, developers, businesses, and community at large

Timeline and Initial Actions

2020

Review existing draft policy and revise, as necessary.

2021

Bring policy to Council for consideration. If passed, begin developing education and outreach materials immediately.

2022

Full scale implementation of policy.





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

$

Not calculated

Greenhouse Gas Reduction Potential



Not calculated

REQUIRE SUSTAINABLE MATERIALS IN NEW AND EXISTING DEVELOPMENTS



4. MOVE TOWARD A CIRCULAR ECONOMY

This action focuses on moving towards a circular economy, including actions to promote resource reduction, material reuse, and regeneration. By working with peer municipalities, we can create tools that allow for more transparency, traceability, and the calculation of embedded greenhouse gas emissions for different materials, goods, and services.

Vision Statement for Moving Toward a Circular Economy

The City of Ann Arbor will create a model of Circular Economy where goods and materials are recovered, reused, and recycled.

Party Responsible for Implementation

- Department of Public Works, with support from the Office of Sustainability and Innovations

Equity Impacts

Lower-income residents may benefit from being able to buy repurposed and refurbished items.

Collaborators / Project Co-Designers

- Peer Municipalities
- Repair Centers
- Tool Libraries /Lending Libraries
- Thrift Stores
- Curbside textile collection companies

Indicators of Success / Goals

• Repair centers for bicycles, appliances, etc. are promoted as first choice as opposed to replacement
• Support for toy, book and tool libraries to decrease the number of new purchases
• Support for thrift stores and reuse centers, along with having curbside textile collection to reduce the number of materials entering the landfill
• There is no City-coordinated textile collection program; curbside collection of textiles would be contracted for by the City with a private collector to provide weekly curbside collection from single family homes initially with potential future expansion to multi-family properties

Target Demographic

Ann Arbor residents and businesses

Timeline and Initial Actions

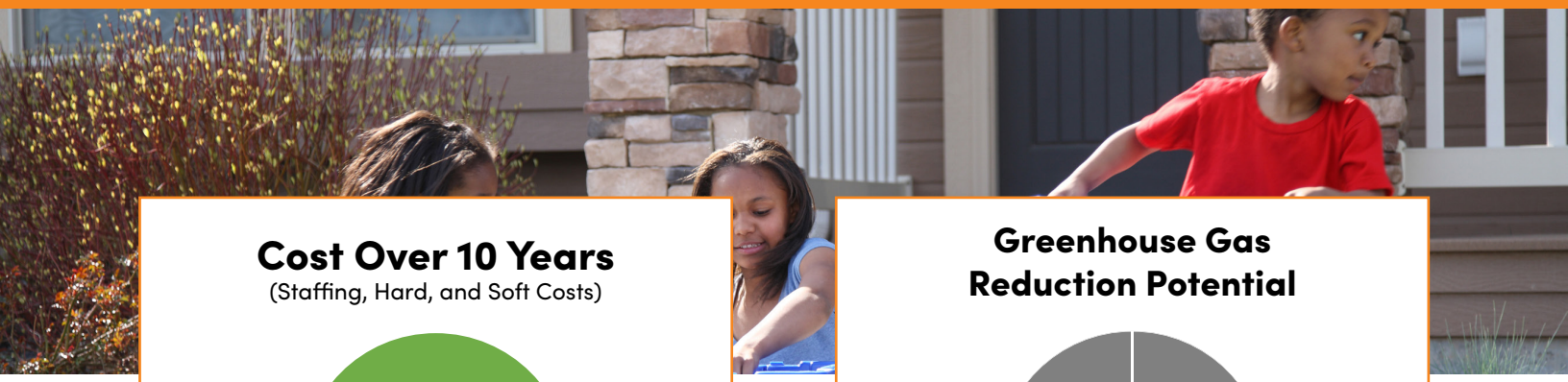
2020

Solid Waste Resource Management Plan gets adopted.

2022

Circular Economy strategy gets finalized and integrated into other planning initiatives.



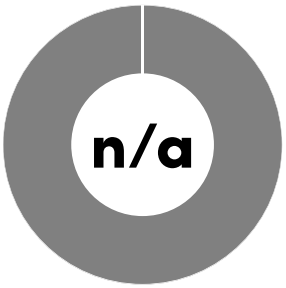


Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$

Not calculated

Greenhouse Gas Reduction Potential



Not calculated

MOVE TOWARD A CIRCULAR ECONOMY



5. SUPPORT A PLANT RICH DIET

Eating less meat and more fruits, vegetables, and grains is known to reduce one's environmental footprint and improve one's overall health. This action focuses on educating the community about the benefits of reducing meat consumption. Included in the action is the exploration of a greenhouse gas emissions footprint disclosure (like a calorie disclosure) on food sold at City facilities in order to educate people on the environmental footprint of their dietary choices.

Vision for Supporting a Plant Rich Diet

Ann Arborites are healthier, happier, and more sustainable by increasing the amount of fruits, vegetables, and grains they consume and lowering the amount of meat they consume.

Party Responsible for Implementation

- Office of Sustainability and Innovations, with support from Farmer's Market staff

Collaborators / Project Co-Designers

- Ann Arbor City Council
- Local farmers
- Washtenaw Optimal Wellness
- Department of Public Works
- Growing Hope
- Local grocery stores
- Local Chefs and restaurant owners
- Cultural centers

Equity Impacts

Food deserts exist in our region meaning residents do not have access to healthy and nutritious food. This action can help ensure that everyone in the City, especially our low-income residents, have access to healthy, nutritious options.

Indicators of Success / Goals

When asked, consumers indicate that they are better educated about the environmental impacts of their consumption choices and factor environmental impacts into their decision making.

Target Demographic

All Ann Arbor residents

Timeline and Initial Actions

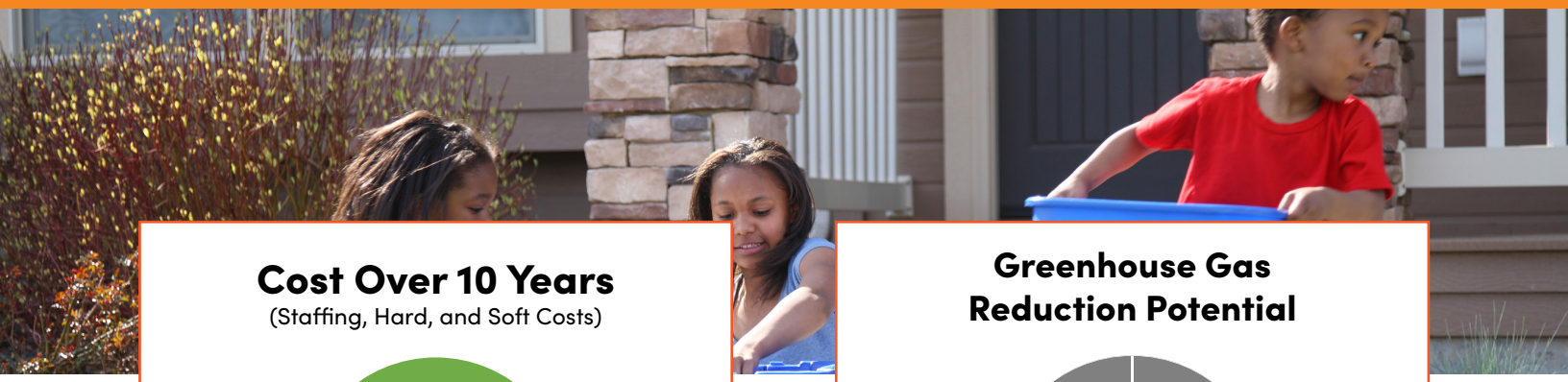
2021

Work with University of Michigan to understand environmental food labeling program; explore expanding to all City facilities where food is stored.

2022

Continue working with partner organizations to develop and disseminate materials about the benefits of a plant rich diet.



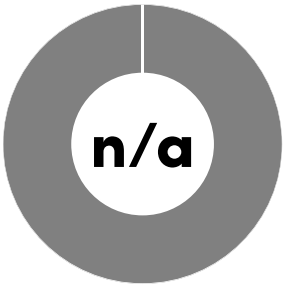


Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$

Not calculated

Greenhouse Gas Reduction Potential



Not calculated

SUPPORT A PLANT RICH DIET



6. ENHANCE REFRIGERANT RECYCLING AND REUSE PROGRAM

The use of refrigerants emits potent greenhouse gases, and removing them from use can have a significant impact on emissions reduction. This action focuses on enhancing refrigerant recycling programs and discouraged refrigerant use where possible.

Vision for Enchancing Refrigerant Recycling and Reuse Program

By banning refrigerants from disposal at City of Ann Arbor landfills we will drastically reduce greenhouse gas emissions from refrigerant emissions.

Party Responsible for Implementation

- Department of Public Works, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Local businesses
- City Communication Team

Equity Impacts

No equity impacts explicitly identified.

Indicators of Success / Goals

95% reduction in the amount of refrigerants disposed of at City facilities.

