

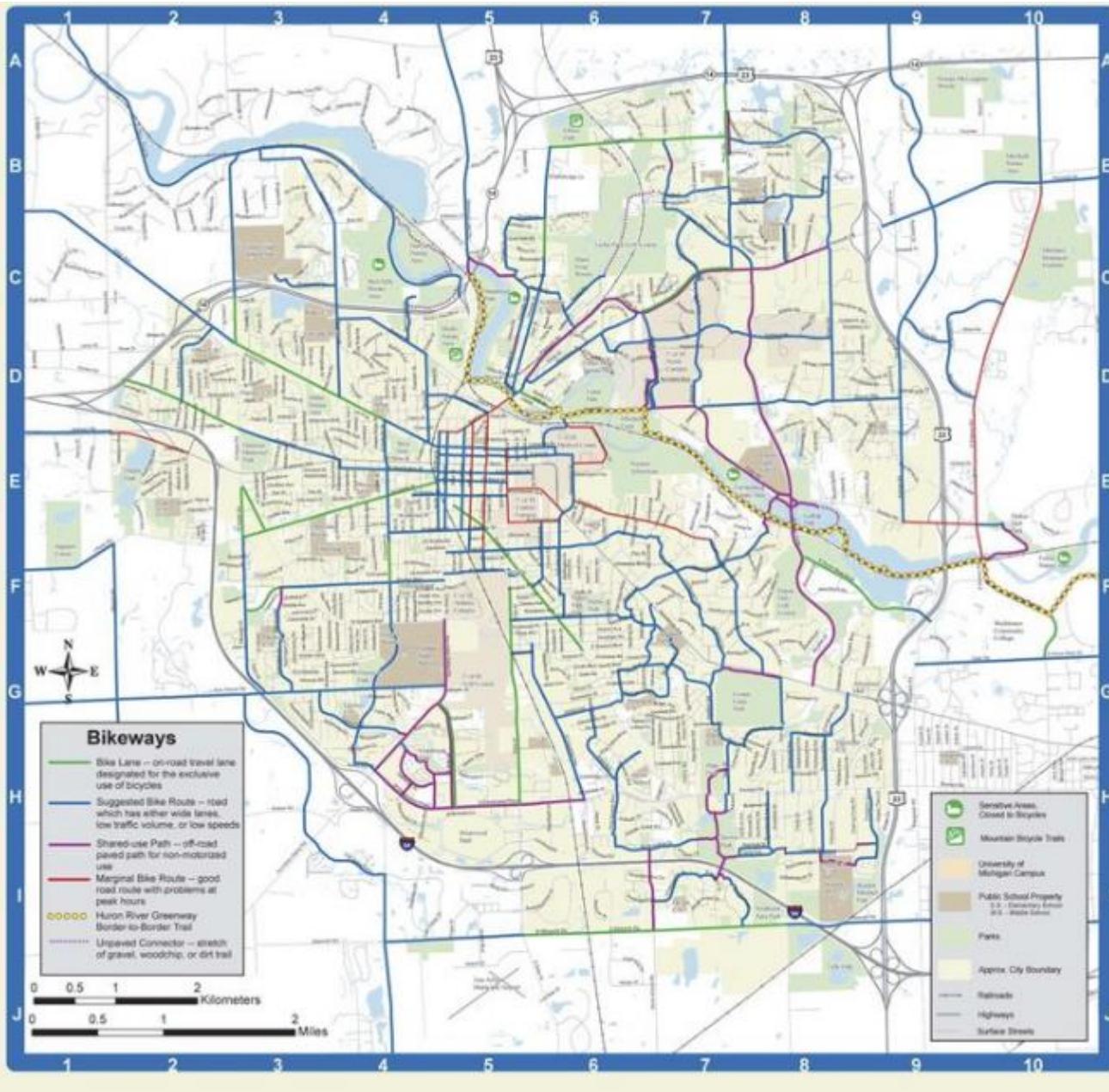


Sustainability & Climate Action

City of Ann Arbor

May 13, 2019

City Council Work Session



AGENDA

A) State of the Science

B) Where We've Been

C) Where We Are Going

D) Questions, Thoughts, Ideas





State of the Science

Dr. Jonathan Overpeck ('Peck')



Why Does this Matter?





“Without substantial and sustained global mitigation and regional adaptation efforts, climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century.”

~2018 National Climate Assessment





Infrastructure

Michigan is projected to have 2^d highest infrastructure costs



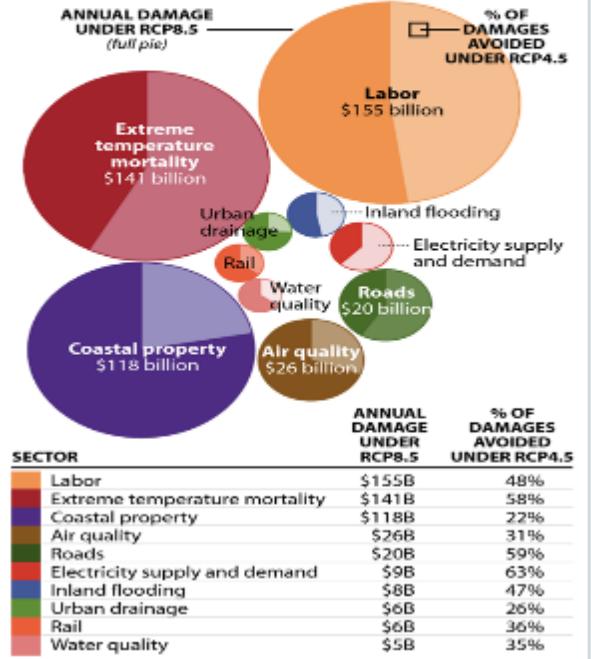
Health

Natural disasters and climate change have significant physical, emotional, and mental health impacts

