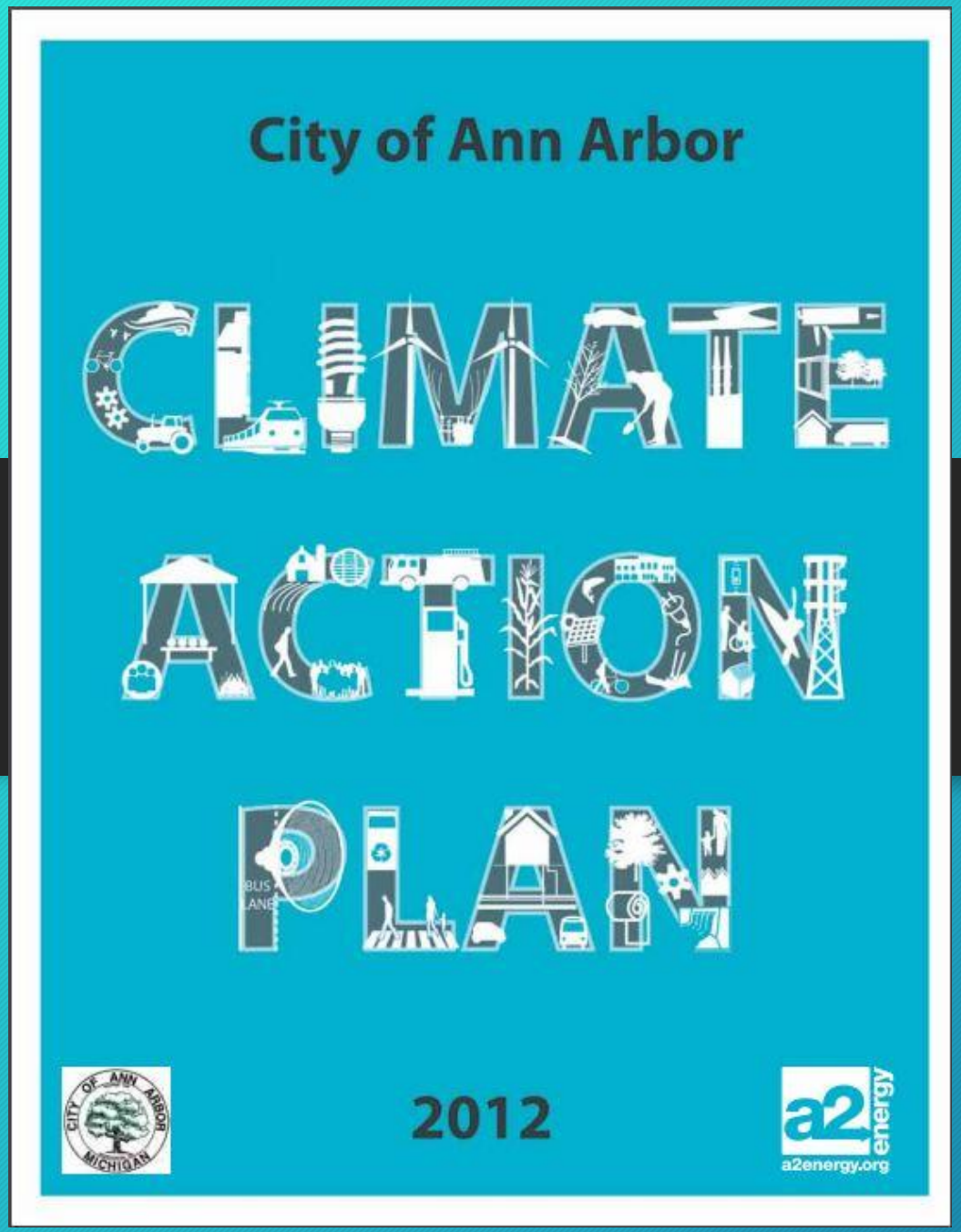


SustainA2ble

Cultivating our people, place and potential

Presentation to the Ann Arbor Transportation Commission

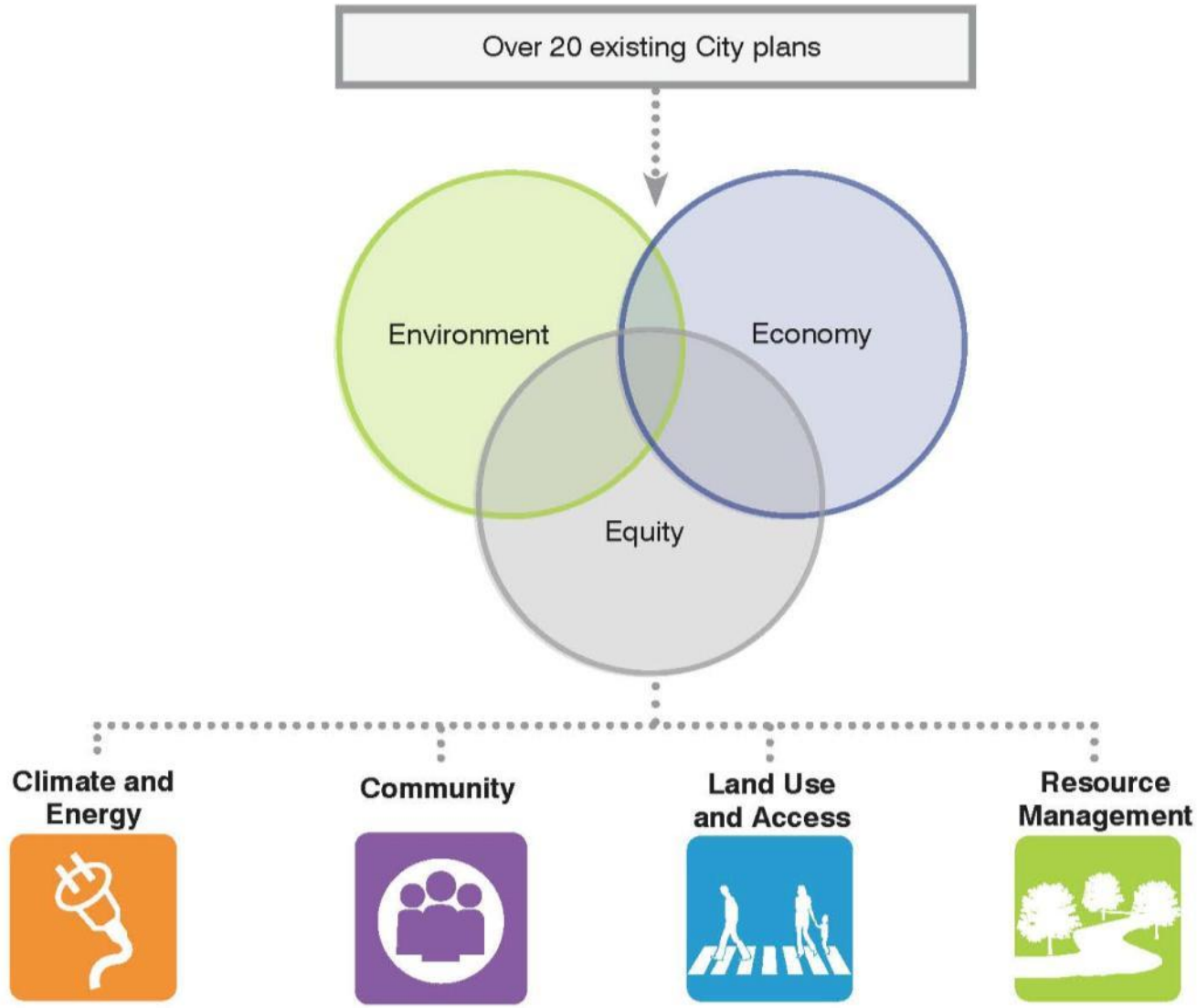
May 17, 2017

SustainA2ble

Cultivating our people, place and potential

PROTECT OUR SPOT A2 ON THE BIG BLUE DOT
Ann Arbor, Michigan

Why Create a Framework?


Over 20 existing City plans
Environment
Economy
Equity
Climate and Energy
Community
Land Use and Access
Resource Management

Ann Arbor's Sustainability Framework

- 16 overarching sustainability goals captured in four theme areas
- Adopted as policy guidance for the Master Plan in February 2013

Climate and Energy | Community | Land Use and Access | Resource Management

Climate and Energy

Sustainable Energy

Energy Conservation

Sustainable Buildings

Community

Engaged Community

Diverse Housing

Human Services

Safe Community

Active Living

Economic Vitality

Land Use and Access

Transportation Options

Sustainable Systems

Integrated Land Use

Resource Management

Clean Air and Water

Healthy Ecosystems

Responsible Resource Use

Local Food

	SCORING	Low ← → High				
1	**Sustainability Framework Goals**	**0** Contributes to meeting 1 or less of the City's Sustainability Framework Goals	**3** Modestly contributes to meeting two to three of the City's Sustainability Framework goals	**7** Significantly contributes to meeting two or three of the City's Sustainability Framework goals OR modestly contributes to meeting four of more of the City's Sustainability Framework goals		**10** Significantly contributes to meeting 4 or more of the City's Sustainability Framework goals
2	**Safety/Compliance/Emergency Preparedness**	**0** Does not address safety or emergency preparedness considerations	**2** Contributes to meeting public safety, but is not required for compliance	**5** Will assist in ability to continue governmental services during emergencies	**8** Necessary to meet recommended compliance OR will maximize public safety opportunities	**10** Contributes to mandatory compliance OR will prevent potential injury to staff OR is necessary to assure continuance of governmental services during emergencies
3	**Funding**	**0** Has no potential funding	**2** Has uncertain funding source(s) (e.g., Special Assessment, General Fund)	**6** Funding available from standard City funding sources (e.g., utility rates, road millage, etc.)	**8** Has high probability of funding from low-interest loan source (e.g., DWRF, SRF, Energy Fund, etc.) OR partial project funding (<80%) from outside source(s)	**10** Has high probability of receiving substantial (≥80%) project funding from outside sources (e.g., grant funding, developer, Township financed)
4	**Coordination with Other Projects**	**0** There are no other planned projects that should be coordinated with this Project	**5** Costs can be modestly reduced by performing project with another project	**8** Schedule is driven by other improvements (e.g., street reconstruction, adjacent utility replacement) resulting in significant (>33%) opportunity cost if project is not completed concurrently with adjacent work		**10** Schedule is driven by other high-priority improvements that must be completed within the next two fiscal years
5	**Master Plan Objectives**	**0** Does not contribute to meeting any of the City's master plan or other strategic planning document goals	**3** Modestly contributes to meeting one of the City's master plan or other strategic planning document goals	**6** Significantly contributes to meeting one of the City's master plan or other strategic planning document goals OR modestly contributes to meeting two or more of the City's master plan or other strategic planning document goals		**10** Significantly contributes to meeting two or more of the City's master plan or other strategic planning document goals