Assumptions

- Program focuses on education; explores penalties for violation

Target Demographic

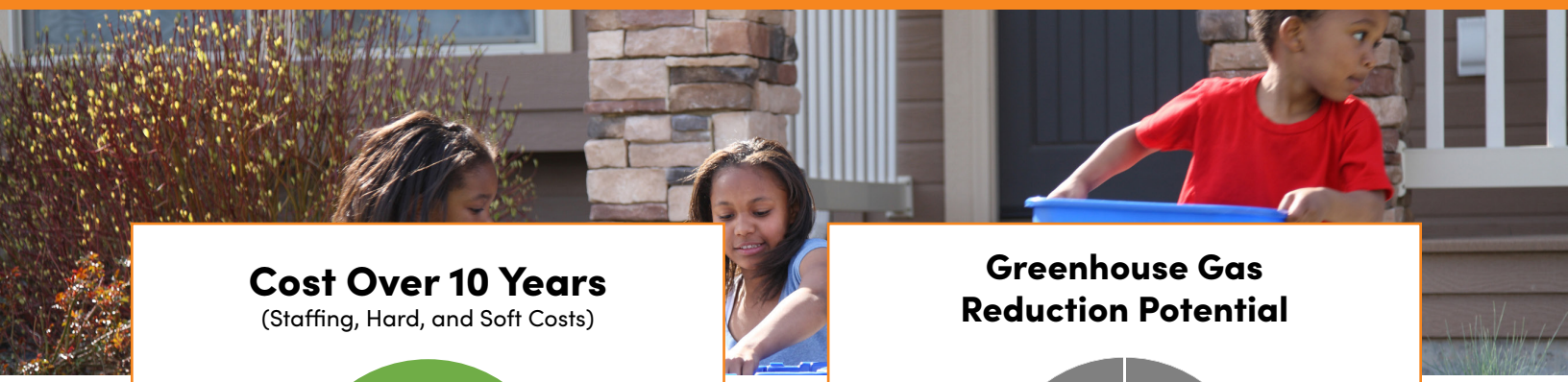
All Ann Arborites, especially renters, homeowners, and businesses

Timeline and Initial Actions

2021

Work with partners to launch an aggressive refrigerant education campaign; ensure systems are in place to properly recycle all refrigerants that are disposed of in the community.



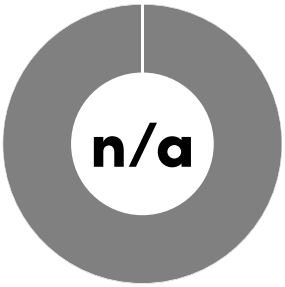


Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$

Not calculated

Greenhouse Gas Reduction Potential



Not calculated

ENHANCE REFRIGERANT RECYCLING AND REUSE PROGRAM





STRATEGY 6:

Enhance the Resilience of Our People and Our Place

This strategy focuses on enhancing the resilience of our people and our place. In particular, this strategy focuses on ensuring our community can not only survive, but thrive, regardless of what disruptions or changes may take place. To achieve this strategy, six actions were prioritized:

1. Invest in Resilience Hubs
2. Foster Neighborhood and Youth Ambassador Program
3. Preserve and Enhance the Local Tree Canopy
4. Conduct Asset and Needs Mapping of Neighborhoods
5. Assist in Assembling and Distributing Emergency Preparedness Kits
6. Implement Sensors to Monitor Heat, Air Quality, Waterways, and Flooding

While reducing greenhouse gas emissions were not the priority in selecting these actions, they do have a modest value to the community's carbon neutrality goals. In total, these actions contribute a 0.1% reduction in community-wide greenhouse gas emissions and cost around $7,500,000.

1. INVEST IN RESILIENCE HUBS

Resilience hubs are community-serving facilities augmented to support residents and coordinate resource distribution and services before, during, or after a natural hazard event. At their core, resilience hubs empower communities to take action around preparedness and increase community and neighborhood capacity. Resilience hubs operate at the nexus of climate mitigation, climate adaptation, and equity, and they strive to enhance community sustainability and resilience through a bottom-up approach centered on co-development and leadership.

Vision for Investing in Resilience Hubs

Ann Arbor's five resilience hubs are equitably enhancing community resilience while reducing greenhouse gas emissions. The hubs improve local quality of life for all of our residents, especially for our front line communities. Our robust network of resilience hubs empower residents to care for one another during a disaster for up to five days before government assistance resources may be needed. The hubs have reduced the poverty rate, increased local economic opportunities, reduced crime rates, and significantly increased people's satisfaction with their community.

Party Responsible for Implementation

- Office of Sustainability and Innovations, with support from Emergency Management

Collaborators / Project Co-Designers

- Residents
- Local businesses
- Community-based organizations
- The city's communications team
- Police department
- Fire department
- Finance and procurement
- Washtenaw County Department Of Community and Economic Development
- City planning team
- Washtenaw County Health Department
- Public Works
- Legal
- Transportation Manager
- Local community institutions
- Parks and Recreation
- Others as co-determined with

Equity Impacts

Many lower-income residents do not have access to a variety of resources in case of an emergency. Resilience hubs provide residents the ability to support one another in a crisis as well as to access community and City services day to day.

Indicators of Success / Goals

Every Ward within the City has a functioning, community-designed and -operated resilience hub that helps improve community sustainability, resilience, and social cohesion by 2030.

Target Demographic

The first few hubs will be placed in our underserved neighborhoods. Eventually, the goal is to have at least one resilience hub in each Ward and, ideally, a resilience hub in all of our front line communities/ neighborhoods

Assumptions

- External funding will be available to support the development of hubs
- External parties will be able and interested to operate the hub once developed
- The community is able to come to near consensus on what to include in their hub

Timeline and Initial Actions

2020

Continue working with community to explore resilience hub in southeastern Ann Arbor; continue seeking funding to support the hub.

2021

Initiate planning and community involvement for second hub; continue seeking funding for hubs and work on design with the community.

2022

Aim to launch first resilience hub.

2023+

Continue working with community to design, fundraise for, and launch hubs throughout the community.

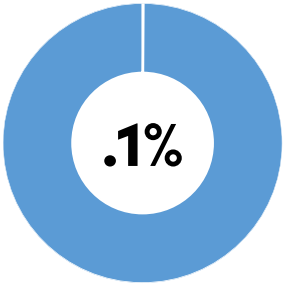




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$5,025,000

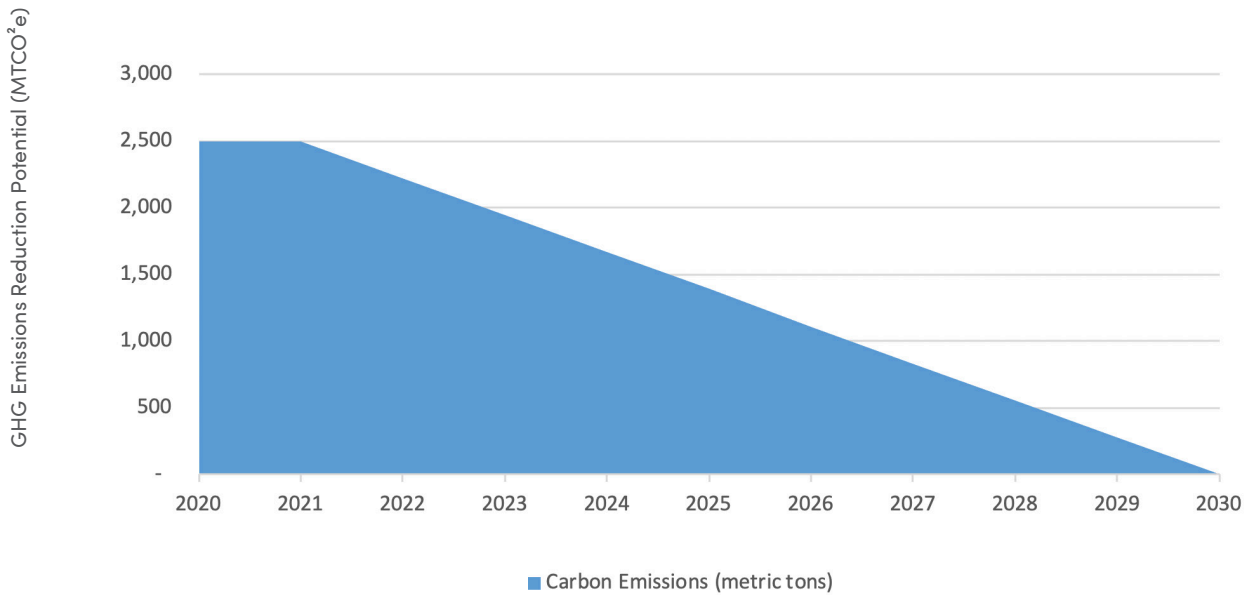
Greenhouse Gas Reduction Potential



2500 metric tons carbon dioxide equivalent (0.1%)

By 2030, the **Invest in Resilience Hubs** strategy will have achieved all of its potential greenhouse gas emissions reductions.

INVEST IN RESILIENCE HUBS



2. FOSTER NEIGHBORHOOD AND YOUTH AMBASSADOR PROGRAM

Achieving carbon neutrality will require mobilization of Ann Arborites on a nearly unprecedented scale. This action seeks to work with interested stakeholders to rapidly scale up and out our carbon neutrality work and the actions outlined in this Plan. In particular, this action calls for the creation of neighborhood as well as youth ambassadors. These individuals will be trained and given the tools and resources to work with their peers to implement many of the actions identified in this document.