FROM THE 2018 NATIONAL CLIMATE ASSESSMENT

Climate Change's Economic Impact

The National Climate Assessment warns that the costs of global warming are rising. If greenhouse gas emissions continue at a high rate (RCP 8.5), damage from climate change is expected to cost the U.S. economy hundreds of billions of dollars every year by 2090. If emissions peak before mid-century and start down (RCP 4.5), the U.S. economy will still suffer, but the cost will be less. The chart shows some of the top economic expenses.



Economy

\$141 billion from heat-related deaths, \$118 billion from sea level rise and \$32 billion from infrastructure damage by the end of the century, among others



CLIMATE CHANGE & PEOPLE



“Climate change creates new risks and exacerbates existing vulnerabilities in communities across the United States, presenting growing challenges to human health and safety, quality of life, and the rate of economic growth.”

~2018 National Climate Assessment



CLIMATE CHANGE IN ANN ARBOR



Rising Temperatures:

Average air temperature in A2 has increased by nearly 1°F since the 1900s and is expected to rise 3°F to 7°F by 2050.



Hot Days:

Ann Arbor is likely to experience 12 to 36 more days per year over 90°F by mid-century and 30 to 42 more days per year over 90°F by end of-century.



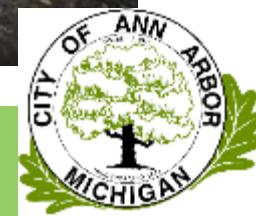
More Precipitation:

Total annual precipitation has increased by over 44% since the 1950s and will likely continue to increase in the future, though types of precipitation will vary (i.e., more winter precipitation in the form of rain or ice).



More Extreme Precipitation:

The total volume of rain falling during extreme events has increased by 37% since 1981 and the number of heavy rainfall events has increased by over 41% since the 1950s. These trends are both projected to continue increasing.



Racial inequity in Washtenaw County

TWO FUTURES ONE COMMUNITY

Washtenaw County #1 county in Michigan for health factors



Washtenaw County ranked 80/83 for income inequality



Racial gap of more than 30-40 points in student test scores



Ann Arbor 8th most economically segregated city



Washtenaw County #1 most expensive rental market in Michigan



Bottom 8% for upward income mobility

Ann Arbor - #1 Most educated city in America

#6 Cities that are secretly great for tech grads

#3 hottest market housing market in the country

#5 green cities for families & #1 city for millennials

- 60% of African-Americans live in low opportunity areas
- 9 yr. difference in life expectancy between 48104 and 49198
- Compared to white children:
 - Black babies are twice as likely to be born at a low birth weight and six times more likely to grow up in poverty
 - Latino children are 3 times more likely to grow up in poverty





“Climate change affects the natural, built, and social systems we rely on individually and through their connections to one another.

These interconnected systems are increasingly vulnerable to cascading impacts that are often difficult to predict, threatening essential services within and beyond the Nation’s borders.”