6	**User Experience (Level of Service)**	0 Will reduce the quality of the User Experience (Level of Service)	2 Will not affect Level of Service	4 Modestly improves existing Level of Service	10 Significantly improves existing Level of Service OR provides a new service which is requested by the community
7	**Innovation**	0 Does not include any innovative measures or items	3 Modestly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's	7 Significantly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's on a small scale	10 Significantly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's on a large scale
8	**Economic Development/Retention**	0 Will not have any effect on economic development/retention	5 Will have modest effect on economic development/retention	10 Will have significant effect on economic development/retention	
9	**Partnerships**	0 Does not provide opportunity for partnerships	3 Promotes regional or interagency planning and coordination OR public/private partnership	10 Promotes regional or interagency planning and coordination OR public/private partnership AND provides for shared staffing resources	
10	**System Influence/Capacity**	0 Does not contribute to larger system network or user demand	3 Meets future user demand	6 Addresses immediate user demand that benefits a portion of the user population	10 Addresses immediate user demand that benefits entire user population
11	**O&M (Operations & Maintenance)**	0 Will cause increase in O&M costs	2 Has a neutral effect on O&M costs	6 Makes modest contribution to O&M cost reduction	8 Makes modest contribution to O&M cost reduction AND creates opportunities to improve operational flexibility/use of technology, or extends asset life	10 Makes significant contribution to O&M cost reduction AND creates opportunities to maximize operational flexibility/use of technology, or extends asset life, or utilizes materials or techniques that provide lowest overall life-cycle costs
12	**Energy**	0 Will cause increase in energy costs	2 Has a neutral effect on energy costs	5 Makes modest contribution to energy cost reduction	8 Makes modest contribution to energy cost reduction AND creates opportunities to improve operational flexibility/use of renewable energy	10 Makes significant contribution to energy cost reduction AND creates opportunities to maximize operational flexibility/use of renewable energy

STAR COMMUNITIES

SUSTAINABILITY TOOLS FOR ASSESSING & RATING COMMUNITIES

SET GOALS.
MEASURE PROGRESS.
IMPROVE YOUR COMMUNITY.

Climate Changes in Ann Arbor

Recorded Changes over last 60 years

- 1°F average temperature increase
- 44.8% more rain annually
- 41.2% more “very heavy” precipitation days

Projected Changes over next 40 years

- 3-5°F average temperature increase
- Growing season extended by 1-2 months
- More high temperature days

CLIMATE CENTER
UNIVERSITY OF MICHIGAN
A CENTER OF THE GRAHAM SUSTAINABILITY INSTITUTE

GRAHAM.UMICH.EDU/CLIMATE

City Fact Sheet: Ann Arbor, MI

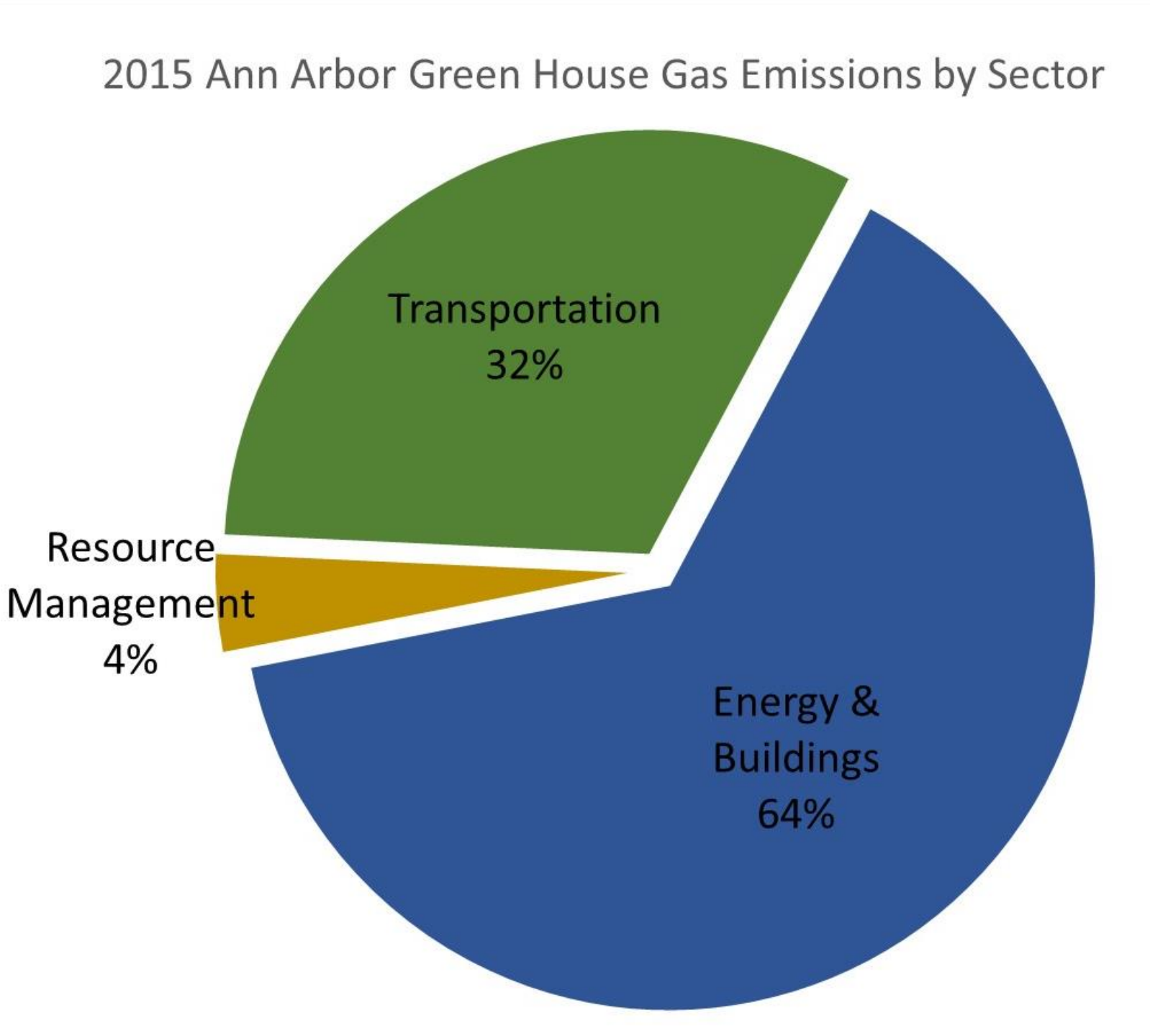
Geographic Location	S.E. Michigan Non-Coastal
Population	113,934
Government Structure	Council-Manager
Per Capita Income	$30,498 (USD)

The City of Ann Arbor has a long history as a progressive city with strong community engagement. Despite this, the city faces challenges keeping the community informed of emerging programs and ongoing efforts due to the city's many university students and other transient residents. Ann Arbor also faces the challenge that a significant percentage of property within the city limits falls under the public domain and is not subject to local taxes. Much of this public land also falls outside of the city's regulatory jurisdiction.

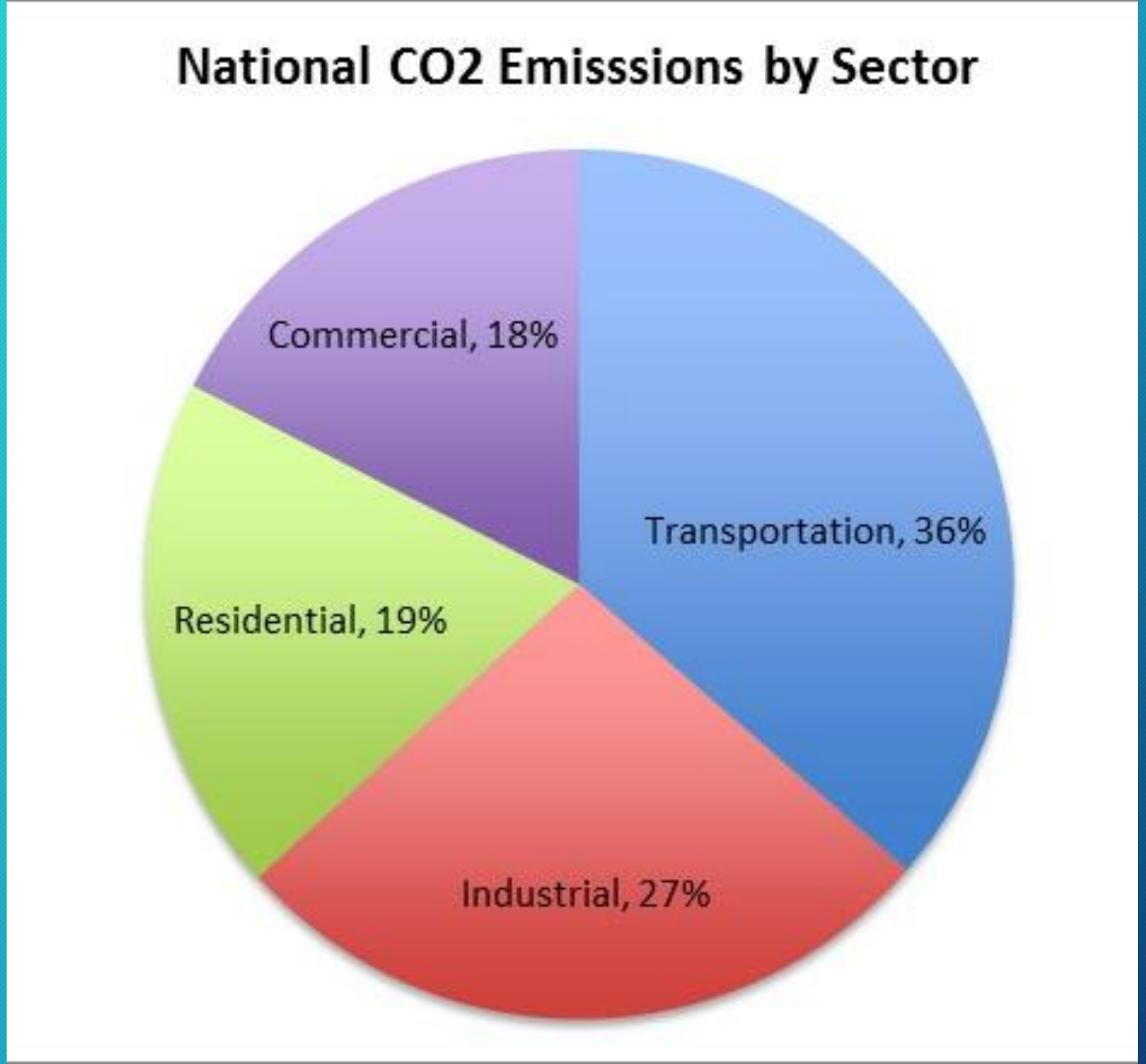
CLIMATE IMPACT

1°F	Increase in Annual Temperatures (from 1951-2012)
6.1	Fewer Days Below 32°F (from 1951-2012)
41.2%	Increase in Heaviest 1% of Precipitation Events (from 1951-2012)
44.8%	Increase in Annual Precipitation (from 1951-2012)