Vision for Fostering Neighborhood and Youth Ambassador Programs

Through education and engagement, youth elevate their voices and take ownership of mitigation and adaption initiatives – helping to drive significant community-wide action. Neighborhood ambassadors lead a variety of projects related to energy and water consumption, waste reduction and recycling, transportation, and local food efforts. These actions foster community resource stewardship, climate action, and enhance local social cohesion.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Neighborhood associations
- A^2Zero youth representatives
- Ann Arbor Public Schools
- Community Action Network
- United Way
- Neutral Zone

Assumptions

- Individuals will want to serve as neighborhood or youth ambassadors
- All regions of the City will have someone volunteer to serve as an ambassador (or be recruited to serve) so that there aren't spatial gaps

Equity Impacts

OSI could partner with a nonprofit like United Way to train a cohort of adult residents who are living in affordable housing or who are low-income to be Climate Ambassadors. There could also be a youth cohort who are from underserved communities who could be trained as Youth Ambassadors. Participants in each of these groups would receive stipends. OSI could lead a group of other adults who would not need as much training in a similar program. These people would not get a stipend.

Indicators of Success / Goals

100 individuals are trained as youth or neighborhood ambassadors by 2025 and are actively working with their peers and neighbors to implement that A^2Zero strategy.

Target Demographic

All Ann Arborites interested in helping support the implementation of the A^2Zero Plan

Timeline and Initial Actions

2020

Design the neighborhood and youth ambassador program; work with interested stakeholders.

2021

Launch training and first tranche of ambassadors.

2022

Revise the ambassador program and scale throughout the City.





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

$

$350,000

Greenhouse Gas Reduction Potential



Not calculated

FOSTER NEIGHBORHOOD AND YOUTH AMBASSADOR PROGRAM



3. PRESERVE AND ENHANCE THE LOCAL TREE CANOPY

This action begins with conducting an analysis and creating a shared inventory of the local tree canopy as well as updating the master plan to incentivize shade tree and vegetation planting for private projects. This will increase the impact of shade trees as a natural cooling mechanism in urban areas. Tree type and placement are important considerations in advancing this action.

Vision for Preserving and Enhancing the Local Tree Canopy

A properly managed and diverse urban forest increases resiliency against invasive insects that carry diseases and impact the human population. By planting diverse tree species, the community benefits from increased shade and decreased heat island effects, while supporting biodiversity. Careful planning and management help the City mitigate and adapt to changing climate conditions.

Party Responsible for Implementation

- City Forrester/Public Works, with support from the Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Local nurseries
- Neighborhood associations
- Ambassadors

Equity Impacts

Studies have found that tree canopies in low-income communities and communities of color tend to be smaller. Ann Arbor's first Health Impact Assessment should be updated to ensure equitable enhancement of tree canopy in underserved neighborhoods is prioritized.

Indicators of Success / Goals

By 2030, 10,000 new trees are planted on city property and in the right of way and 10,000 new trees are planted on private property.

Assumptions

- City continues to plant 1,000 trees per year on City property and in the right of ways
- Community plants 1,000 trees per year on private property; These trees all survive
- Over the duration of this Plan, a single tree will absorb 48 pounds of carbon dioxide

Target Demographic

City facilities and private property owners

Timeline and Initial Actions

2020

City to continue annual tree planting.

2021

Launch neighborhood tree planting initiative.

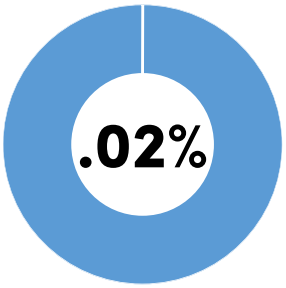




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$1,160,000

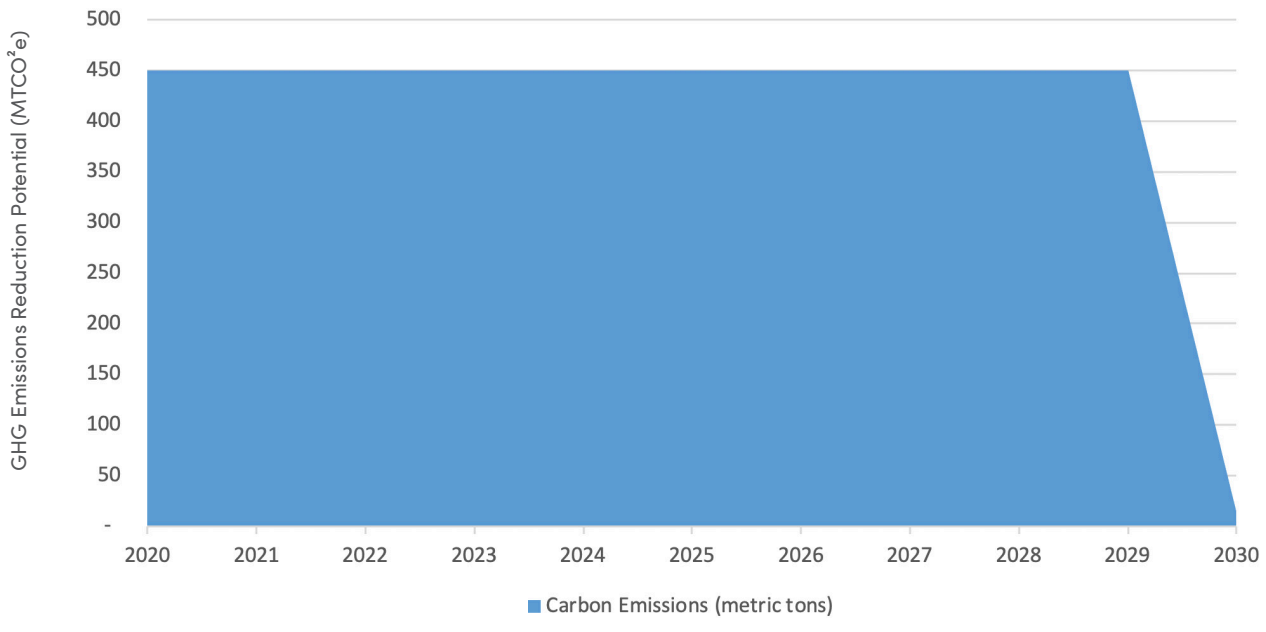
Greenhouse Gas Reduction Potential



450 metric tons of carbon dioxide equivalent (0.02% of community-wide emissions)

By 2030, the **Preserve and Enhance the Local Tree Canopy** strategy will have achieved all of its potential greenhouse gas emissions reductions.

PRESERVE AND ENHANCE THE LOCAL TREE CANOPY



4. CONDUCT ASSET AND NEEDS MAPPING OF NEIGHBORHOODS

This action involves working with neighborhoods to systematically identify what assets and needs exist in the area. Local assets are then leveraged to create a plan that prioritizes and addresses community needs.

Vision for Conducting Asset and Needs Mapping of Neighborhoods

Community mapping leads to the identification of safe gathering points in neighborhoods when events such as natural disasters and power outages occur. Physical spaces, such as homes, are activated as shelters during necessary times.

Party Responsible for Implementation

- Office of Sustainability and Innovations, with support from Emergency Management

Collaborators / Project Co-Designers

- Red Cross
- Neighborhood Associations
- Meals on Wheels
- Neighborhood Ambassadors
- Youth Ambassadors
- Ann Arbor Public Schools

Equity Impacts

Many residents do not have financial security when faced with crisis situations. By identifying assets in advance, community mapping will help residents better rely on each other in crisis situations.

Indicators of Success / Goals

By 2025, every neighborhood in Ann Arbor has an asset map and knows how to activate it in the case of an emergency.

Assumptions

- Enough individuals volunteer to help with the exercise to ensure the entire community is covered
- Capacity exists to update and maintain the asset map

Target Demographic

All Ann Arborites

Timeline and Initial Actions

2020

Develop asset mapping exercise; convene neighborhood associations and those interested in neighborhood ambassador program to get feedback on mapping.

2021

Launch neighborhood asset mapping exercise; create methodology to update and maintain asset map.

2022

Work with volunteers to ensure all neighborhoods have a preliminary asset map at least.





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

$

$300,000

Greenhouse Gas Reduction Potential



Not calculated

CONDUCT ASSET AND NEEDS MAPPING OF NEIGHBORHOODS



5. ASSIST IN ASSEMBLING AND DISTRIBUTING EMERGENCY PREPAREDNESS KITS

This action involves working directly with partners and community organizations to educate Ann Arborites on emergency preparedness and prepare emergency preparedness kits and plans that residents can keep to ensure they are safe during an emergency.

Vision for Assembling and Distributing Emergency Preparedness Kits

Residents have the resources they need to care for themselves and their families for multiple days during a disaster situation.

Party Responsible for Implementation

- Office of Sustainability and Innovations, with support from Emergency Management

Collaborators / Project Co-Designers

- Red Cross
- Neighborhood Associations
- Meals on Wheels
- Neighborhood Ambassadors
- Youth Ambassadors
- Ann Arbor Public Schools

Equity Impacts

Many residents, whether due to cost, language, or other barriers may not the resources to build emergency preparedness kits for their families on their own. Working as a group will help all residents be better prepared for emergencies.

Indicators of Success / Goals

1000 residents have emergency preparedness kits by 2030 thanks to support from this action.

Assumptions

- AAPS partners with the City on hosting emergency preparedness events
- Some supplies are donated by local businesses

Target Demographic

All Ann Arbor residents with a priority given to low-income residents

Timeline and Initial Actions

2020

Work with Emergency Management to create a list of essential emergency supplies and a template emergency plan.

2021

Work with schools to launch emergency preparedness sessions with students and caregivers throughout the community.

2022

Integrate emergency preparedness module into the Neighborhood and Youth Ambassador programs.