~2018 National Climate Assessment



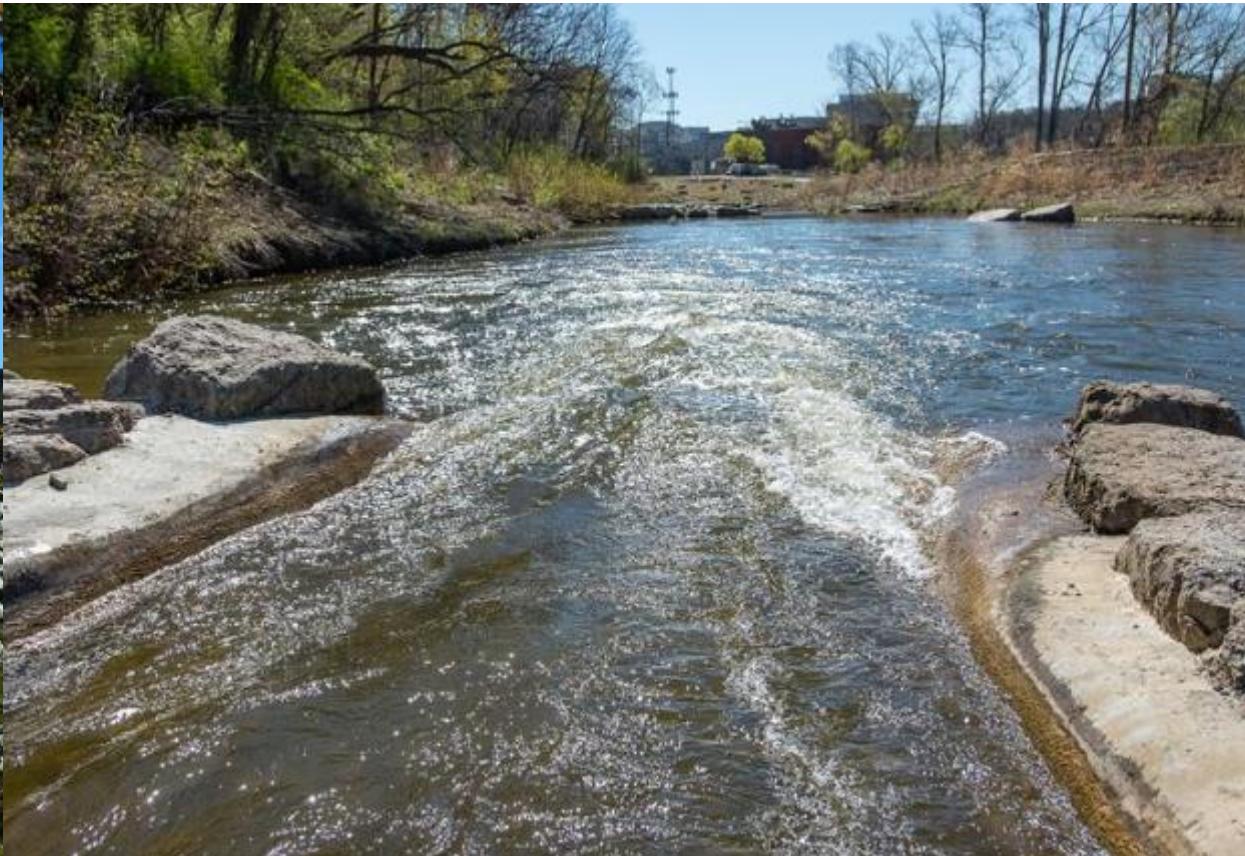
Dickinson, Texas

August 27, 2017



Residents of this nursing home were trapped in flood waters for hours before being rescued.

Cascading Impacts





LOOKS LIKE WE'RE ALL
MOVING TO MICHIGAN





15 years old



Where We've Been



Ann Arbor's Climate and Sustainability Timeline

1982	1994	1998	2001	2004	2007
<ul style="list-style-type: none"> • Tree City USA designation 	<ul style="list-style-type: none"> • Ann Arbor Energy Plan updated 	<ul style="list-style-type: none"> • Top 20 waste reduction programs in country • Municipal Energy Fund established 	<ul style="list-style-type: none"> • Environmental Commission founded 	<ul style="list-style-type: none"> • Green Fleets program initiated 	<ul style="list-style-type: none"> • Ann Arbor selected as a Solar America City • 5,000 Solar Roofs initiative (2006)
1981	1985	1997	1999	2003	2005
<ul style="list-style-type: none"> • Energy Advisory Board founded • Ann Arbor Energy Plan adopted 	<ul style="list-style-type: none"> • Energy Commission founded • Park rehab. & develop. 	<ul style="list-style-type: none"> • City joins ICLEI Cities Climate Protection 	<ul style="list-style-type: none"> • Clean Cities designation • Model Waste Reduction Program of N.A. 	<ul style="list-style-type: none"> • Greenbelt millage approved • Natural Features Master Plan 	<ul style="list-style-type: none"> • Mayor Hieftje issues Green Energy Challenge • City joins Conference of Mayors Climate Protection Agreement • City Council passes Energy Challenge Goals
2018			2016	2013	2011
<ul style="list-style-type: none"> • Green Fleets Policy updated • Office of Sustainability and Innovations formed • UM President Schlissel creates task force on carbon neutrality 			<ul style="list-style-type: none"> • Transportation Commission founded 	<ul style="list-style-type: none"> • Sustainability Framework adopted into City Master Plan 	<ul style="list-style-type: none"> • Gold level walk-friendly community
2017			2015		2012
<ul style="list-style-type: none"> • Ann Arbor joins the We Are Still In Campaign • City receives four star certification from STAR Community Index • Goal set for 100% renewable energy to power City operations 			<ul style="list-style-type: none"> • City achieves 18% GHG reduction based on 2000 levels • Mayor Taylor signs onto the Covenant of Mayors 		<ul style="list-style-type: none"> • Ann Arbor Climate Action Plan adopted
2025			2035		2050
<ul style="list-style-type: none"> • Goal of 25% reduction in community-wide greenhouse gas emissions 			<ul style="list-style-type: none"> • Goal for 100% clean and renewable energy for municipal operations 		<ul style="list-style-type: none"> • Goal of 90% reduction in community-wide greenhouse g
					



SINCE OSI FORMATION

- 01** Reinvigorated Green Fleets Team
- 02** City's first 3 electric vehicles purchased
- 03** Completed Solar Faithful Program
- 04** Monthly Sustainability Lunch and Learns
- 05** Solar Power Hours
- 06** Sustainability Forums
- 07** Revised City's Environmentally Preferable Purchasing Policy