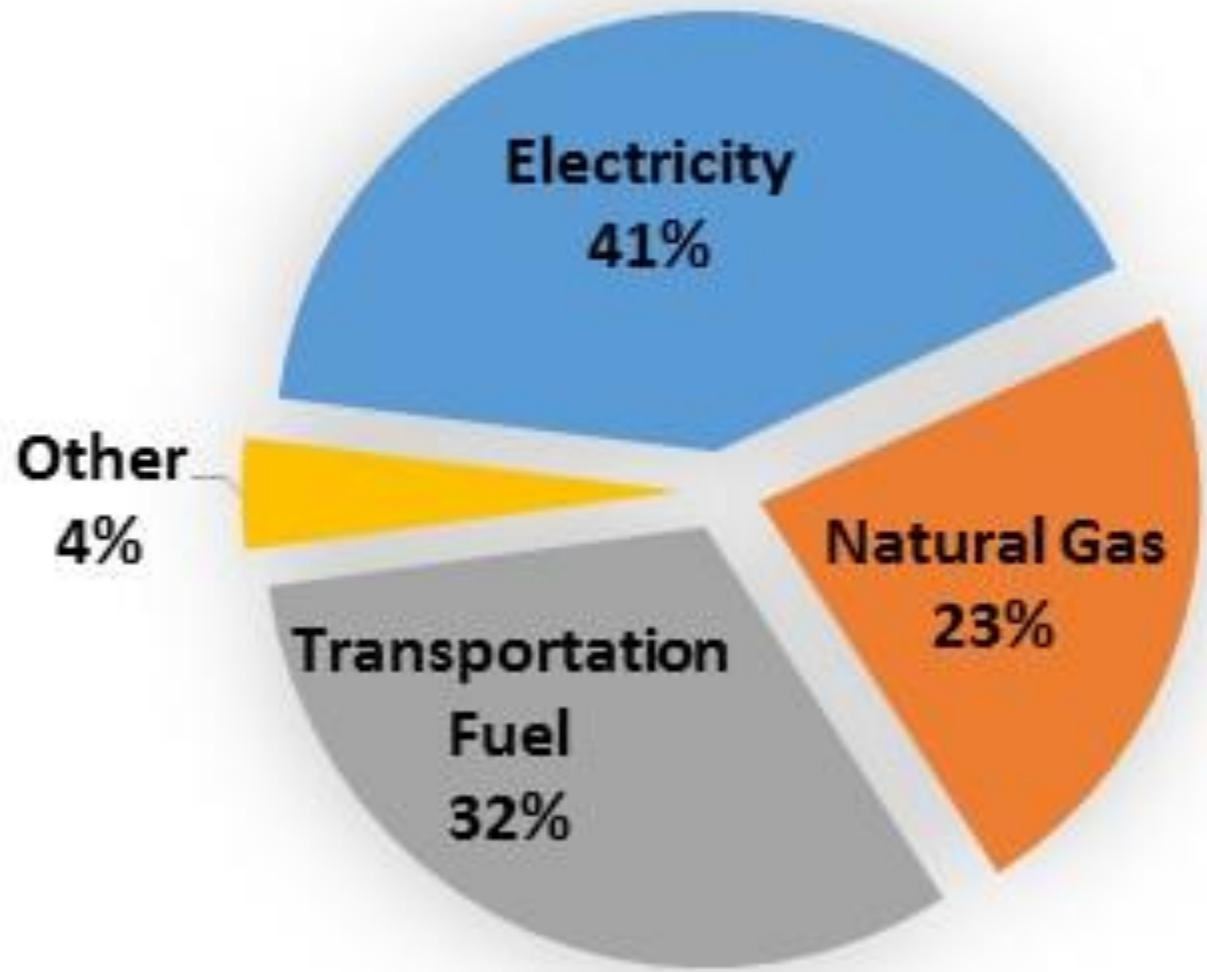
www.graham.umich.edu/science/climate


2015 Ann Arbor Green House Gas Emissions by Sector
Transportation
32%
Resource
Management
4%
Energy &
Buildings
64%

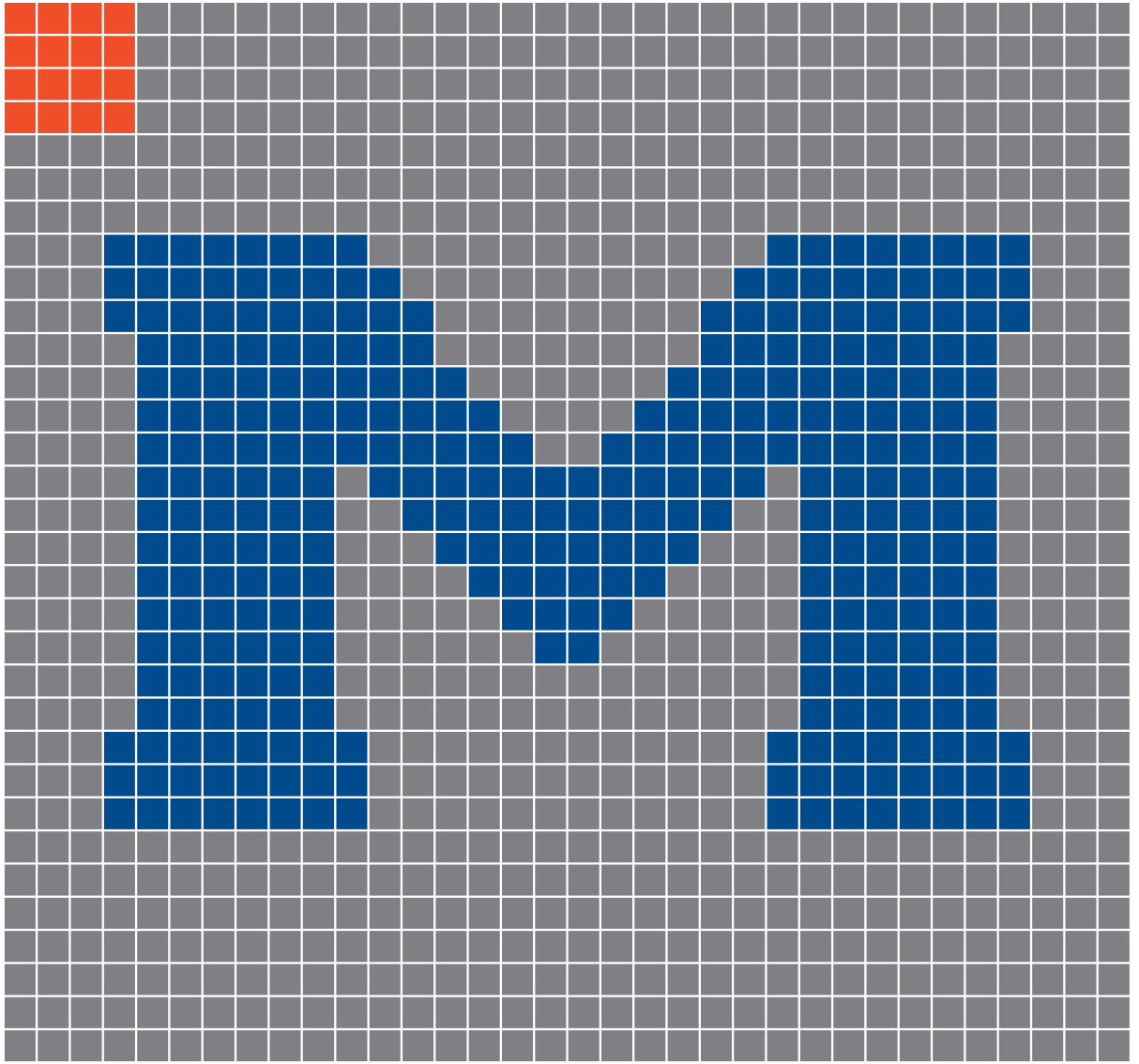
DRAFT


National CO2 Emisssions by Sector
Commercial, 18%
Transportation, 36%
Residential, 19%
Industrial, 27%