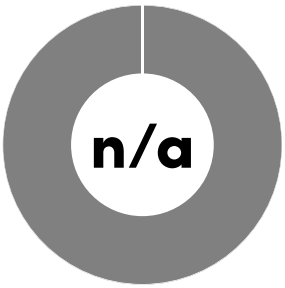




Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$350,000

Greenhouse Gas Reduction Potential



Not calculated

ASSIST IN ASSEMBLING AND DISTRIBUTING EMERGENCY PREPAREDNESS KITS



6. IMPLEMENT SENSORS TO MONITOR HEAT, AIR QUALITY, WATERWAYS, AND FLOODING

This action focuses on collecting data and using sensors to proactively understand risks and mitigate vulnerabilities. Includes the usage of drones and sensors to collect data and to respond to events, when necessary.

Vision for Implementing Sensors to Monitor Heat, Air Quality, Waterways, and Flooding

Ann Arbor's ubiquitous system of sensors and monitors allows the City to proactively manage threats and risks, while ensuring that Ann Arborites enjoy an exceptional quality of life. Monitors and sensors throughout the City provide real-time data that helps protect the public health, safety, and general welfare.

Party Responsible for Implementation

- Ann Arbor Information Technology Unit

Equity Impacts

Few equity impacts.

Collaborators / Project Co-Designers

- Stormwater, wastewater, and water system
- Office of Sustainability and Innovations
- Emergency Management
- University of Michigan
- Huron River Watershed Council
- Downtown Development

Indicators of Success / Goals

Ann Arbor's landscape of sensors and monitors provides real-time information that has been utilized to protect the public from acute and chronic disruptions.

Assumptions

- Any technology adopted can tie into the City's existing IT infrastructure
- The various technologies used can inter-operate

Target Demographic

This action mostly impacts local government staff and regional decision-makers/planners

Timeline and Initial Actions

2020

Finish Smart City Strategy; include needs for monitoring.

2021

Pilot sensors throughout the City with UM and other partners.

2024

Install sensors and monitors throughout the City as an interconnected network.



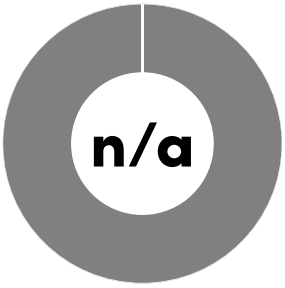


Cost Over 10 Years
(Staffing, Hard, and Soft Costs)

$

$300,000

Greenhouse Gas Reduction Potential



Not calculated

IMPLEMENT SENSORS TO MONITOR HEAT, AIR QUALITY, WATERWAYS, AND FLOODING





OTHER STRATEGIES:

This strategy covers the remaining programs and activities that don't fit into other areas. It also includes greenhouse gas emissions offsets to close out any lingering gaps in achieving community-wide carbon neutrality. To achieve this strategy, four specific actions have been identified:

1. Advance Equity Programs
2. Promote Sustaining Ann Arbor Together Grant Program
3. Establish Internal Carbon Price
4. Offset Greenhouse Gas Emissions

Combined, these four actions equate to just under 14% of community-wide emissions reductions and are estimated to cost just under $6,000,000.

1. ADVANCE EQUITY PROGRAMS

The Office of Sustainability and Innovations (OSI) is committed to ensuring climate protection and mitigation work improves the lives of Ann Arbor residents who have been historically underrepresented and under-resourced. Our Equity Program works to ensure that equity is embedded in all of the work we do – from the programs we advance, to the stakeholders we engage with, to the advisors we seek.

Vision for Advancing Equity Programs

By 2028, all of OSI's programs have an equity focus, OSI staff reflect the diversity of Ann Arbor and Washtenaw County, and staff have developed strong working relationships with members of local low-income communities and communities of color.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Washtenaw County's Racial Equity Program Manager
- Dr. Tony Reames
- Urban Sustainability Directors Network
- City Administrator
- All City Service Areas
- OSI's Equity Fellow
- City of Ann Arbor's Diversity, Equity and Inclusion Manager

Equity Impacts

OSI will continue to center equity in their work, and will expand their decision-making and implementation to authentically include marginalized communities who are most at risk due to climate change.

Indicators of Success / Goals

By 2028, all of OSI's programs have an equity focus.

Assumptions

- Resources will continue to exist to support racial equity training for staff

Target Demographic

Ann Arbor City employees and staff of allied organizations, Ann Arbor residents of color, and low-income Ann Arbor residents and workers

Timeline and Initial Actions

2020

OSI staff will receive and lead continuing education about equity issues (ongoing); hire equity fellow to help with aging in place efficiently work

2021

OSI staff will conduct baseline equity trainings with the Energy and Environmental Commissioners; hire summer equity fellow

2023

OSI Equity Advisory Commission formed





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

$

$200,000

Greenhouse Gas Reduction Potential



Not calculated

ADVANCE EQUITY PROGRAMS



2. PROMOTE SUSTAINING ANN ARBOR TOGETHER GRANT PROGRAM

This program provides small grants to residents, schools, local nonprofits, and local businesses to advance sustainability-related activities in Ann Arbor's right of way.

Vision for Promoting Sustaining Ann Arbor Together Grant Program

Through the Sustaining Ann Arbor Together grant program, Ann Arborites are able to unlock financial capital to implement solutions that are making our community a healthier, more sustainable place to live.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Nonprofit organizations serving Ann Arbor residents
- Neighborhood associations
- University of Michigan
- Ann Arbor Public Schools

Equity Impacts

These resources can help undeserved areas of the community unlock capital to address their specific sustainability concerns and opportunities.

Indicators of Success / Goals

At least 10 grants are awarded, per year, through the Sustaining Ann Arbor Together grant program.

Assumptions

- $100,000 will continue to be available, annually, for the program
- The program will be fully subscribed

Target Demographic

Ann Arbor residents

Timeline and Initial Actions

2020

OSI staff continue to administer the program, conducting outreach regularly to let people know about the opportunity.





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

$1,000,000

Greenhouse Gas Reduction Potential

n/a

Not calculated

PROMOTE SUSTAINING ANN ARBOR TOGETHER GRANT PROGRAM



3. ESTABLISH INTERNAL CARBON PRICE

This action creates a financial mechanism whereby all City Service Areas holistically integrate greenhouse gas emissions and their impacts into decision-making. This will happen through the use of an internal carbon tax (e.g., payment by each service area for each ton of greenhouse gases emitted). These resources will then be given back in the form of energy efficiency improvements and renewable energy installations at City facilities.

Vision for Establishing Internal Carbon Price

Citywide greenhouse gas emissions are carbon neutral thanks in part to our internal carbon tax that encourages Service Areas to reduce emissions while providing funding support through the fee collected to finance energy efficiency and renewable energy improvements.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Equity Impacts

No explicit equity impacts were identified.

Collaborators / Project Co-Designers

- Finance
- Information Technology
- DTE Energy
- City Administrator
- Consumers Energy
- Fleet and Facilities

Indicators of Success / Goals

All City operations are powered with 100% clean and renewable energy by the year 2030.

Assumptions

- Funding generated by enterprise funds will remain available for use only by the enterprise funds
- Any funds generated will be applied to energy efficiency work and/or renewable energy activities that reduce the overall greenhouse gas emissions of the unit
- Price will not grow to more than the social cost of carbon

Target Demographic

All City Service Areas

Timeline and Initial Actions

2020

OSI staff create internal carbon tax work plan and work with finance to pilot a $5/ton charge