PARTNERSHIP HIGHLIGHT



08

Partnership with Ann Arbor Housing Commission

1. Energy efficiency improvements
2. Electrification of appliances
3. Renewable energy installation
4. Battery ready



PARTNERSHIP HIGHLIGHT

09

Partnership with Ann Arbor Fire Department

1. Volunteer solar
2. Energy efficiency improvements
3. Environmentally preferable purchasing enhancements
4. Fire station master plan



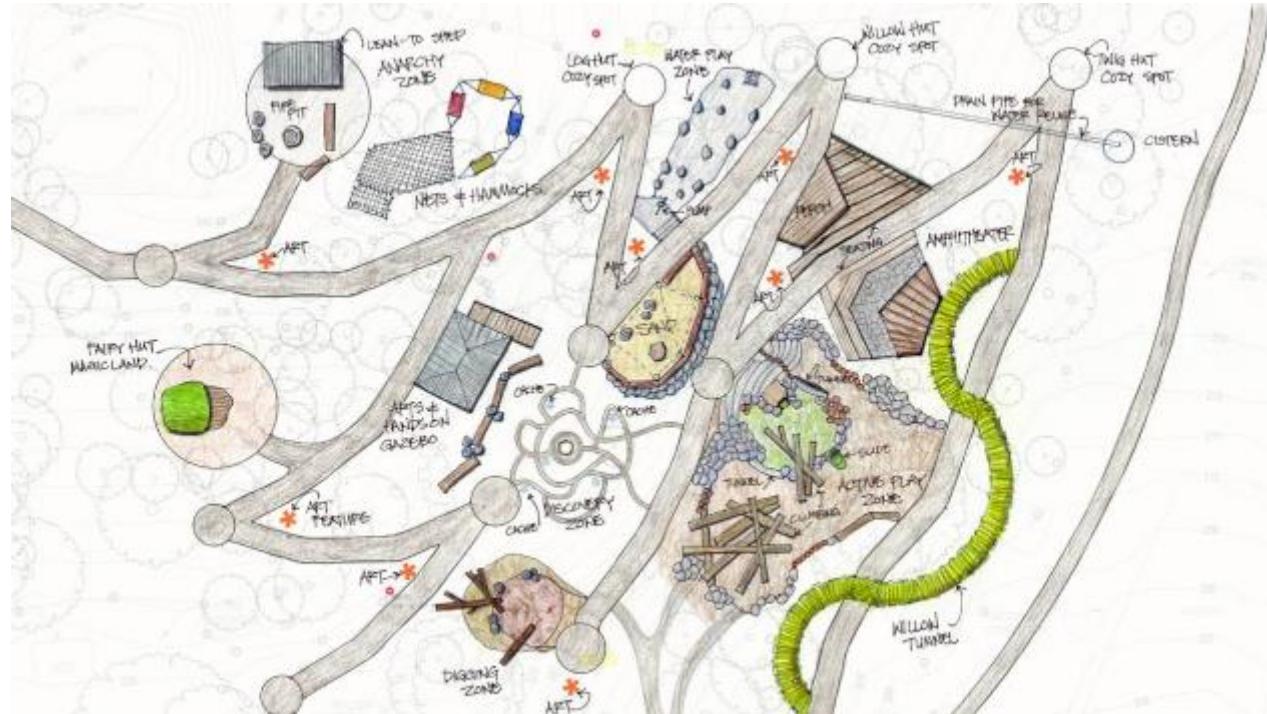
SINCE OSI FORMATION



- 10** Initiated electric vehicle readiness sub-committee
- 11** Initiated time of marketing (home energy disclosure) working group
- 12** Completed an equity scan of OSI's work plan and the City's Climate Action Plan
- 13** Organizing and hosting second round of equity training for staff
- 14** Working on visualization tool to integrate climate change and equity into all City decisions
- 15** Co-created work place Community Supported Agriculture (CSA) for staff
- 16** Awarded 8 Sustaining Ann Arbor Together (SA2T) grants



PROJECT HIGHLIGHTS



Sustaining Ann Arbor Together Grant Program

1. Solar education curriculum
2. Nature -Based playground x 2
3. Holistic environmental education
4. Youth job training
5. Repurposing old bicycles
6. Farmers Market
7. Community built play space