Ann Arbor Percent of MTCO2e by Energy Source



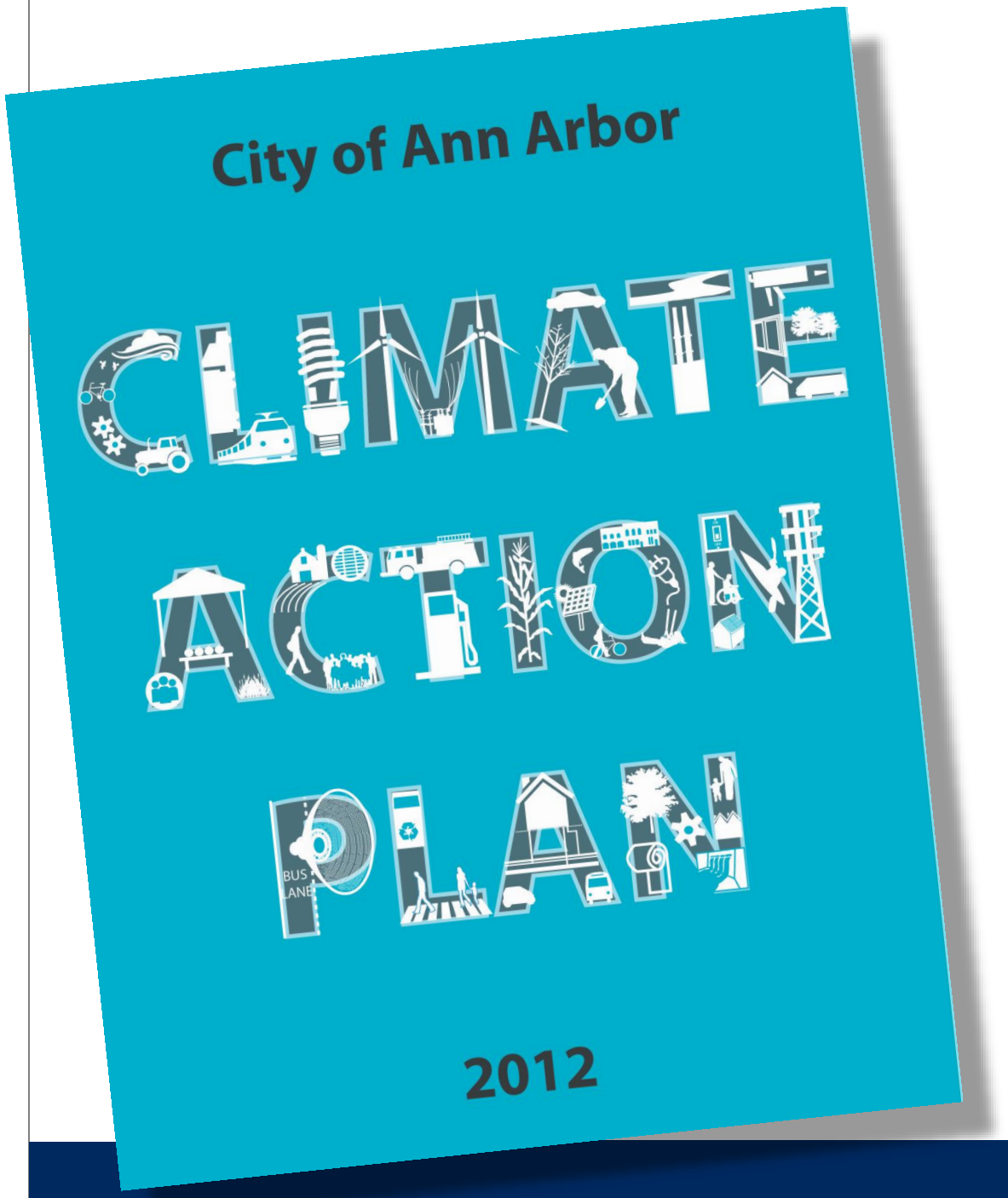
Ann Arbor 2015 Emissions Inventory



2010 municipal emissions
2010 U of M emissions

2,000 MTCO2e = 1 square

PROTECT OUR SPOT A2 ON THE BIG BLUE DOT
Ann Arbor, Michigan



84 Actions

ENERGY AND BUILDINGS

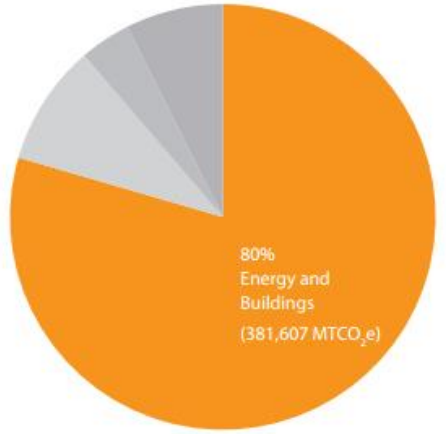
Buildings accounted for 41 percent of the primary energy consumption in the United States (22 percent from residential buildings and 19 percent from commercial buildings) in 2010.[1] The energy used in buildings contributes significantly to GHG emissions in the City of Ann Arbor and makes up 77 percent of the City's total emissions. In order to reach the goal of 25 percent reduction by 2025 or substantial reductions in the future, the City of Ann Arbor and its residents need to reduce energy use in buildings through energy efficiency, and the use of renewable and low-carbon energy sources must increase dramatically. The efficiency of new buildings will need to be addressed through design guidelines and standards.

This section is broken up into three subcategories:

Higher Performing Buildings refers to actions that will increase efficiency in new and existing buildings within our community.

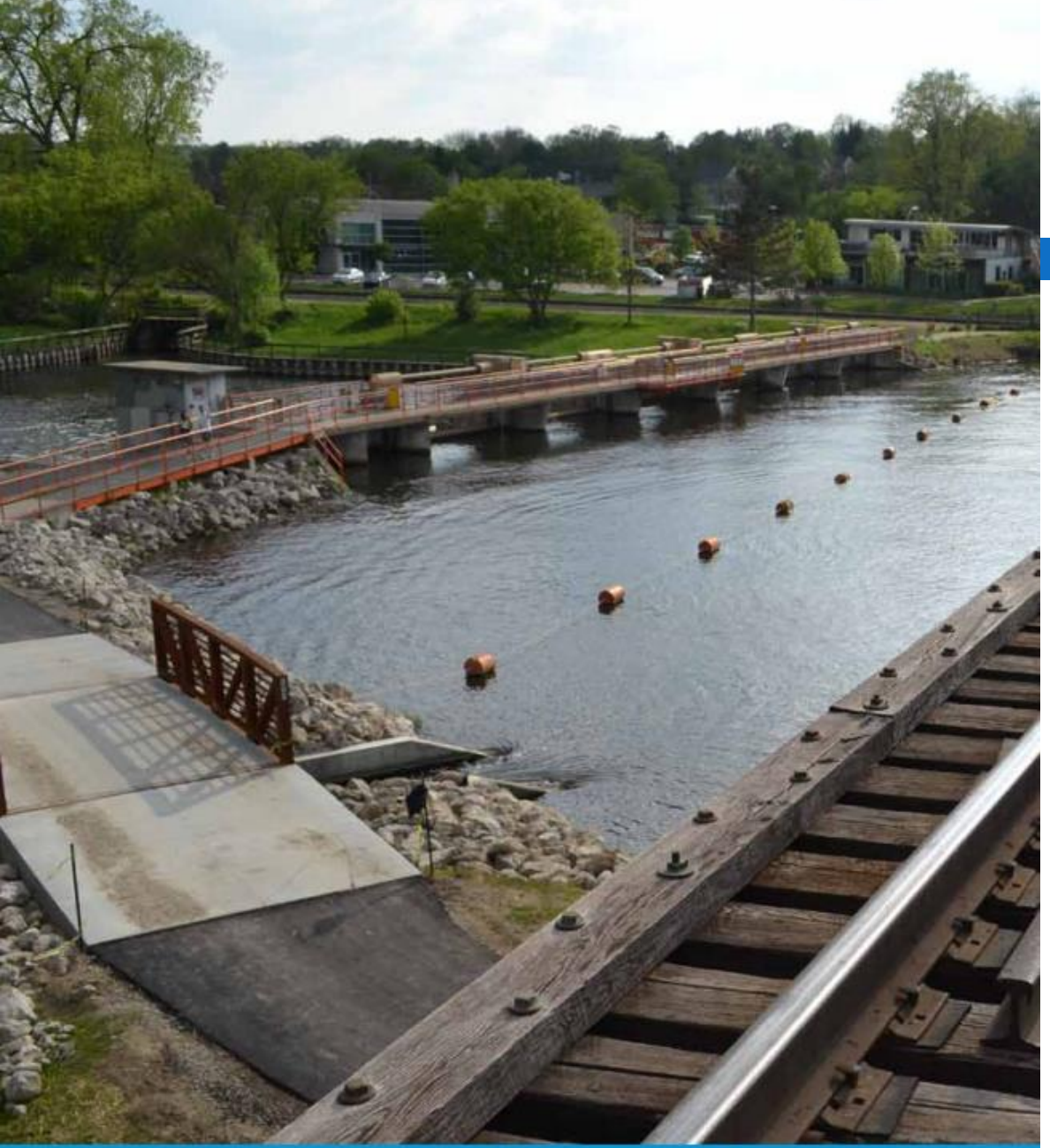
Energy Source refers to the transition from centralized high carbon energy sources to low or no carbon technologies.

Renewable Energy is obtained from resources that cannot be depleted; such as wind, tidal, hydro and solar, photovoltaic and thermal.



Actions identified in this section amount to 80 percent of the total emissions reduced by implementing actions in this Plan

a2 energy



LAND USE AND ACCESS

Understanding the interaction between people's needs and desires to access destinations and how land uses are arranged is important in any attempt to reduce GHG emissions. Land use shapes and is shaped by development of the built environment. Historic dependence on the automobile and conventional zoning that often separated different land uses, like businesses from residences, still impacts how people access local destinations in Ann Arbor, as it does in many other urban areas in the U.S. Personal vehicle travel contributes significant GHG emissions, and while the car is likely to remain the dominant means of transportation for many people in the near future, maximizing public transportation opportunities, creating more bike lanes and better pedestrian infrastructure, supporting low and no emission vehicles, and encouraging more compact development within the downtown and along major transportation corridors will all contribute to reducing fuel consumption and decreasing emissions from travel.

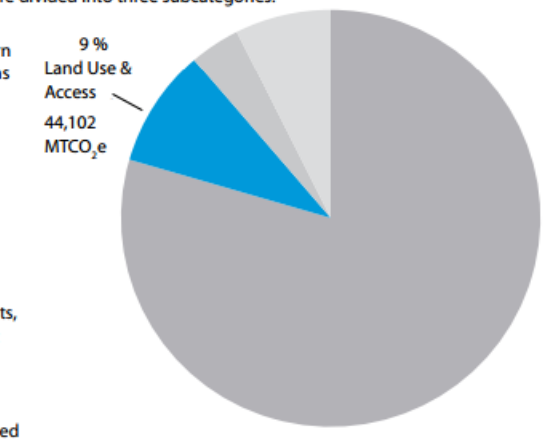
Ann Arbor is committed to reducing vehicle miles traveled (VMT) by increasing access to efficient and sustainable transportation options such as busing, bicycling, or walking, as well as through improving the ways land is developed or left as open and recreational space. The City can continue to encourage a pedestrian-friendly environment that depends less heavily on the automobile to access places of interest.

The actions discussed in this section are divided into three subcategories:

Integrated Land Use for Ann Arbor means encouraging a compact pattern of diverse development that maintains a unique sense of place, preserves natural systems, and strengthens neighborhoods, corridors, and downtown.

Transportation Options refers to establishing a physical and cultural environment that supports and encourages safe, comfortable, and efficient ways for pedestrians, bicyclists, and transit users to travel throughout the city and region.

Sustainable Systems focuses on planning for and managing constructed and natural infrastructure systems to meet the current and future needs of our community.



Actions identified in this section amount to 9 percent of the total emissions reduced by implementing actions in this Plan

a2 energy

RESOURCE MANAGEMENT

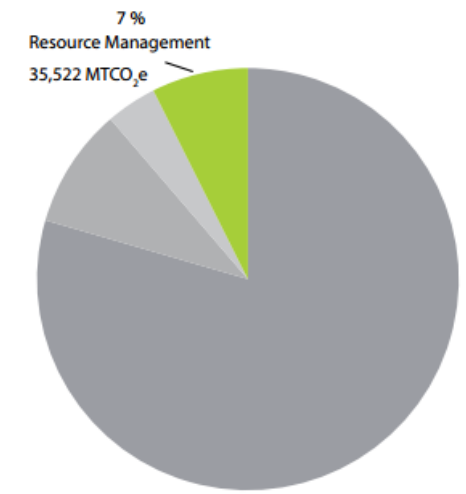
Effective management of our natural resources is essential to mitigate climate change effects and the risks posed to the community. An increase in the severity and frequency of climate-related weather hazards – heavy rain, flooding, ice storms – is the most significant effect predicted for Ann Arbor. In order to minimize the vulnerability of Ann Arbor's built and natural systems, this section of the Plan focuses on actions that protect our natural resources, enhance locally produced food, and expand and diversify the urban forest.

This section is divided into three goal areas:

Responsible Resource Use includes actions to effectively manage water resources, minimize water and wastewater treatment, curb consumption, and decrease the amount of landfilled material by increasing reuse, recycling and composting within the community by all sectors.