2021

OSI work to increase fleet rates and administer a $10/ton charge

2022

Review program and suggest any needed revisions





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

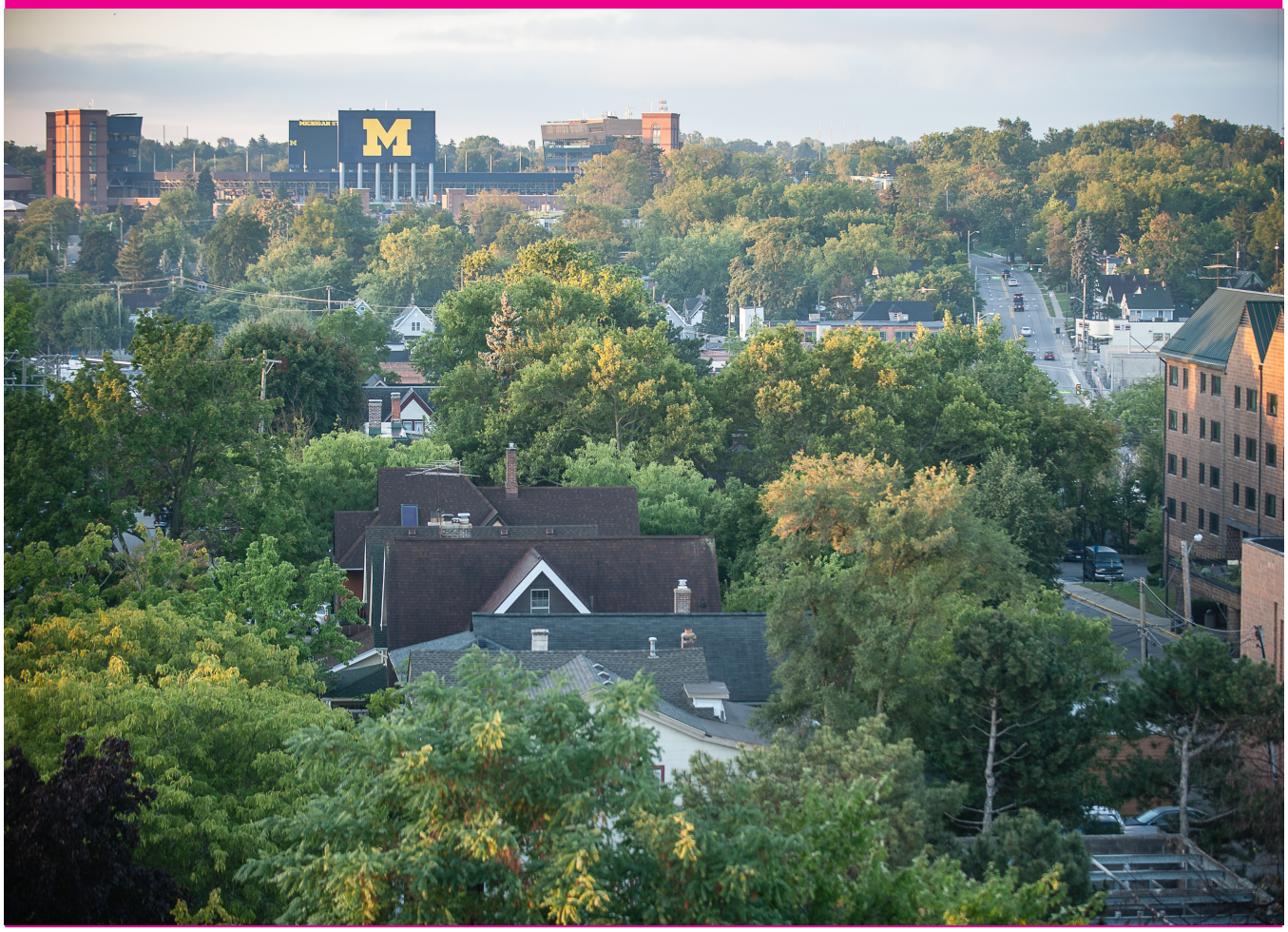
$75,000

Greenhouse Gas Reduction Potential

n/a

Not calculated

ESTABLISH INTERNAL CARBON PRICE



4. OFFSET GREENHOUSE GAS EMISSIONS

Our community has a lot of work to completely eliminate our greenhouse gas emission by 2030. For the activities that we cannot currently reduce emissions from, due to a lack of technical or financially feasible solutions, we can purchase carbon offsets to reduce greenhouse gas emissions outside of our community. Because greenhouse gases act the same way in the Earth's atmosphere, regardless of where they are produced, our community can purchase and retire renewable energy credits replacing fossil fuels to offset our own emissions as we work towards our target.

Vision for Offsetting Greenhouse Gas Emissions

Offsets are only used to close the greenhouse gas emissions gap between what we are able to do locally and what needs to be offset to achieve our goal of carbon neutrality by 2030.

Party Responsible for Implementation

- Office of Sustainability and Innovations

Collaborators / Project Co-Designers

- Energy Commission
- Environmental Commission
- University of Michigan

Equity Impacts

While local offsets may or may not be feasible, the City will aim to invest our carbon offset funds into programs that will decrease income and/or racial justice inequities. This includes looking at potentially making investments in the global south which has been disproportionately burdened by extractive economies.

Indicators of Success / Goals

The amount of greenhouse gas emission offsets purchased decline over time as the City undertakes more local actions.

Assumptions

- All offsets are additional, meaning that they wouldn't have happened without our investment
- Reduces demand for fossil fuels and other greenhouse gas emissions sources
- Preference given to investing in projects that take place in low-income and front line communities
- Any renewable energy credits generated will be retired
- Includes investigating options for a local carbon offset program

Target Demographic

Entire community

Timeline and Initial Actions

2020

Provide recommendations on characteristics of offsets and get Council's agreement

2021

Solidify the source for purchasing greenhouse gas emissions offsets

2028

Undertake first greenhouse gas emissions offset purchase and continue as needed.





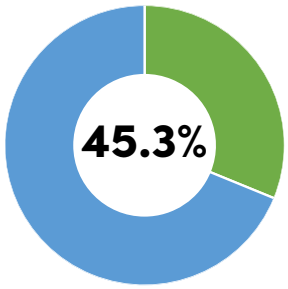
Cost Over 10 Years

(Staffing, Hard, and Soft Costs)

$9,440,000

– this assumes two years of purchasing offsets and the staffing support to set-up the purchase.

Greenhouse Gas Reduction Potential

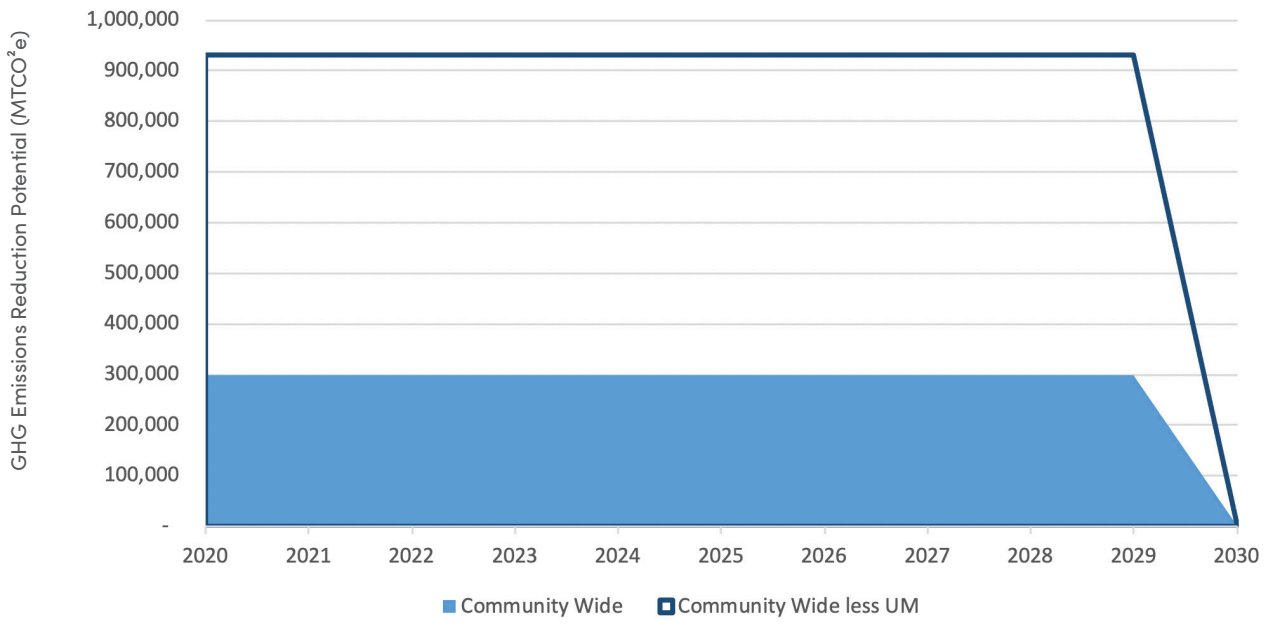


992,000 metric tons carbon dioxide equivalent (45.3% of community wide emissions).

By 2030, the **Offset Greenhouse Gas Emissions** strategy will have achieved all of its potential greenhouse gas emissions reductions.

The figure below shows the estimated total amount of offsets (in light blue) that will need to be purchased assuming the community and University participate in all actions of the Plan outlined above. The dark blue outline shows the amount of offsets that will need to be purchased if the University does not participate in any of the actions outlined.

OFFSET GREENHOUSE GAS EMISSIONS



CLOSING

The A²Zero Plan is a holistic living Plan. It will change. It will evolve. It will get better as the community comes together to implement these and other actions. It is also the beginning of the journey that many other Michigan municipalities will follow in their own efforts to achieve carbon neutrality. With no blueprint for us to follow, A²Zero is our effort to reimagine Ann Arbor in a manner that's equitable, sustainable, and transformative for all Ann Arborites while ensuring we create a more resilient community.

Grounded in equity, the Plan works to ensure the most vulnerable in Ann Arbor can thrive as we bounce forward from any shock or stressors the future may hold. The Plan recommends investing in land use strategies that allow for denser and mixed use neighborhoods to both close the wealth gap by providing more affordable housing so those who work here can also live here ,and by providing more accoutrements within walking and biking distance to our homes. A²Zero encourages more residents and visitors to use an expanded, energy efficient multimodal transportation network to move about our community. It encourages investment in local renewable energy and in our connection to each other and our place.

A²Zero also gives respite to those seniors who desire to age in the places they are most familiar with by ensuring they have access to weatherization programs that lower their energy costs, by launching aging in place programs, and by fostering greater neighborhood social networks.

A²Zero builds upon the significant recent science indicating that society needs to move as rapidly as possible to achieve significant reductions in greenhouse gas emissions in order to avoid the most catastrophic impacts associated with climate change. That is why staff within the Office of Sustainability and Innovations created this Plan as a foundation for achieving community-wide carbon neutrality by 2030.

Time is of the essence, and action is desperately needed. Some of the programs in this Plan will be wildly successful. Others will be moderately successful. And yet others will prove inadequate for the challenge ahead. Our job is not to be beholden to what is written in the pages of this document, but to move intentionally, aggressively, and wholeheartedly towards a significant reduction in local greenhouse gas emissions.

Ann Arbor has the intellect, the human power, the resources, and the skills needed to move climate action and sustainability forward. What is currently missing is the will, and what is lacking is time. Join us as we combat the most significant crisis of our era. Together we can avoid the unmanageable, manage the unavoidable, and create a more equitable and just society for all.