SINCE OSI FORMATION

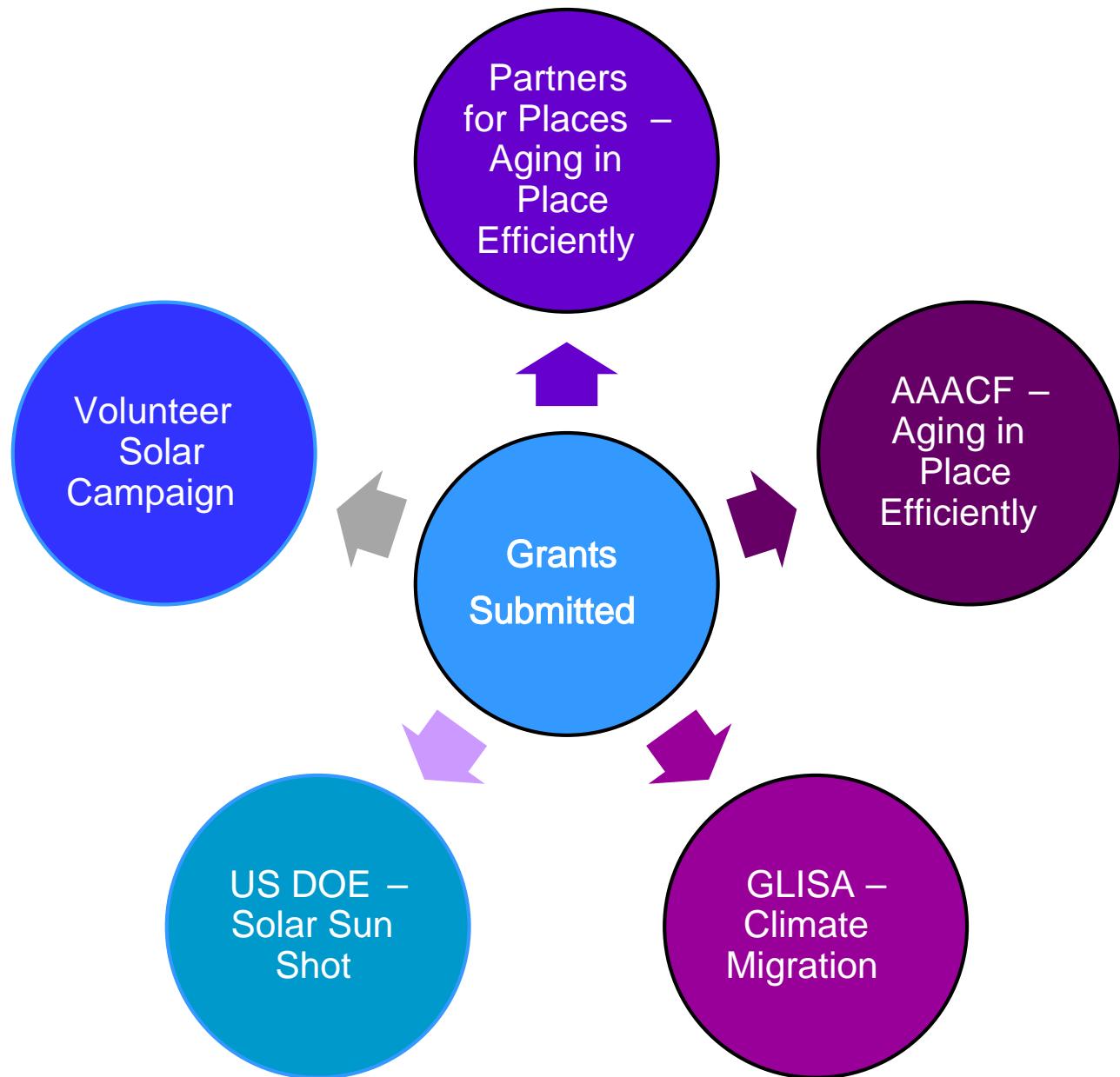
- 17** Filed interconnection paperwork for solar on 13 city facilities
- 18** Exploring feasibility of large-scale solar at the landfill
- 19** Initiated resilience hub outreach
- 20** Exploring expansion of landfill gas collection system
- 21** Launched solar installation and financing RFP
- 22** Launched energy efficiency identification RFP
- 23** Farm to Table dinner to celebrate 100th anniversary of the Farmers Market
- 24** Fundraising