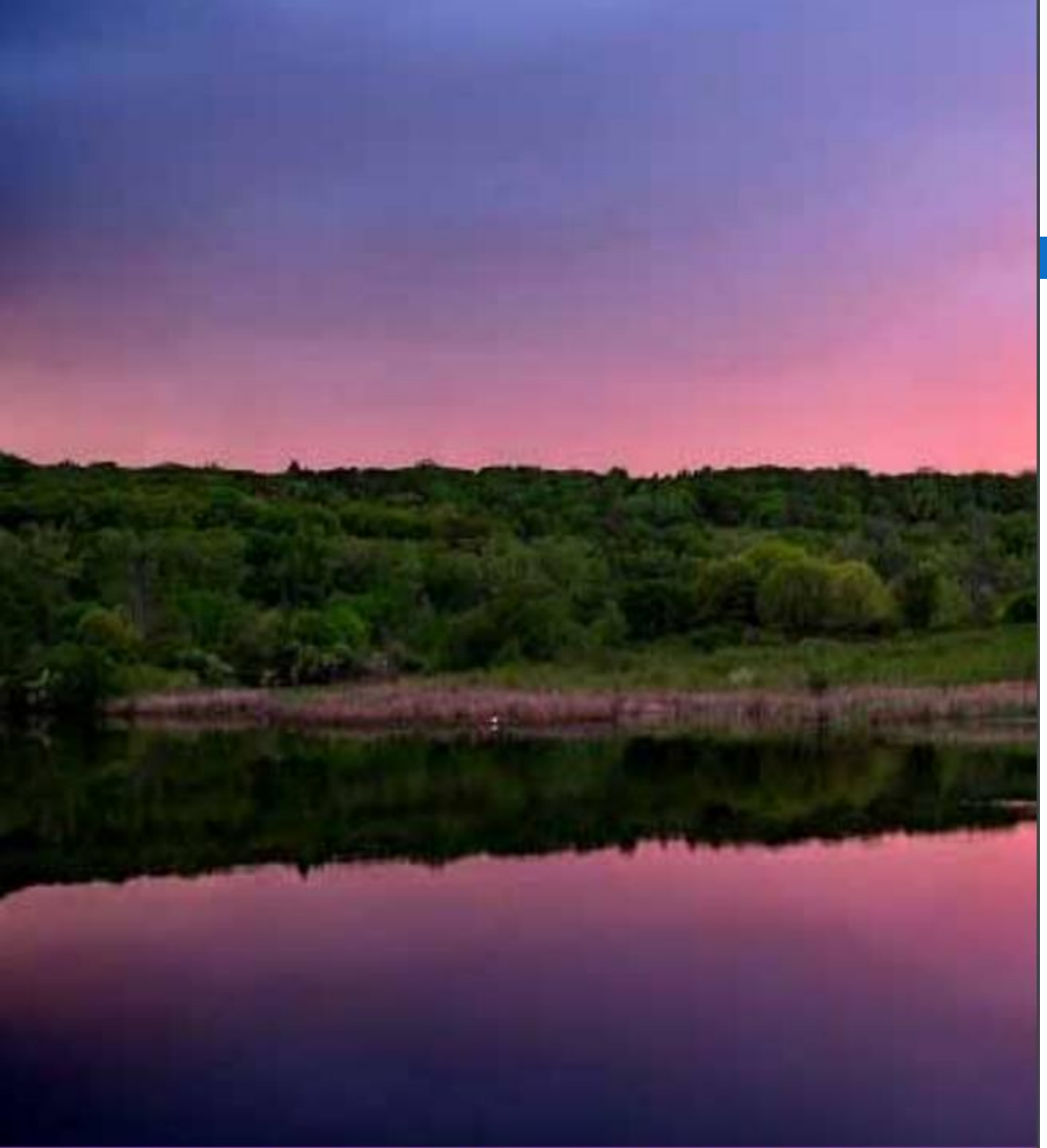
Local Food addresses the need to protect and enhance our local agriculture and aquaculture resources.

Healthy Ecosystems refers to the need to conserve, protect, enhance, and restore our aquatic and terrestrial ecosystems so they can serve as connections for plants and animals while providing valuable community space for humans.



Actions identified in this section amount to 7 percent of the total emissions reduced by implementing actions in this Plan

a2 energy



COMMUNITY AND HEALTH

Climate change is already affecting the lives of Ann Arbor residents in a variety of ways. Our energy sources, built environment, water resources, natural systems, and agricultural systems are vulnerable to a more variable climate - temperature shifts, precipitation changes, more severe weather, increased ground-level ozone, milder winters, and rising summer air temperatures. Human health and safety are particularly at risk when climate changes lead to extreme heat events, declining air quality, increased flooding, and new vector-borne diseases.

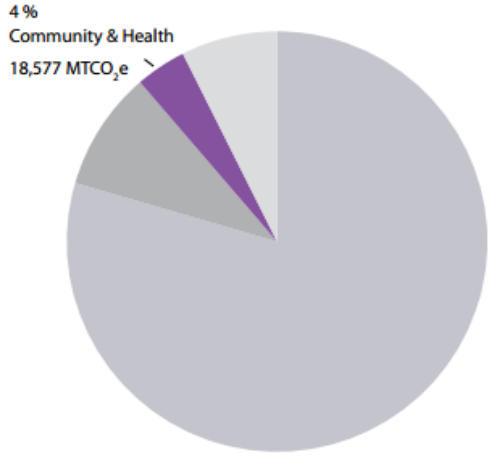
Threats to public health are likely to worsen as impacts from climate change increase. Projections indicate more frequent and intense heat waves, increased smog and particle pollution, and greater chance of waterborne diseases connected to heavy rainfall events. Given the rapid pace with which the climate is changing, these impacts will affect all man-made and natural systems and will only be addressed through a combination of adaption and mitigation actions. In addition, community understanding and action is essential to mitigate the local contributions to climate change, while beginning to adapt to the predicted effects.

This section is divided into three Sustainability goal areas:

Engaged Community focuses on creating an educated, aware, and active community to support Ann Arbor's climate mitigation and adaptation efforts.

Safe Community refers to minimizing the risks to public health and property from the hazards related to climate change.

Adaptation refers to the need to adapt or cope with the inevitable impacts of climate change, regardless of future GHG emission reductions.

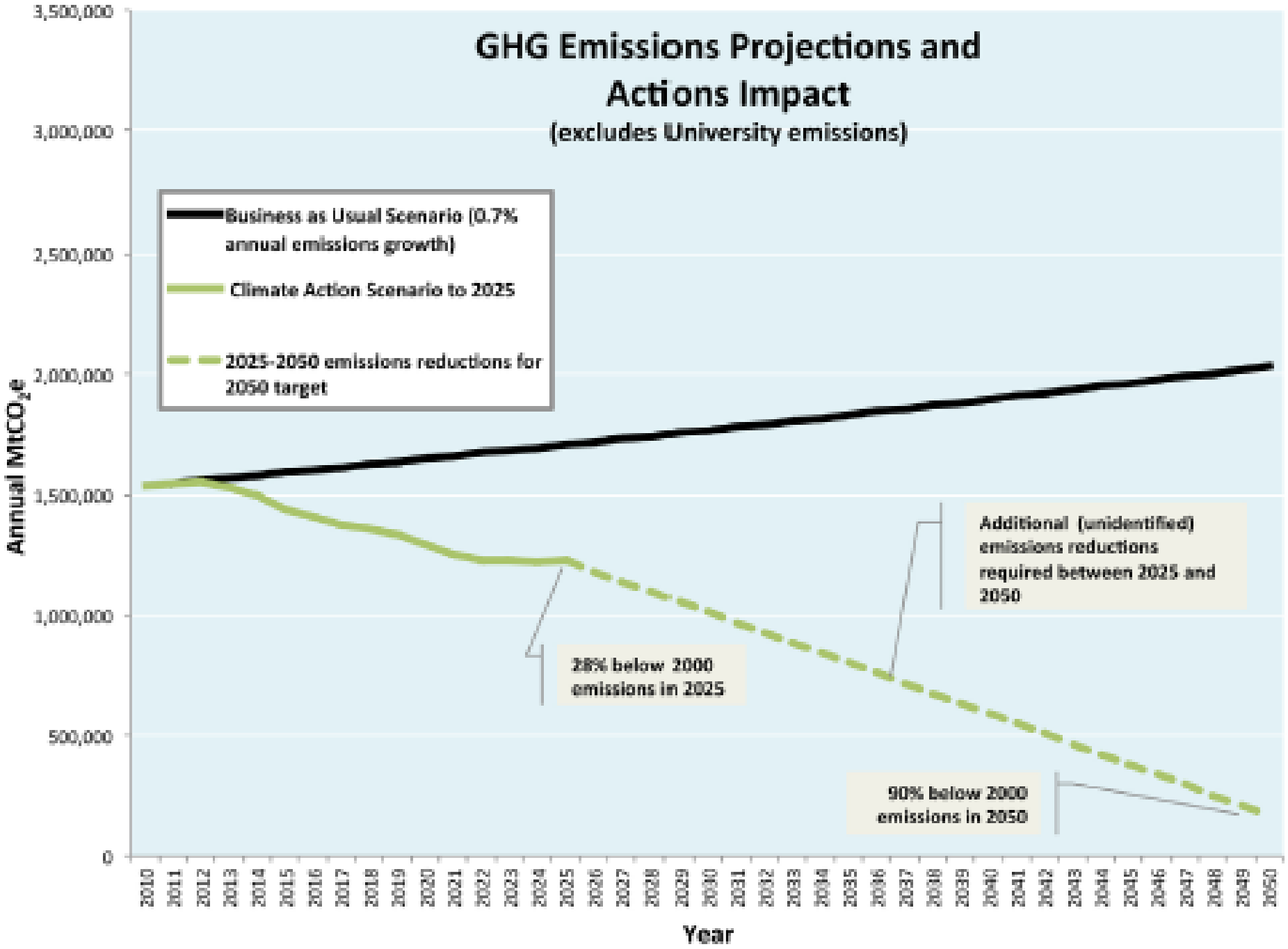


Actions identified in this section amount to 4 percent of the total emissions reduced by implementing actions in this plan

a2 energy

Action Categories	Action Subcategories	# of Actions	Estimated GHG Emissions Reduction ($MTCO_2e$)
Energy and Buildings	Higher Performing Buildings Energy Source Renewable Energy	25	381,607
Land Use and Access	Integrated Land Use Transportation Options Sustainable Systems	21	44,102
Resource Management	Responsible Resource Use Local Food Healthy Ecosystems	25	35,522
Community and Health	Engaged Community Safe Community	13	18,577

Table 1: Climate action categories and subcategories


GHG Emissions Projections and Actions Impact
(excludes University emissions)
Business as Usual Scenario (0.7% annual emissions growth)
Climate Action Scenario to 2025
2025-2050 emissions reductions for 2050 target
Additional (unidentified) emissions reductions required between 2025 and 2050
28% below 2000 emissions in 2025
90% below 2000 emissions in 2050
Annual MtCO2e
Year
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050

-90% by 2050

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2015 - 2016 Corporate Citizenship Report

News Releases

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DTE Energy announces plan to reduce carbon emissions by 80 percent