APPENDIX 1 – LIST OF PUBLIC EVENTS

1. November 13, 2019 – Public launch of the A²Zero initiative at Cobblestone Farm. Over 250 individuals attended.
2. November 18, 2019 – Washtenaw International High School sustainability talk to 60 High School students.
3. November 19, 2019 – met with leader of Old Fourth Ward Neighborhood Association to discuss A²Zero.
4. November 20, 2019 – Lunch and Learn with City Staff on A²Zero.
5. November 21, 2019 – Climate Reality Presentation at Vertex Coffee.
6. November 26, 2019 – Ypsilanti Sustainability Committee Climate Reality Presentation at Park Ridge Community Center.
7. December 3, 2019 – Power Hour at Westgate Library discussing energy efficiency and solar power.
8. December 4, 2019 - Meeting to discuss how we can disseminate the word about A²Zero and launch a neighborhood climate ambassadors program.
9. December 4, 2019 - Commercial Power Hour in partnership with the 2030 District & large scale commercial building owners.
10. December 10, 2019 – Cohosted event at Forest Hills Cooperative to begin teaching recycling and composting to over 15 residents and children. Including an introduction to A²Zero.
11. December 11, 2019 – Met with Extinction Rebellion to explain and gather feedback about A²Zero.
12. December 15, 2019 – Tabled at Homegrown at The Cobblestone Art Show to share information about A²Zero.
13. December 18, 2019 – Convened 12 High School and 1 middle school student to glean their thoughts on how they would like to assist in A²Zero at their schools.
14. December 19, 2019 – Tabled about A²Zero at the Ann Arbor Hands on Museum.
15. December 20, 2019 – Climate Reality Presentation at Wheeler Service Center to 140 staff; included an introduction to A²Zero.
16. January 6, 2020 – A²Zero Meeting with Fire Department Management.
17. January 6th, 2020 – A²Zero meeting with Safety unit.
18. January 8, 2020 – Tabled at Veterans Memorial Park during High School Hockey game.
19. January 11, 2020 - A²Zero discussion with Washtenaw 350.
20. January 13, 2020 – Discussed A²Zero and opportunities for resident engagement with property manager of Arrowwood Hills.
21. January 14, 2020 – A²Zero presentation and discussion with the Energy Commission.
22. January 14, 2020 – A²Zero discussion with Clerks Office.
23. January 15, 2020 – Presentation and discussion on A²Zero to the Washtenaw Food Policy Council.
24. January 15, 2020 – A²Zero presentation at the Ann Arbor Housing Commission meeting.
25. January 17, 2020 – Youth and A²Zero discussion with local youth leaders.
26. January 17, 2020 – A²Zero and the Transportation, Energy, Environmental, and Planning Commissions.
27. January 21, 2020 – A²Zero discussion at the Slow Food Huron Valley member meeting.

28. January 21, 2020 – A²Zero presentation and discussion with the Huron Valley Sierra Club members.
29. January 21, 2020 – A²Zero meeting with Forest Hills Cooperative.
30. January 23, 2020 – Arrowwood Youth Conversation.
31. January 23, 2020 – A²Zero discussion with the Attorney's Office.
32. January 26, 2020 – A²Zero presentation and discussion with Citizens Climate Lobby members.
33. January 28, 2020 – A²Zero discussion with Ann Arbor's IT Department.
34. January 29, 2020 – A²Zero presentation to the Ann Arbor School Board.
35. January 30, 2020 – A²Zero Lunch and Learn United Way of Washtenaw County.
36. January 30, 2020 – Sustainability Forum in A²Zero and the Energy Sector.
37. January 30, 2020 – A²Zero presentation and discussion with neighbors in Pittsfield Village.
38. February 6, 2020 – A²Zero presentation and discussion with Main Street Association members.
39. February 8, 2020 – A²Zero tabling at the Ann Arbor Farmers Market.
40. February 12, 2020 – A²Zero presentation at Michigan Municipal League event.
41. February 13, 2020 – Sustainability Forum on A²Zero and Mobility.
42. February 13, 2020 – Shared details about A²Zero at Michigan Environmental Justice Summit.
43. February 15, 2020 – A²Zero presentation and discussion with Ann Arbor Indivisible.
44. February 18, 2020 – A²Zero materials shared at The Polar Vortex Climate Change and Weird Weather event.
45. February 19, 2020 – Bryant Community Center, A²Zero, & A2 Housing Commission Outreach.
46. February 19, 2020 – A²Zero presentation and discussion with the Transportation Commission.
47. February 19, 2020 – A²Zero and Climate Night Trivia.
48. February 20, 2020 – Presentation to Zingerman's Community of Businesses on A²Zero.
49. February 20, 2020 – Presentation on A²Zero to the Washtenaw Area Apartment Association.
50. February 20, 2020 – Presentation to the Ann Arbor Street Design Team on A²Zero.
51. February 22, 2020 – Dive-In Movie (Moana) and Climate Brainstorming.
52. February 22, 2020 – 2nd Carbon Neutrality Town Hall.
53. February 22, 2020 – Washtenaw 350 Environmental Justice Dialogues, including sharing details about A²Zero.
54. February 24, 2020 – A²Zero presentation and discussion with Finance Department.
55. February 26, 2020 – 21 Day Equity Challenge Summit and opportunity to share about A²Zero.
56. February 26, 2020 – A²Zero discussion at the Ann Arbor Climate Partnership meeting.
57. February 27, 2020 – A²Zero discussion with Environmental Commission.
58. February 27, 2020 – Climate change and the Great Lakes presentation and discussion about A²Zero.
59. February 27, 2020 – A²Zero forum with local and regional solar installers.
60. February 29, 2020 – A²Zero tabling at the Ann Arbor Farmers Market.

61. March 2, 2020 – A²Zero and Sustainability presentation to Washtenaw International High School.
62. March 4, 2020 – Climate Leadership Conference– Presentation on A²Zero.
63. March 6, 2020 – Presentation at the New Strategies for Resilient Local Economies about A²Zero.
64. March 9, 2020 – ²Zero presentation at the Local Food Summit.
65. March 9, 2020 – A²Zero presentation at Symposium on Societal Engagement in Climate and Space Sciences.
66. March 9, 2020 – A²Zero presentation to Old West Side Neighborhood Association Board of Directors.
67. March 18, 2020 – A²Zero discussion with Transportation Commission.
68. March 19, 2020 – Sustainability, A²Zero and Local Climate Action at Ford School.
69. March 26, 2020 – A²Zero discussion with Environmental Commission.

Postponed or Delayed Events

1. TBD: Neutral Zone Environmental Justice Forum with A²Zero (rescheduled due to weather).
2. March 11, 2020 – Climate Action Teach-In at University (Cancelled due to Coronavirus Pandemic).
3. March 11, 2020 – A²Zero and Student Engagement presentation (Cancelled due to Coronavirus Pandemic).
4. March 12, 2020 – Michigan Climate Action Summit and Panel on A²Zero and local climate action (Cancelled due to Coronavirus Pandemic).
5. March 12, 2020 – Wege Lecture on Sustainability (Cancelled due to Coronavirus Pandemic)
6. March 12, 2020 – Rise Up for the Earth – Community Earth Day Celebration brief introduction to A²Zero (Cancelled due to Coronavirus Pandemic).
7. March 14, 2020 – Finding the Middle Ground and American Climate presentation (Cancelled due to Coronavirus Pandemic).
8. March 14, 2020 – Climate Strategies: What actions will keep us at 1.5-2oC presentation (Cancelled due to Coronavirus Pandemic).
9. March 14, 2020 – Climate Change and the Great Lakes (Cancelled due to the Coronavirus Pandemic).
10. March 19, 2020 – Sustainability Forum on Carbon Neutrality in the Resource Sector at Downtown Library (Postponed due to Coronavirus Pandemic).
11. March 22, 2020 – Solar Faithful Workshop and discussion on A²Zero (Cancelled due to the Coronavirus Pandemic).

APPENDIX 2 – LIST OF TECHNICAL ADVISORY COMMITTEE MEETINGS

1. November 13, 2019 – Hosted four technical advisory committee meetings simultaneously to launch this element of our work. The four technical advisory committees were: 1) mobility; 2) energy; 3) resource reduction; and 4) adaptation and resilience.
2. December 16, 2019 – Adaptation and Resilience TAC meeting.
3. December 17, 2019 – Resource Reduction TAC meeting.
4. December 17, 2019 – Energy TAC meeting.
5. December 19, 2019 – Mobility TAC meeting.
6. January 9, 2020 – Adaptation and Resilience TAC meeting.
7. January 16, 2020 – Energy TAC meeting.
8. January 22, 2020 – Resource Reduction TAC meeting.
9. January 23, 2020 – Mobility TAC meeting.
10. January 27, 2020 – Adaptation and Resilience TAC meeting.
11. January 31, 2020 – Mobility TAC meeting.
12. February 6, 2020 – Resource Reduction TAC meeting.
13. February 11, 2020 – Adaptation and Resilience TAC.
14. February 21, 2020 – TAC celebration breakfast.

APPENDIX 3 – LIST OF A²ZERO PARTNER EVENTS

1. December 13, 2019 – Hosted first meeting of the A²Zero partners.
2. December 19, 2019 – Hosted equity and climate training for A²Zero partners.
3. March 20, 2020 – A²Zero partners only unveiling of the final strategy.