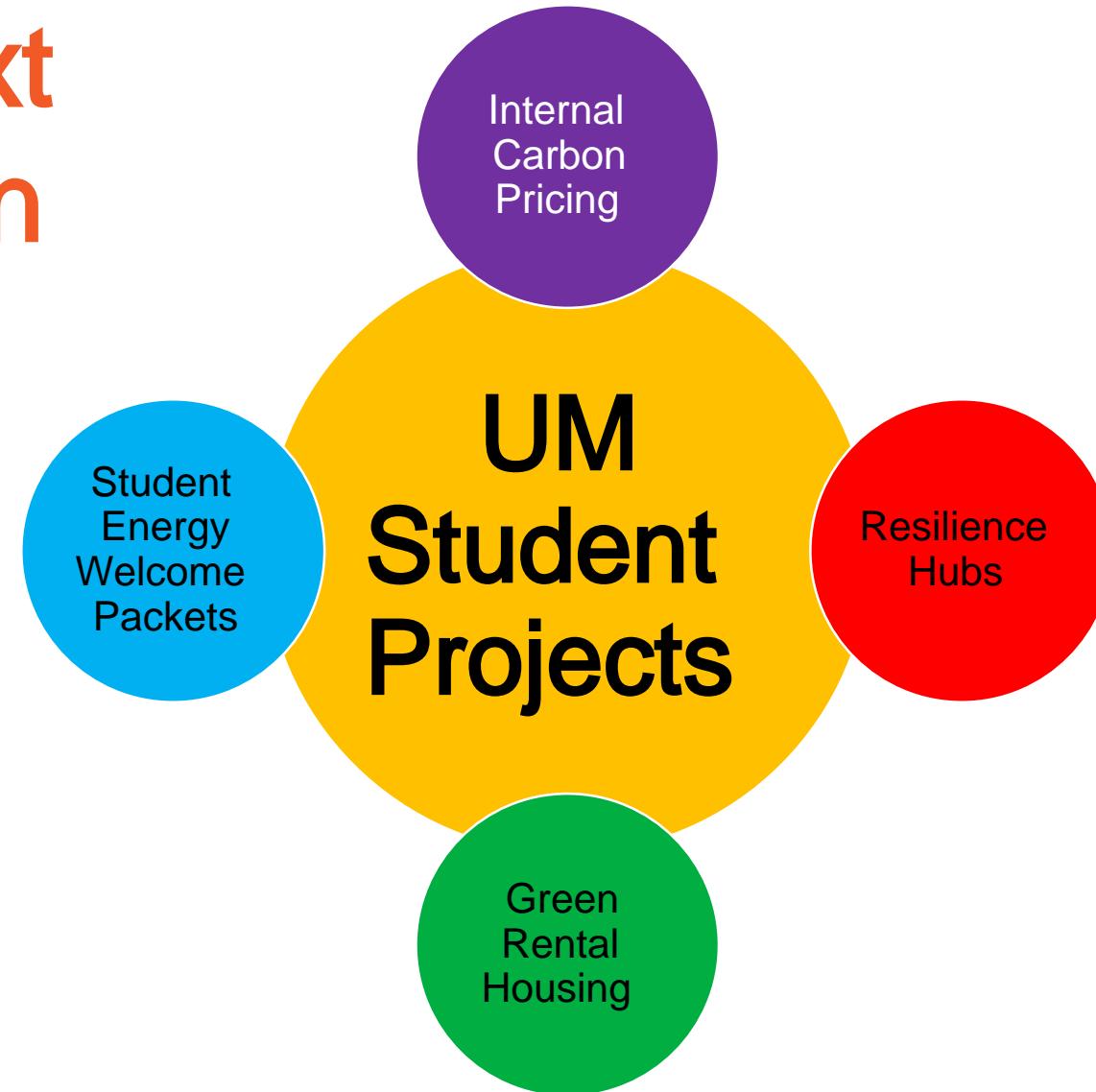
Fundraising



Fundraising



Engaging the Next Generation



Regional & National Level Service



- 25 Appointed to UM carbon neutrality commission
- 26 Appointed to County's Environmental Council
- 27 Appointed to national Sierra Club task force
- 28 Appointed President of the Board for the American Society of Adaptation Professionals
- 29 Appointed to Michigan Municipal League's Energy and Environmental Committee
- 30 Serving on American Society of Civil Engineers Sustainability Work Group



Where We Are Going



Ann Arbor's 5-Year Work Plan

Fiscal Year 2020 – Fiscal Year 2025

April 2019

Prepared by the Office of Sustainability and Innovations





Co-Benefits of
Sustainability
and Climate
Action

GOAL:
25% Reduction in
CommunityWide
Greenhouse Gas
Emissions



Office of Sustainability and Innovations Work Plan

- FY19-FY24

MATRIX KEY

Co-Benefits EDU - Education JOBS - Job Creation / Workforce Training NRG - Local Energy Production AIR - Air Pollution Reduction \$\$ - Dollars Stay In Local Economy ENV - Environmentally Friendly	EQU - Benefits the Most Vulnerable; Contributes to One Community Goals SOCO - Leads to Enhanced Social Cohesion COST - Cost Savings Accrued HEALTH - Improves Health of Residents RES - Improves the Resilience and/or Preparedness	Estimated annual savings may accrue to residents, business or the City	Impact Timeframe S - short (1-3 years) M - medium (4-8 years) L - 9+ years	Priority H - high M - medium L - low
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------	------------------------------------------------------

Work Plan Task	GHG Reduction Potential (metrics tons CO2e)	Cost Estimate (non-staffing)	Cost / Ton CO2e	Estimated Annual Savings	Payback Period	Co-Benefits	Impact Timeframe	Priority
----------------	---------------------------------------------	------------------------------	-----------------	--------------------------	----------------	-------------	------------------	----------

 RESIDENTIAL
Time of Marketing
Net Zero Energy Affordable Housing Program
Green Rental Program
Aging In Place Efficiently Program
Efficiency and Solar in the Community
Weatherization Expansion
Resilience Hubs
Rain Ready Community
Distributed Generation & Innovation Hubs
Local Carbon Offset Program

 COMMERCIAL
Grand Challenge Program
Solar Faithful
Green Business Program
Re-Energize UM Relationship