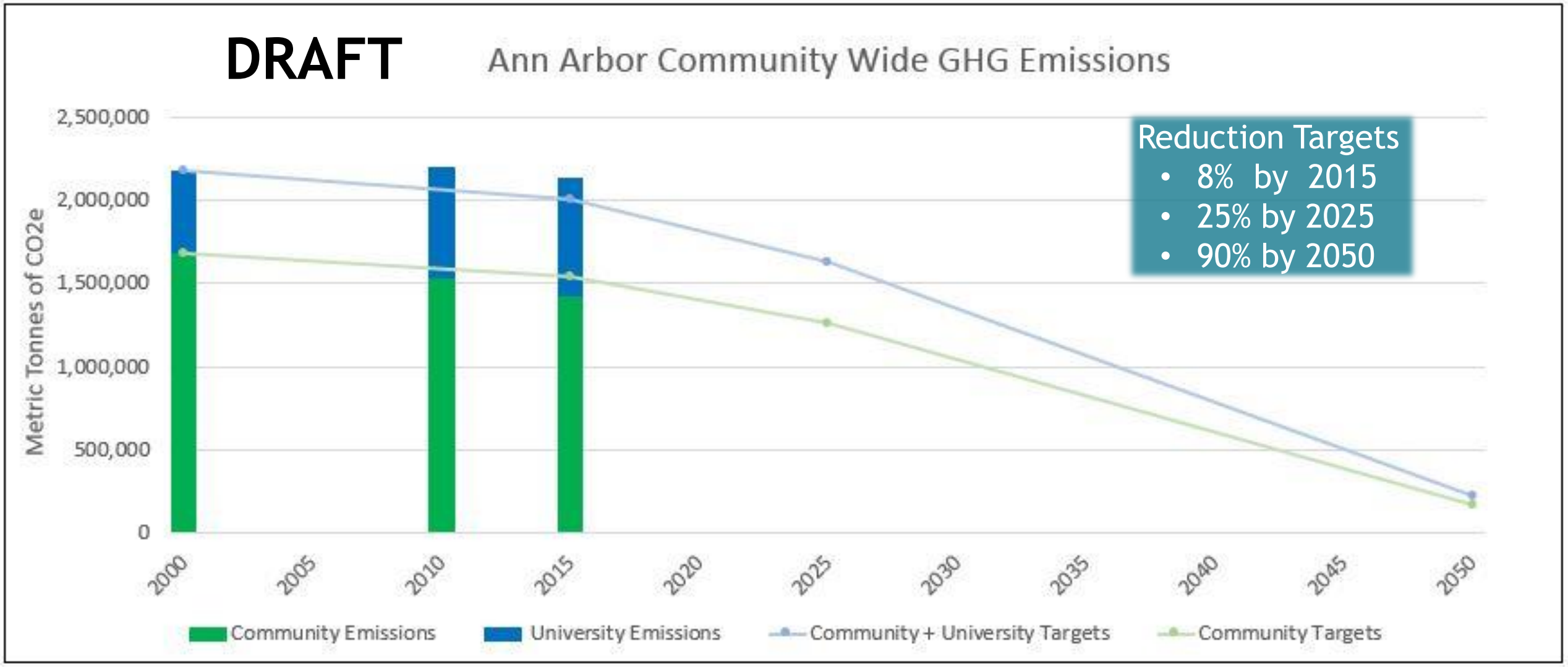
Plan expands renewable energy while maintaining affordability, reliability for customers

DETROIT, May 16, 2017 /PRNewswire/ -- DTE Energy today announced a broad sustainability initiative that will reduce the company's carbon emissions by more than 80 percent by 2050. This reduction and 2050 timeframe align with the target scientists broadly have identified as necessary to help address climate change.

"Over the past two years we have studied the engineering and economics of Michigan's energy future very, very carefully," said Gerry Anderson, DTE Chairman and CEO. "We have concluded that not only is the 80 percent reduction goal achievable – it is achievable in a way that keeps Michigan's power affordable and reliable. There doesn't have to be a choice between the health of our environment or the health of our economy; we can achieve both."

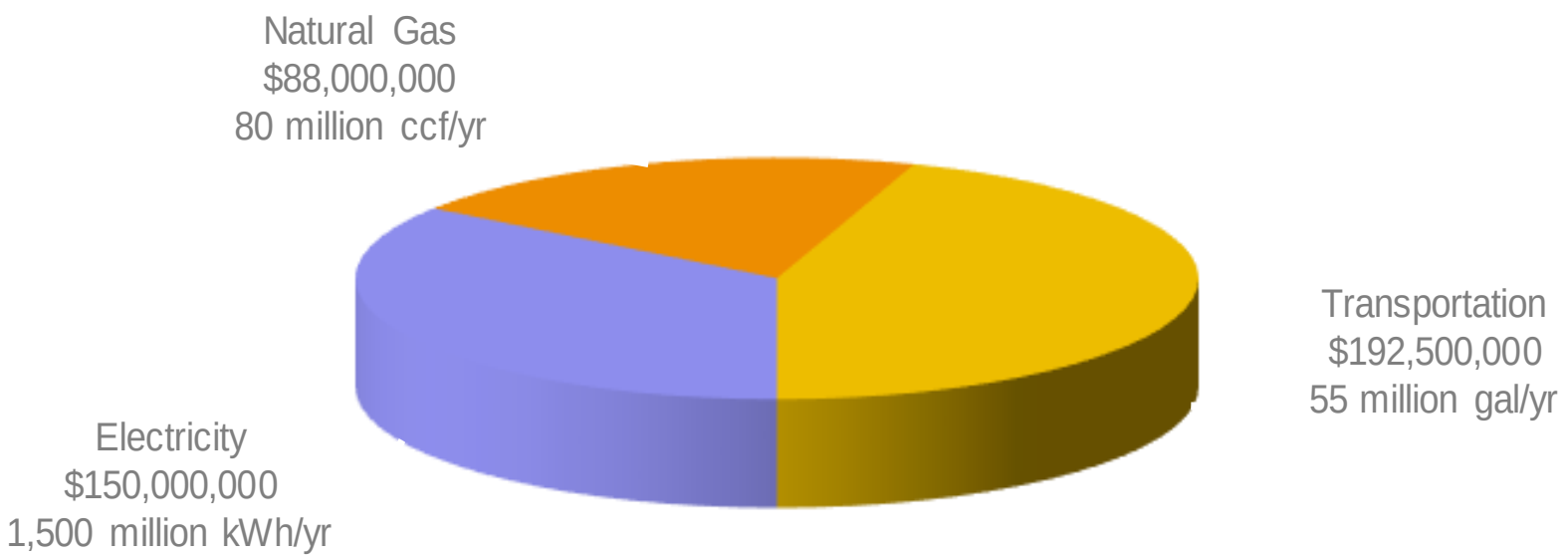
DTE's efforts to cut its carbon emissions will garner a 30 percent reduction by the early 2020s, 45 percent by 2030, 75 percent by 2040 and more than 80 percent by 2050. The company will achieve these reductions by incorporating substantially more renewable energy, transitioning its 24/7 power sources from coal to natural gas, continuing to operate its zero-emission Fermi 2 power plant, and strengthening options for customers to save energy and reduce bills.

DRAFT


Ann Arbor Community Wide GHG Emissions
Metric Tonnes of CO2e
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Reduction Targets
• 8% by 2015
• 25% by 2025
• 90% by 2050
Community Emissions
University Emissions
Community + University Targets
Community Targets

Community Energy & Economic Dev't

Total = $430 million/yr



Natural Gas and Electricity = $238 million/yr;
Transportation= $192,500/yr

The CAP in 2017

- By no means is the CAP perfect or does it perfectly capture the path toward reducing emissions in A2
- Like all Plans it needs to be living and adaptable to new ideas and fresh perspective
- **Plan viewable at: www.a2energy.org/climate**

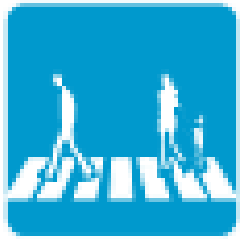
A2CP Land Use and Access Priority Team

Eli Cooper (City)
Larry Deck (Washtenaw Bicycling and Walking Coalition)
Emily Drennen (City)
Nate Geisler (City)
Charles Griffith (Ecology Center)
Mara Herman (Ecology Center)
Brett Lenart (City)
Josh MacDonald (City)
Amber Miller (DDA)
Sarah Pressprich (TheRide)
Lisa Solomon (U of M)
Nathan Voght (County)

A2CLIMATE PARTNERSHIP

Where do you fit in?

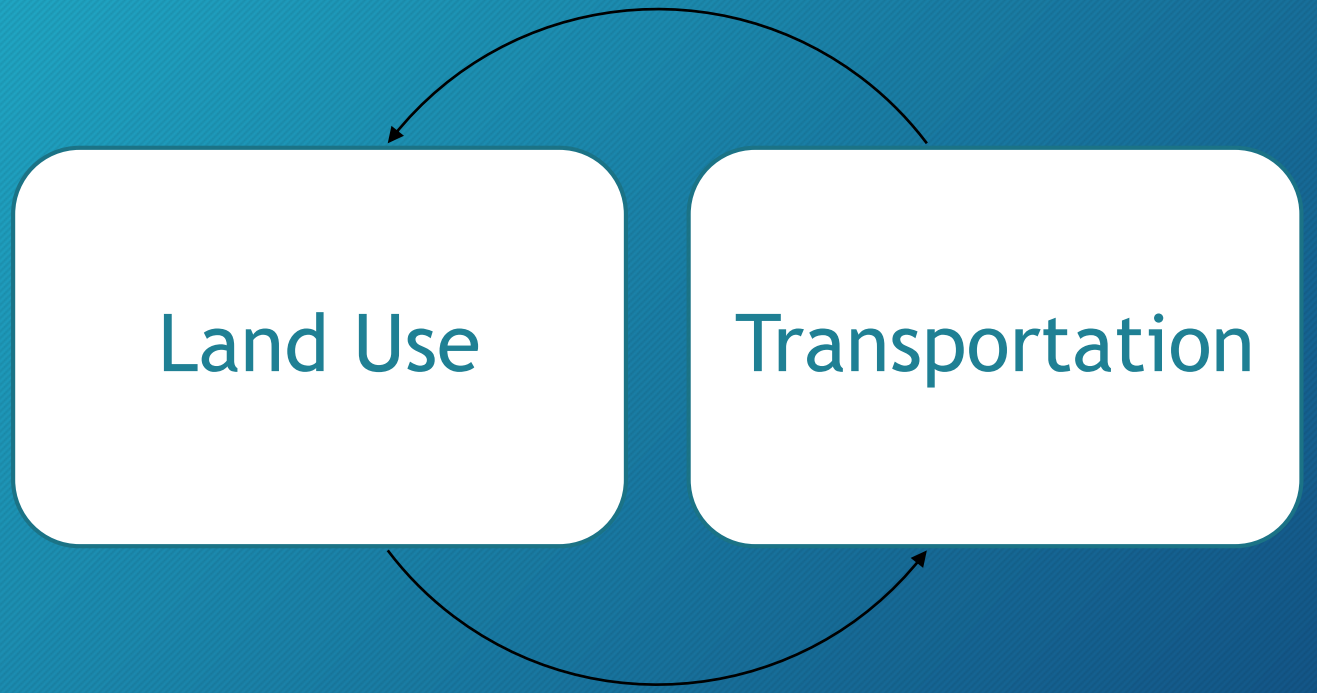
Energy and Buildings



Land Use and Access

Resource Management

Community and Health



Low density
Separated land uses

Increased car travel and need for vehicle and parking

Compact development
Integrated land uses

Decreased car travel, increase in walking, cycling, transit use

Key take-aways

Support actions that give people more options to:

- travel shorter distances
- travel more sustainably

Land Use Actions

Densification and Transit Oriented Development (LUA-2, LUA-4, LUA-21)

- LUA-2: Create a program that provides incentives to employees and residents who choose to live within two miles of their job
- LUA-4: Maximize incentives for mixed use and transit-oriented development
- LUA-21: Evaluate public infrastructure to prepare for redevelopment readiness and densification in the downtown and major corridors

Reimagine Washtenaw (LUA-1 and LUA-3)

- LUA-1: Actively support regional approaches to land use planning to reduce origin and destination distances
- LUA-3: Encourage coordinated zoning and redevelopment at higher densities, using land use, development regulations, and market forces

Capital Improvement Plan Scoring (LUA-20)

- LUA-20: Evaluate project life cycle and upstream CO2e emissions as criteria for City's Capital Improvements Plan scoring prioritization system

Greenbelt (LUA-5)

- LUA-5: Support future funding for greenbelt land purchases around Ann Arbor

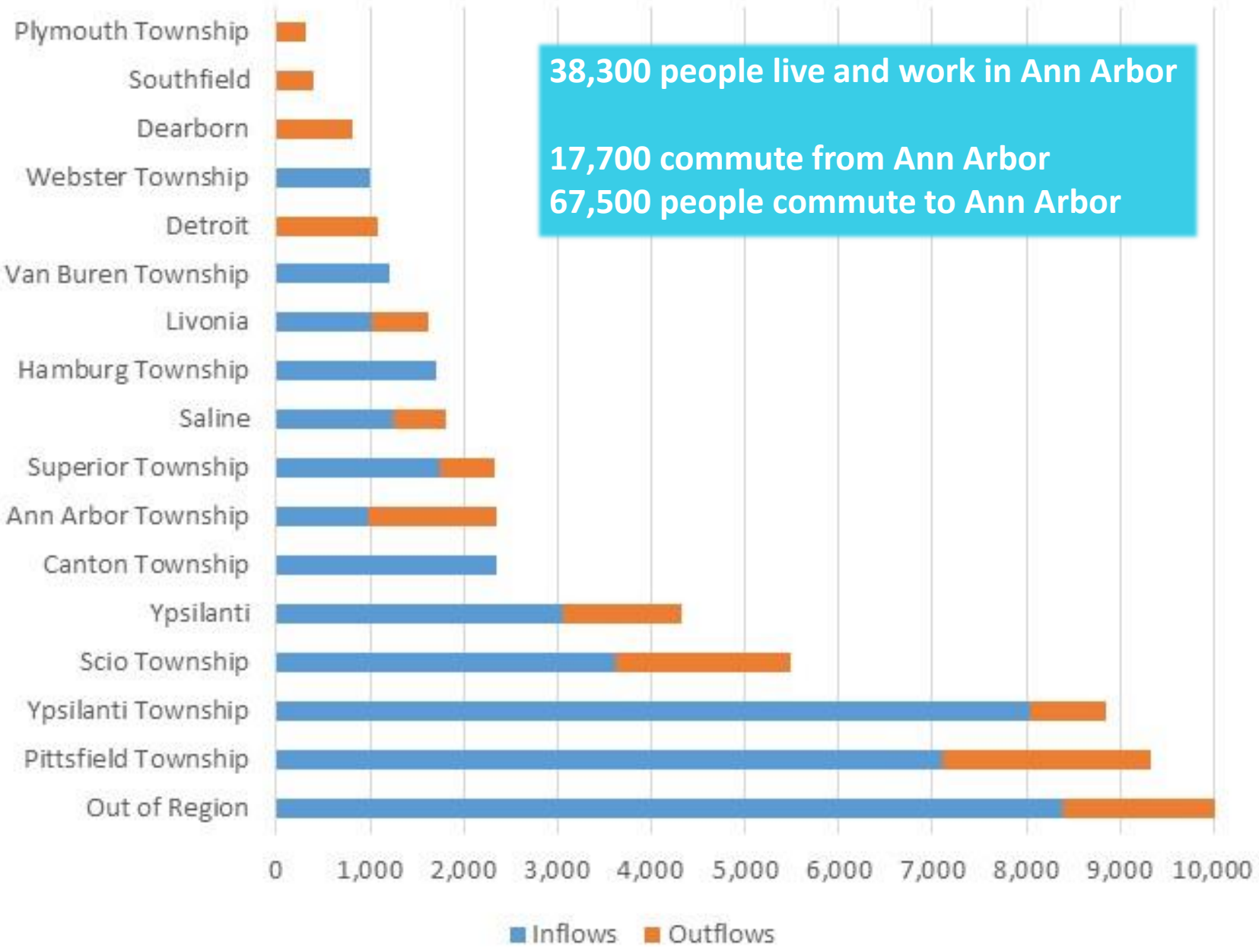
Transportation Actions

Commuting by Mode

	City of Ann Arbor	Ann Arbor Region	Michigan	United States
Drove Alone	64%	72%	83%	76%
Walked	13%	7%	2%	3%
Bus	10%	5%	1%	5%
Worked at Home	7%	5%	4%	4%
Carpooled	7%	8%	9%	10%
Bicycle	6%	2%	0.5%	0.6%

2013 5 and 1 year American Community Survey, US Census

Ann Arbor Regional Commuting Patterns



38,300 people live and work in Ann Arbor

17,700 commute from Ann Arbor
67,500 people commute to Ann Arbor

http://maps.semcog.org/CommutingPatterns

Smart Parking (LUA-6 and LUA-13)

- LUA-6: Revise the local Parking Ordinance to allow for flexibility with parking provisions
- LUA-13: Encourage market-based and incentive-based parking strategies and rates

SMART PARKING

Encouraging Bicycling and Walking (LUA-8, LUA-17, LUA-19)

- LUA-8: Implement a community-university bike sharing program
- LUA-17: Ensure that sidewalk, bike, and transit service exist within ¼ mile of every Ann Arbor household
- LUA-19: Make all possible signal and intersection pedestrian improvements

Encouraging Better Transportation Choices (LUA-7, LUA-11, LUA-14, LUA-15, LUA-16)

- LUA-7: Create a Travel Demand Management program that use social and targeted marketing to encourage more residents to walk, bike, and bus to their destinations
- LUA-11: Create a citywide go!pass program that combines bus use incentives with biking and walking incentives
- LUA-15: Encourage business and building owners to reduce in-bound vehicle traffic
- LUA-16: Increase events and activities that raise awareness of commuting benefits

Better Transit (LUA-9, LUA-10, LUA-12)

LUA-9: Actively engage and support the study and delivery of commuter rail along high demand corridors

LUA-10: Provide incentives for use of public transit

LUA-12: Enhance transit service, including more weekend and evening service

Promoting Electric Vehicles (LUA-18)

LUA-18: Establish requirements or guidance for electric vehicle and hydrogen-fueled vehicle parking infrastructure for projects and increase city-wide infrastructure for electric vehicle charging and hydrogen refueling