APPENDIX 4 – COUNCIL RESOLUTION IN SUPPORT OF CREATING A PLAN TO ACHIEVE ANN ARBOR COMMUNITY-WIDE CLIMATE NEUTRALITY BY 2030

..Title

Resolution in Support of Creating a Plan to Achieve Ann Arbor Community-Wide Climate Neutrality by 2030

..Body

Whereas, By adopting the Climate Action Plan (CAP) in 2012, the Ann Arbor City Council ("City Council") committed to an ambitious, multi-strategy vision to address climate change by reducing community-wide greenhouse emissions (8% by 2015, 25% by 2025, and 90% by 2050 relative to year 2000 baseline carbon dioxide equivalent (CO_2e) emissions levels);

Whereas, The Environmental Commission and many community and student groups have advocated for Ann Arbor's declaration of a climate emergency;

Whereas, The Office of Sustainability and Innovations ("OSI") was created in FY19 in order to actualize the goals created and reaffirmed by City Council;

Whereas, The Office of Sustainability and Innovations has created a 5-year work plan that will help the City achieve a 25% reduction in community-wide greenhouse gas emissions by the year 2025, based on 2000 levels;

Whereas, Despite the City's goals and progress to-date, the global climate is changing at a rate that necessitates bolder action to reduce greenhouse gas emissions, including getting to net zero emissions as soon as possible;

Whereas, Over 19,000 scientists have signed a Second Warning to Humanity proclaiming that "a great change in our stewardship of the Earth and the life on it is required, if vast human misery is to be avoided",

Whereas, City Council realizes that climate change has direct and pressing impacts on all aspects of public health, safety, and general welfare;

Whereas, Great community interest exists to support the efforts to achieve community-wide carbon neutrality in a just and equitable manner;

Whereas, The University of Michigan has convened The President's Commission on Carbon Neutrality (PCCN), which commission includes Ann Arbor staff, for the purpose of working together with community and regional partners toward shared carbon neutrality goals;

Whereas, Creating a climate neutrality plan is necessary to identify, plan for, budget, and work towards implementing the actions required to achieve community-wide carbon neutrality; and

Whereas, Funding for public engagement is available in the FY2020 Office of Sustainability and Innovations budget;

RESOLVED, That the Ann Arbor City Council declares a climate emergency and commits to take action as a result of that declaration;

RESOLVED, The Ann Arbor City Council supports a public engagement process, beginning immediately, that helps outline how the entire Ann Arbor Community could achieve carbon neutrality by the year 2030, a target date that is both ambitious and achievable;

RESOLVED, City Council requests that the City Administration develop a draft plan for how the Ann Arbor community could achieve carbon neutrality ("2030 Carbon Neutral Ann Arbor Plan") to be presented to Council not later than March 31, 2020 to support its presentation on Earth Day 2020;

RESOLVED, City Council directs the City Administrator to 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;

RESOLVED, City Council direct the City Administrator to seek and facilitate collaboration with the University of Michigan and the PCCN to create and realize the 2030 Carbon Neutral Ann Arbor Plan; and

RESOLVED, City Council request the City Administrator to consider the likely outcomes of the in-development 2030 Carbon Neutral Ann Arbor Plan as he develops the FY21 Budget Planning process and, ultimately, the FY21 Budget.

Sponsored by: Mayor Taylor, Councilmembers Bannister, Smith, Ramlawi, Grand, Ackerman, Eaton, Nelson and Griswold

As Amended and Approved by Ann Arbor City Council on November 4, 2019

APPENDIX 5: LIST OF IDEAS CONSIDERED FOR A²ZERO

Through the A²Zero process, we received input from a diverse group of stakeholders, including technical experts, partner organizations, residents, and the general public interested in providing feedback to the A²Zero Initiative. Ideas were generated at public events, like the first A²Zero Town Hall, through multiple public surveys, and from four technical advisory committees. The Plan presented above includes the ideas evaluated to be the most impactful to reducing our community-wide emissions, fairly improving our community's quality of life, and the most feasible to implement. The list of ideas below serves to document the full list of ideas received, and to be turned to should adjustments to the Plan be required. Many of the ideas listed below would enhance our community, and is a testament to our community's dedication, creativity, and hopes and dreams.

TOPIC: ENERGY

Energy Production

- Regional methane digester
- Solar energy on greenbelt
- County/city energy efficiency and renewable energy concierge service
- Create microgrids
- Create community solar on non-city property, university of Michigan, municipal property, or Ann Arbor Public Schools
- Bulk-buy purchasing opportunities for renewable energy, energy efficiency, and electric vehicles and infrastructure
- Target high-energy "districts" with renewables, energy efficiency, electrification: residential, commercial
- Change solar incentives
- Create volunteer solar opportunities

Energy Efficiency

- New building requirements: energy efficiency, renewables
- Net zero affordable housing
- Reduce property taxes based on energy efficiency upgrades to buildings
- Develop carbon neutral districts: zero energy zones, 2030 districts
- DTE Energy on-bill financing for energy efficiency improvements
- Geothermal districts
- Require green/white roofs
- Energy disclosure policies: rental/single family/commercial

Electrification

- Require all existing appliances and HVAC systems be electrified
- Increase grid capacity for electrification

Financing

- Create financing opportunities/loan loss reserve
- Create carbon tax
- Create on-bill financing for renewable energy and energy efficiency projects

Sequestration

- Increase carbon sequestration practices in Ann Arbor

Offsets

- Offset programs

Education, Outreach, and Marketing

- Youth education on carbon neutrality
- Create information sessions on energy efficiency, electrification, renewables, and electric vehicles for different sectors

- Spread information about DTE Energy's existing energy efficiency programs
- Increase awareness of existing programs
- Change zoning laws to allow for more density
- Expedite permitting for more efficient construction
- Create more zoning opportunities for solar

TOPIC: MOBILITY

Motor Vehicle Electrification

- Require new construction to include EV charging stations and expand existing charging (chargers in low demand areas, car-sharing, ride-hailing, Park and Ride lots)
- Allow homeowners to make chargers available/charge others to use
- Encourage/support electrifying car-sharing. Implement a shared-use program (City)
- Incentivize/Convert fleets to EV (City, car sharing, ride-hailing, commercial delivery needs)
- Create a total cost of ownership target commitment for EVs
- Pair EV charging stations (both private and public) with solar power (and storage)
- Set up EV bulk buy program (for individuals, institutions, employers)
- Subsidize EVs and charging for low income households
- Organize buyback program for ICE vehicles
- Encourage pilot/autonomous vehicle programs, electric delivery options. Infrastructure (5G, DSRC, Wifi) that enables connected and autonomous vehicles
- Reduce congestion at chargers by using rotating system (people could be employed to switch chargers between cars?) that emphasizes fast charging, not charging to full battery
- Make battery recycle program for utility batteries to be used in school and public buses
- Hub deliveries to downtown (larger vehicles stay outside of downtown area and transfer deliveries to smaller green vehicles)
- DTE Energy: Coordinate a Workplace Charging Challenge with DTE, Leverage DTE rebates
- Require/encourage electrifying lawn equipment

Active Transportation

- Implement e-bike and e-scooter program to electrify short-distance travel. Offer safe options for riding e-bikes and e-scooters.
- Expand sidewalks and crosswalks in areas that are currently un-walkable
- Maintain and repair bike lanes preferentially (including clearing gravel). Improve snow-clearing to encourage biking and walking year-round.
- Make more bike lanes. Improve bike access to downtown. Increase regional/connected bikeways
- Make more protected bike lanes or elevated bikeways. Prioritize safety on scenic bike routes. Increase bike lanes separated from roads (greenways)
- Expand services like "Common Cycle," a volunteer-based bike repair clinic
- Encourage bike banks/bike sharing
- Provide City snow clearing of sidewalks
- Make interconnecting with public transit easier (allow bikes inside buses)
- Enforce codes protecting bikes and bike lanes (driving distance, parking and obstructions in bike lanes)
- Traffic signals reflect active transport needs and prioritize safety. Safer lighting for crosswalks and bike lanes.
- Add skywalks between major buildings

Transit and Paratransit

- Make public transportation free
- Expand Go-Pass area. Reduce transit fees/offer pass deals (annual)
- Expand TheRide bus routes and connect routes more
- Increase the speed and efficiency of bus transit. Provide rapid transit along major corridors
- Use better technology to make bus system more accurate, on-time, etc.
- Power bus stop shelters with solar power (security lighting, cameras, and info)
- Create bus and carpool lanes
- Create student shuttles to reduce demand for student cars (e.g. shuttle from campus to nearest grocery stores). Collaborate with/address UM transit. Work with UM to create incentives for students not to bring cars on campus. Make shuttle to WCC.
- Develop light rail (commuter, local). Develop electrified regional public transit
- Electrify TheRide vehicles
- "Right size" transit vehicles
- Create "mobility hubs" dispersed through city that act as home-base for multiple transit options (e-bikes, e-scooters, zip cars, bus stops, EV chargers, autonomous delivery vehicles, carpools, etc.)
- Improve public school transit (school of choice, etc.)
- Increase availability and convenience of Park and Ride lots for commuters
- Allow multiple modes of fare payment
- Encourage alternatives to flying (increase trains, etc.)