 TRANSPORTATION
EV Program

Office of Sustainability and Innovations Work Plan

- FY19-FY24

MATRIX KEY

Co-Benefits EDU - Education JOBS - Job Creation / Workforce Training NRG - Local Energy Production AIR - Air Pollution Reduction \$\$ - Dollars Stay In Local Economy ENV - Environmentally Friendly	EQU - Benefits the Most Vulnerable; Contributes to One Community Goals SOCO - Leads to Enhanced Social Cohesion COST - Cost Savings Accrued HEALTH - Improves Health of Residents RES - Improves the Resilience and/or Preparedness	Estimated annual savings may accrue to residents, business or the City	Impact Timeframe S - short (1-3 years) M - medium (4-8 years) L - 9+ years	Priority H - high M - medium L - low
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------	------------------------------------------------------

Work Plan Task	GHG Reduction Potential (metrics tons CO2e)	Cost Estimate (non-staffing)	Cost / Ton CO2e	Estimated Annual Savings	Payback Period	Co-Benefits	Impact Timeframe	Priority
MUNICIPAL								
100% Municipal Clean and Renewable Energy Strategy			\$300,000					
Revolving Energy Fund			\$200,000					
Assisting with Department Energy Purchasing			\$0					
Internal Communication Efforts	26,000		\$0					
Net Zero Buildings Policy			\$0					
Internalization of Sustainability into City Operations			\$0					
Michigan Municipal Association for Utility Issues	2,633		\$110,000	\$42	\$20,000-\$200,000	0-5 years		
CROSS-CUTTING, ENGAGEMENT, & EDUCATION								
Equity Programs / Planning	0	\$25,000	Not Estimated	Not estimated	Not estimated			
Commission Support	0	\$0	Not Estimated	Not estimated	Not estimated			
Sustaining Ann Arbor Together Neighborhood Grant Program	500	\$250,000	\$500	Not estimated	Not estimated	EDU; SOCO; \$\$; EQU; ENV		
Community Outreach	500	\$100,000	\$200	Not estimated	Not estimated	EDU; ENV		
Forming and Reforming Strategic Partnerships	500	\$25,000	\$50	Not estimated	Not estimated	EDU; SOCO		
National Field Building Efforts	500	\$75,000	\$150	Not estimated	Not estimated	EDU; COST; RI		

Work Plan Task	GHG Reduction Potential (metrics tons CO2e)	Cost Estimate (non-staffing)	Cost / Ton CO2e	Estimated Annual Savings	Payback Period	Co-Benefits	Impact Timeframe	Priority
TRACKING PROGRESS								
Greenhouse Gas Emissions Inventories	0	\$40,000	Not Estimated	Not estimated	Not estimated			
Metric Tracking	0	\$50,000	Not Estimated	Not estimated	Not estimated			





FY20 & FY21 Priorities

A
B
C
D
E
F
G
H
I
J

- Net zero energy affordable housing
- Sustaining Ann Arbor Together grant program
- 100% clean and renewable city operations
- Green Rental Housing program
- Home energy disclosure program
- Resilience hubs
- Green Business Challenge
- Aging in Place Efficiently
- Weatherization expansion
- Efficiency and solar in the community
- Ongoing community engagement



Net Zero Energy Affordable Housing

Use a combination of energy efficiency and solar systems to reduce energy consumption and GHG emissions of our affordable housing units.

Amount Requested : \$200,000

Partner : AAHC

Goals:

- All affordable housing complexes and units are energy positive or neutral by 2035
- Five net zero energy affordable housing sites by 2025
- 90% of residents have improved experiences
- 5-8% reduction in AAHC operating costs by 2035



Sustaining Ann Arbor Together

Promotes and supports community-based activities in support of the goals of the City's Sustainability Framework.

Amount Requested : \$100,000

Partner : Neighborhood associations; community members, schools, etc.

Goals:

- Ten grants submitted starting in FY20
- \$100,000 allocated starting in FY20



100% Clean and Renewable

Energy
efficiency
Renewable
Energy

Electrification
Revolving
Energy Fund
Batteries



Amount Requested : \$170,000 + \$100,000 for Revolving Energy Fund

Partner : All City departments, utilities

Goals:

- Complete energy audits for 10 city facilities in FY20
- Install energy improvements in at least 5 of these facilities by FY21
- Solar on 5 city facilities by FY21



Green Rental Housing

Program and associated policy requiring rental property owners to meet a minimum efficiency standard before receiving their rental licenses.

Amount Requested : \$25,000

Partner : Community services

Goals:

- Rental efficiency standard established by end of FY20
- Ordinance in place in FY22
- No net increase in rents, outside market rate changes, 3 years after ordinance effective date



Home Energy Disclosure

Require sellers of a single-family home to obtain and disclose the findings of a Home Energy Score. Will pair with education and access to rebates & retrofits.