Challenges for A2 Climate Efforts

- GHG levels rising
- GHGs are cumulative
- Few current programs

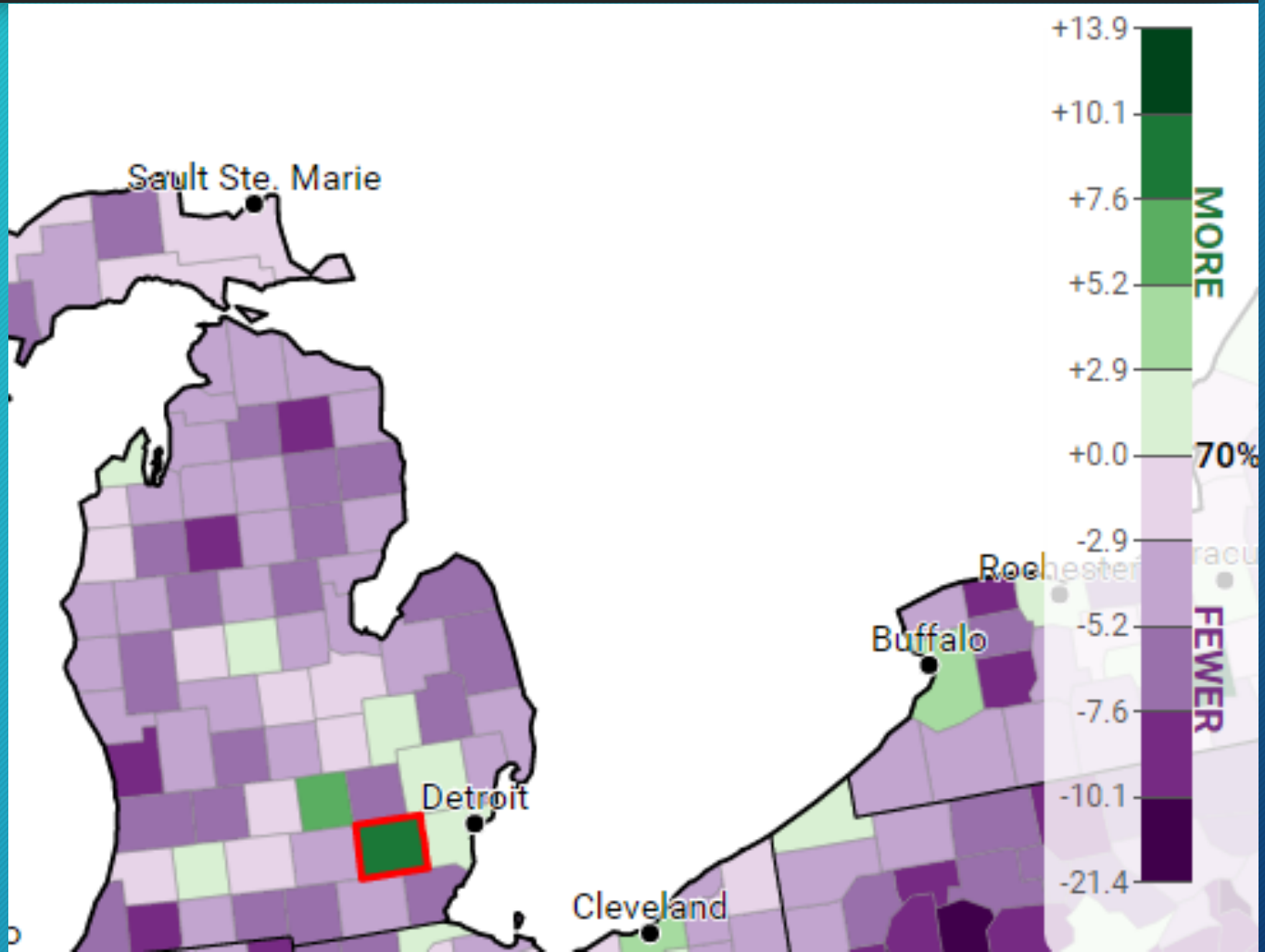
Ann Arbor Can Lead on Climate

Ann Arbor ranked #1 in country for clean energy innovation density

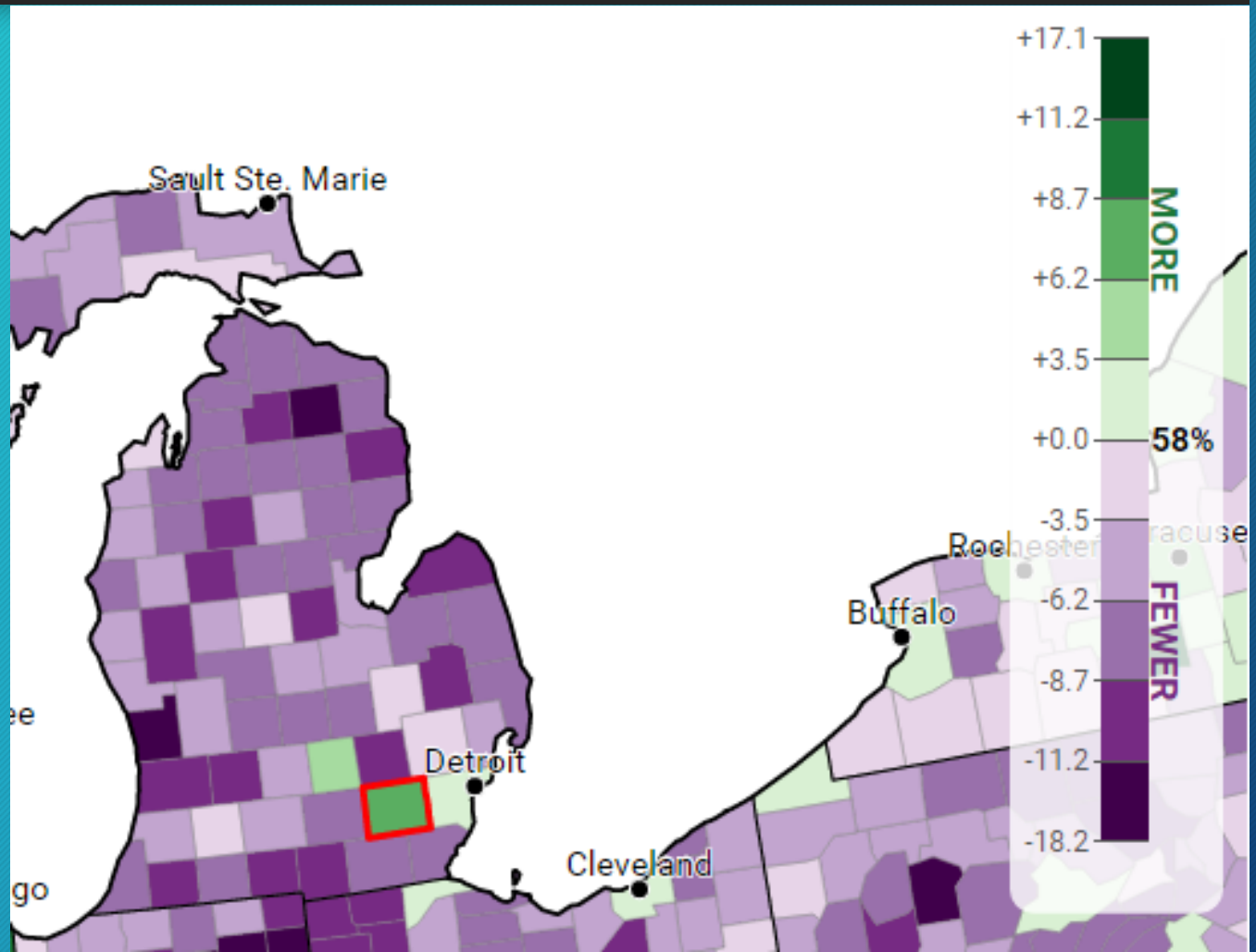
By KATHLEEN DAVIS • 20 HOURS AGO

Tweet Share Google+ Email

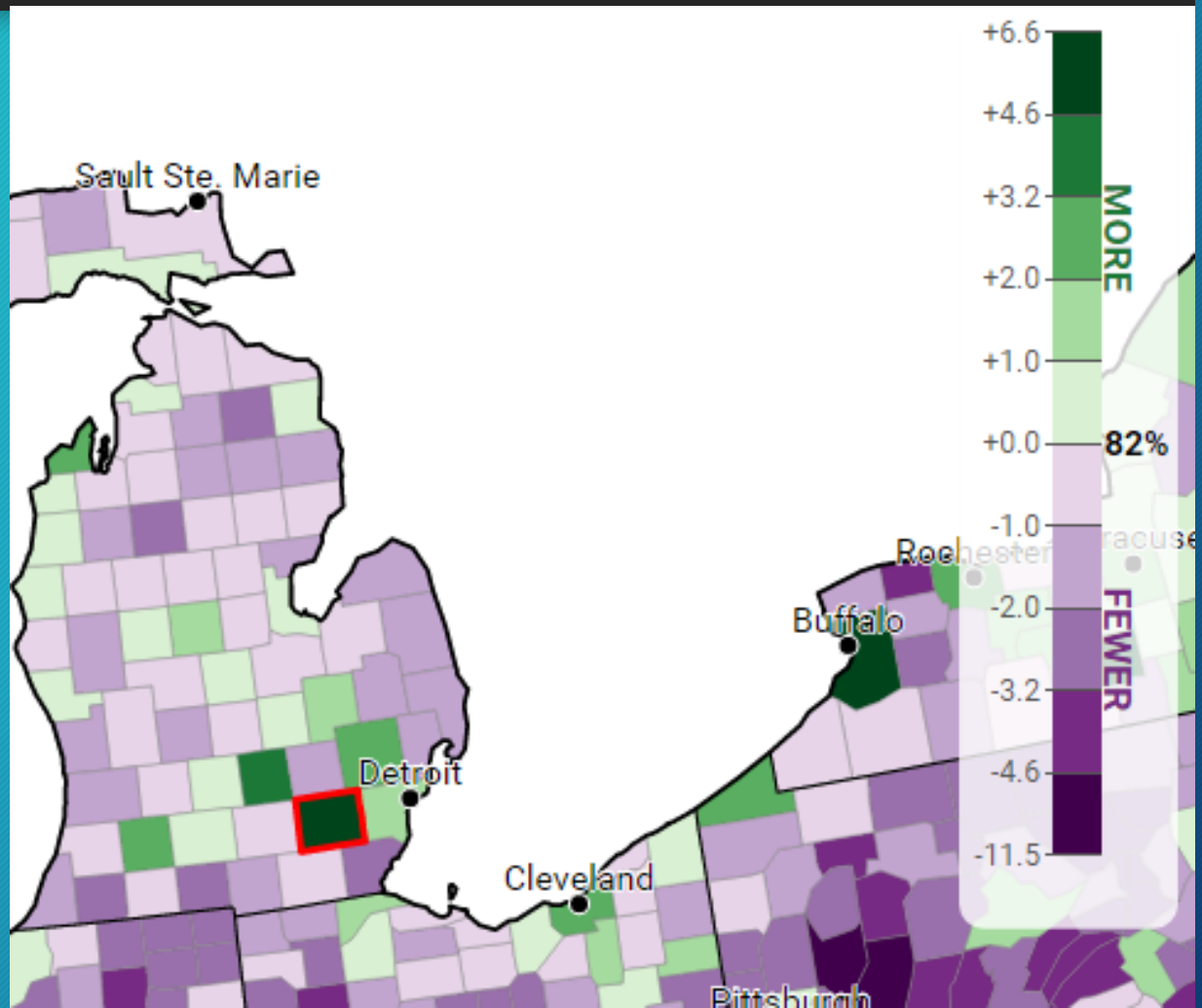
Adults who think global warming is happening



Adults who are worried about global warming



Adults who support funding renewable energy research



Questions?

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	Action ID	Land Use and Access Actions	Annual $MTCO_2e$ Reduced	$/$tCO_2e$	Impact
 Integrated Land Use	LU-1	Actively support regional approaches to land use planning to reduce origin and destination distances	Not Estimated	Not Estimated	**
	LU-2	Create a program that provides incentives to employees and residents who choose to live within two miles of their job	Not Estimated	Not Estimated	*
	LU-3	Encourage coordinated zoning and redevelopment at higher densities, using land use, development regulations, and market forces	Not Estimated	Not Estimated	**
	LU-4	Maximize incentives for mixed use and transit-oriented development	3,352	-$372	*
	LU-5	Support future funding for greenbelt land purchases around Ann Arbor	Not Estimated	Not Estimated	**
	LU-6	Revise the local Parking Ordinance to allow for flexibility with parking provisions	Not Estimated	Not Estimated	***
 Transportation Options	LU-7	Create a Travel Demand Management program that uses social and targeted marketing to encourage more residents to walk, bike, and bus to their destinations	9,962	-$335	**
	LU-8	Implement a community-University bikesharing program	143	$249	*
	LU-9	Actively engage and support the study and delivery of commuter rail along high demand corridors	1,077	$2,798	*
	LU-10	Provide incentives for use of public transit	Not Estimated	Not Estimated	*
	LU-11	Create a citywide go!pass program that combines bus use incentives with biking and walking incentives	621	Not Estimated	*
	LU-12	Enhance transit service, including more weekend and evening service	125	Not Estimated	*

	Action ID	Land Use and Access Actions Continued	Annual $MTCO_2e$ Reduced	$/$tCO_2e$	Impact
 Transportation Options	LU-13	Encourage market-based and incentive-based parking strategies and rates	13,350	Not Estimated	**
	LU-14	Create an innovative ride-sharing system	8,253	$4,615	**
	LU-15	Encourage business and building owners to reduce in-bound vehicle traffic	Not Estimated	Not Estimated	*
	LU-16	Increase events and activities that raise awareness of commuting benefits	847	$99	*
 Sustainable Systems	LU-17	Ensure that sidewalk/bike/transit service exist within ¼ mile of every Ann Arbor household	4,752	$550	*
	LU-18	Establish requirements or guidance for electric vehicle and hydrogen-fueled vehicle parking infrastructure for projects and increase city-wide infrastructure for electric vehicle charging and hydrogen refueling	1,602	-$294	*
	LU-19	Make all possible signal and intersection pedestrian improvements	18	Not Estimated	*
	LU-20	Evaluate project life cycle and upstream CO_2e emissions as criteria for City's Capital Improvements Plan scoring prioritization system	Not Estimated	Not Estimated	*
	LU-21	Evaluate public infrastructure to prepare for redevelopment readiness and densification in the downtown and major corridors	Not Estimated	Not Estimated	**