Policies, Funding, Public Outreach, and Education

- "Upzone" to encourage density and affordability. Make zoning allowances for mixed-use neighborhoods. Walkable grocery stores. Encourage tiny houses and accessory dwelling units (ADUs). Transit-oriented urban planning along transit corridors
- Build affordable workforce housing near workplaces to reduce commuting
- Incentivize work-from-home, 4-day-work-week, and shorter work day policies (with health care credits, bonuses, etc.) to reduce employee commuting. Provide free internet to support telecommuting
- Reduce availability of parking, reduce/eliminate parking minimums. Work towards a parking-space free campus. Tax vacant lots and development of new parking lots
- Enact car-free (or petrol-free) zones. Make downtown pedestrian-only on weekends, linked with shuttles from Park-n-Rides
- Implement odometer tax or congestion tax. Price vehicles on occupancy. Implement City gasoline tax on pumps/new development. Tax large local industries. Implement City income tax
- Enforce no idling laws
- Alter Act 51 (act for distributing funds for road infrastructure) to give locals more control over types of projects. Lobby for state policy that creates a dedicated funding source for non-motorized and electric transportation (like there is for highways)
- Lobby to eliminate state registration fees for EVs
- Increase education about biking and walking through middle and high school (there is nothing after Safety Town). Incentivize driver's education programs use EVs
- Create education, certification, and/or incentive program for auto dealers to sell EVs. Develop certification program for EV-qualified maintenance shops
- Leverage Forth Mobility for education and outreach
- Work with health-care systems to educate patients about health benefits of active transportation
- Leave behind level of service measures – use a better method like people through-put

- Adopt transportation pyramid (walking as priority to single occupancy driving at the bottom). Carbon neutrality mobility requirements in master plan
- Permeable pavement
- One-way street design
- Encourage carpooling for larger companies using apps
- Spotlight organizations who are taking action/success stories. Provide sample sites, pilots, and working examples of new ideas
- Help people understand their carbon footprint related to transportation and impact of changes

Process-Related

- Improve GHG tracking from transportation
- Using property taxes for funding can create equity concerns
- Always consider accessibility concerns
- Run lifecycle analysis on all ideas to see what is most effective
- Youth need to be at the table
- Carbon off-sets and sequestration (for travel)
- Plans from other communities with carbon neutrality goals (statewide coalition to move legislation at the state level)

TOPIC: RESOURCE REDUCTION

Waste Reduction

- Conduct environmentally-extended input-output analysis: City, University, hospitals
- Create a Zero Waste Plan
- Require all city-wide events be Zero Waste
- Leverage partnerships
- Report out on what happens to recovered waste
- Discourage landfilled waste:
  - Extend time between trash pick ups
  - Initiate payment by amount of trash model
  - Limit size of/availability of containers
  - Use funds from trash can fees for educational campaign
- Reduce single use plastics:
  - Organize a local cohort of business who do not use single use plastics
  - Tax/ban single use plastics (bags, takeaway containers, etc.)
  - Require bottle-filling stations
  - Encourage/enable price incentives for using reusable containers
  - A^2Zero branded compostable alternatives to single-use plastics
- Electrify waste truck fleet
- Choose/require methane recovery at landfills in active use

Recycling

- Renovate city-owned Materials Recovery Facility
- Develop new city-owned Materials Recovery Facility
- Educate public/resolve recycling uncertainty
- Eliminate drop-off fees for recycling

- Multi-stream recycling pick-up
- Neighborhood level recycling rather than drop-off
- Improve textile recycling
- Enforce recycling

Organics

- Address waste water
- Methane recovery on waste water (Cross cutting: Energy)
- Improve composting pick up:
- Accessible to commercial, industrial, multi-family
- Ease of use
- Year round composting
- Local composting:
- Compost in neighborhoods/locally
- Return to local farmers
- Provide free compost to residents
- Create compost market
- Encourage/incentivize/educate on homeowner composting
- Provide information on environmental impacts of different compostable materials

Plant Based Diets

- Scale pledge programs, Blue Zone Program
- Incorporate AAPS and institutions
- Provide cooking classes focused on plant-based, local, seasonal foods (Rec & Ed)
- Education/ban on commodity beef/CAFO meat

Local Food Production

- Scale community gardens/local food production
- Local food waste recovery (gardeners, farms, restaurants, grocery stores)
- Farmers Markets Expansion
- Year round
- More locations
- Expanded food hubs/food stops/local food in grocery stores
- Protect SNAP in appropriate scaled sizes
- Pilot local food subscription meals with circular/reusable packaging
- Collaborate with AAPS, UM on food planning, purchasing, and waste

Circular Economy

- Reskilling and skill sharing opportunities
- Repair centers for bikes, appliances, etc.
- Toy and tool library/shed, shared play areas
- Support thrift stores, reuse center, flea markets
- Create a time bank/local currency

Sustainable Purchasing

- Charge a carbon price on the embedded GHG of products
- Create a local market for reusable goods
- Closed loop reusable packaging
- Offer refillable bulk containers, takeout containers, cups (at point of sale)
- Create/enforce purchasing policies, guidelines, or incentives for:
  - Municipal operations
  - Institutions
  - Individuals
- Create consumption-based inventories for:
  - The City
  - Institutions

Construction and Development

- Require sustainable materials in new development

Community Engagement

- Engage with commercial and institutional sector
- Commercial reuse packaging program
- Accelerate/scale current data collection/plans:
  - Green Business Challenge
  - Engagement with private sector
  - Require/encourage disclosure from businesses/community groups

Community/Education

- Publicize available data/educate on:
  - Decreasing and recovering food waste
  - Reducing packaging, single use plastics
  - Purchasing transparency: traceable, embedded GHG, recyclability/compostable, Energy Star
  - Increasing composting and its benefits
  - What is recyclable and how to recycle
- Ongoing community engagement team (provide inventory management)
- Demystify terminology
- Compost at schools, local food at schools
  - School curriculum on environmental science
- Link to public health initiatives (diet, pollution)
- Recognition program for successes, spotlight organizations who are taking action
- Promote sample sites, pilots, and working examples

TOPIC: RESOURCE REDUCTION

Preparation

- Develop new/leverage existing infrastructure as resilience hubs
- Activate some homes as shelters with resources, energy, etc.
- Identify safe gathering points in neighborhoods during power outages, extreme heat/cold, etc.
- Conduct needs mapping of neighborhoods based on specific support residents require
- Generate neighborhood-based resiliency plans, incorporate residential best practices.

- Activate neighborhood climate ambassadors/captains to help
- Enable/organize ongoing training via Red Cross/CERT/partners
- Coordinate across Red Cross/AmeriCorps/partners
- Develop redundant communication (e.g., Code Red), not dependent on internet
- Assist/organize preparing/distribute residential emergency kits
- Host a National Preparedness Month campaign
- Engage behavior change scientists and define actors/actuators
- Conduct risk assessments and incorporate into planning
- Conduct a resilience-aesthetic charrette
- Strengthen relationships with other local governments

Community cohesion

- Activate strong neighborhood community networks that support local efforts
- Activate neighborhood welcome ambassadors
- Educate and engage community on the expected risks/how to prepare/how to respond, sharing experiences, climate tours
- Increase local workshops and space for public input
- Youth participation/education through actions/videos/ambassadors/curriculum/training/competitions
- Develop a program to recognize neighborhood-level efforts
- Enable/organize block parties for energy/resilience themes
- Provide support for emotional resilience, grief management, psychological services, etc.
- Create shared childcare programs.
- Create communal kitchens

Response

- Develop climate refugee support/networks
- Develop program to use city buses for evacuation and power sources during a disaster

Urban Planning

- Implement/leverage sensors and data to monitor heat, air quality, waterway and floods. Assist with drones for data/response.
- Track public health metrics from state and CDC
- Urban planning to moderate heat via shade trees, lighter contract, more rain gardens
- Design for increased urban density and walkability/bike-ability. Update city zoning.
- Street trees: Analysis of shading/inventory/update master plan/incentivize private tree planting
- Improve parking lot design standards for shading, storm water retention, heat island mitigation, trees
- Incentivize white/green roofs
- Purchase repetitive loss properties. Redevelop vacant space as green space.
- Prioritize affordable housing.
- Require all City functions be zero waste.
- Allow/encourage telecommuting

Energy

- Transition to underground power lines
- Create redundancy in energy systems (storage)
- Decentralize energy infrastructure. Incentivize individual energy production.
- Increase renewable energy systems, storage, microgrids, and community solar.

- Plan for higher energy loads due to increasing temperatures.

Green Spaces

- Connect green spaces
- Increase natural area preservation and stewardship for carbon sequestration and storm water management
- Educate on native and invasive plants
- Increase land use for local food production. Host an improved food infrastructure innovation challenge.
- Encourage fruit trees/foraging, collect fallen fruit. Allow food production on city lands in neighborhoods.

Water

- Enable/encourage water generation and reuse and natural water/flood capture systems
- Design flexible water systems that adapt to conditions
- Remove dams/coordinate dam management
- Use accessory dwelling units for drinking water security
- Add vegetated buffers along waterways for storm water management
- Stricter floodway/floodplain management/planning

Transportation

- Design roads for flexibility, networked, alternative transportation, slower traffic, storm water management, trees, boulevards, durability. Fully implement green streets.
- Leverage Common Cycle to keep bikes on the road
- Encourage/enable car sharing
- Minimize parking available
- Install EV chargers at stores/apartments

Residential/Commercial Support

- Define and educate on residential best management practices
- Create a resilience fund/funding focused on equity
- Educate on DTE Energy support for energy efficiency upgrades
- Strengthen building code for efficiency/weatherization. Require 2030 District standards across all buildings.

As Amended and Approved by Ann Arbor City Council on June 1, 2020


A2ZERO
EQUITABLE • SUSTAINABLE • TRANSFORMATIVE