Amount Requested : \$40,000

Partner : Energy & Planning Commissions

Goals:

- Ordinance created in FY20
- 1,000 homes disclose energy usage by 2021
- Residential GHG emissions have dropped by 2% by 2021



Resilience Hubs

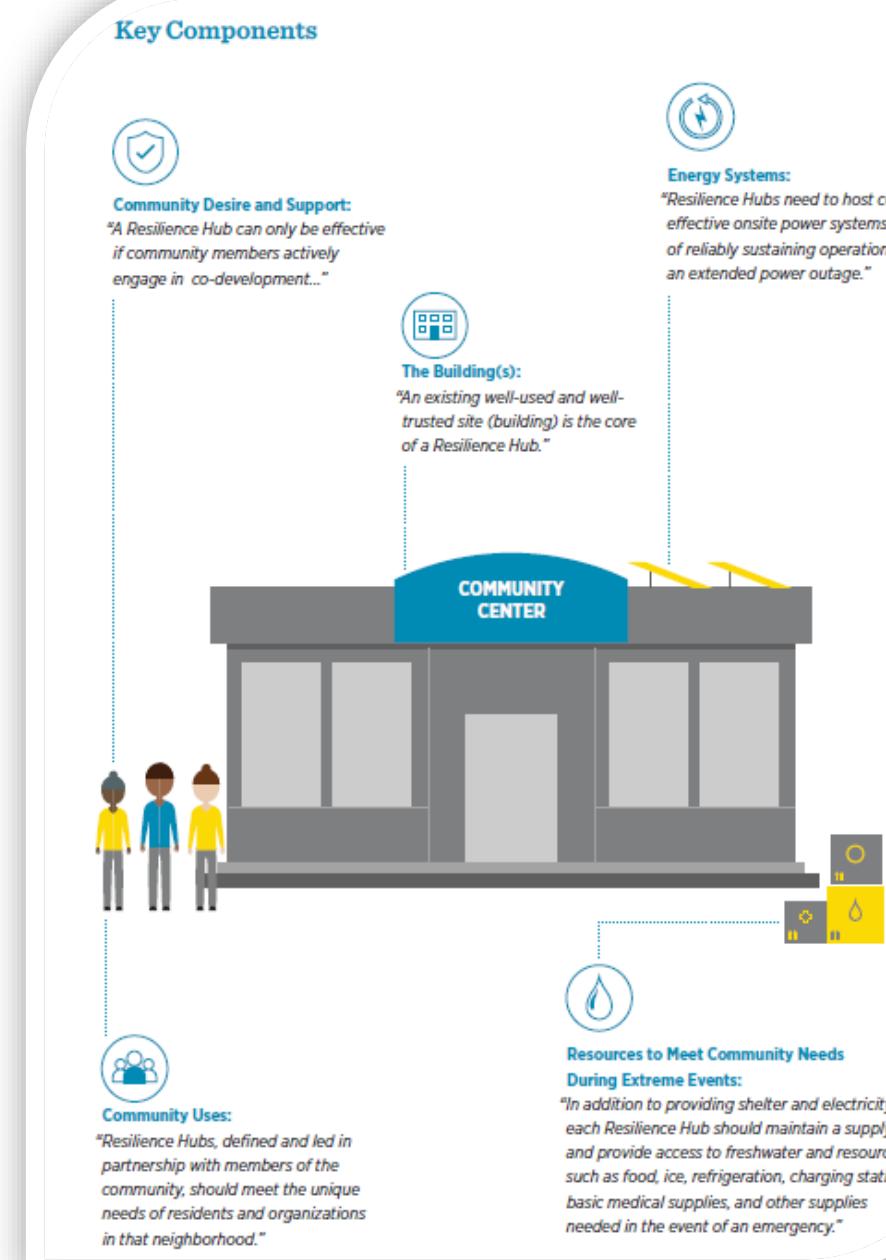
Neighborhood-based locations that support existing community needs while fostering year-round resilience.

Amount Requested : \$87,000

Partner : Community+

Goals:

- First resilience hub designed by end of FY20
- At least partial implementation of hub by FY21
- Second resilience hub under design by end of FY21
- 200 additional residents have emergency preparedness kits by end of FY21



Green Business Challenge

Encourages, assists, and recognizes our businesses for engaging in more sustainable behaviors

Amount Requested : \$10,000

Partner : Businesses

Goals:

- By the end of FY21 a Green Business Challenge program has been designed in partnership with the community.
- Fifty (50) local businesses participate in the Challenge by 2025.
- Collectively , businesses participating in the Challenge have reduced their energy consumption, waste usage, plastic consumption, and toxic material usage by 10%.

GREEN BUSINESS CHALLENGE



AN ICLEI USA PROGRAM



Aging in Place Efficiently

Work with local partners to ensure that residents can age in place in energy efficient, and healthy residences.

Amount Requested : \$5,600

Partner : Aging organizations, energy experts, +

Goals:

- Number of seniors registered for program
- 15% reduction in energy usage in 21 low -income senior homes by 2021
- Sustainable funding source identified for the program



Weatherization Expansion

Expand weatherization services for low income homeowners, increasing the uptake of existing weatherization services and raising income limits to qualify more A2 homeowners for free to low-cost energy efficiency improvements.

Amount Requested : \$55,000

Partner : Washtenaw County

Goals:

- Creation of a weatherization expansion initiative for Ann Arbor residents
- 12 Ann Arbor homes weatherized through this expansion by the end of FY 2020



Weatherization Works



Efficiency and Solar in the Community

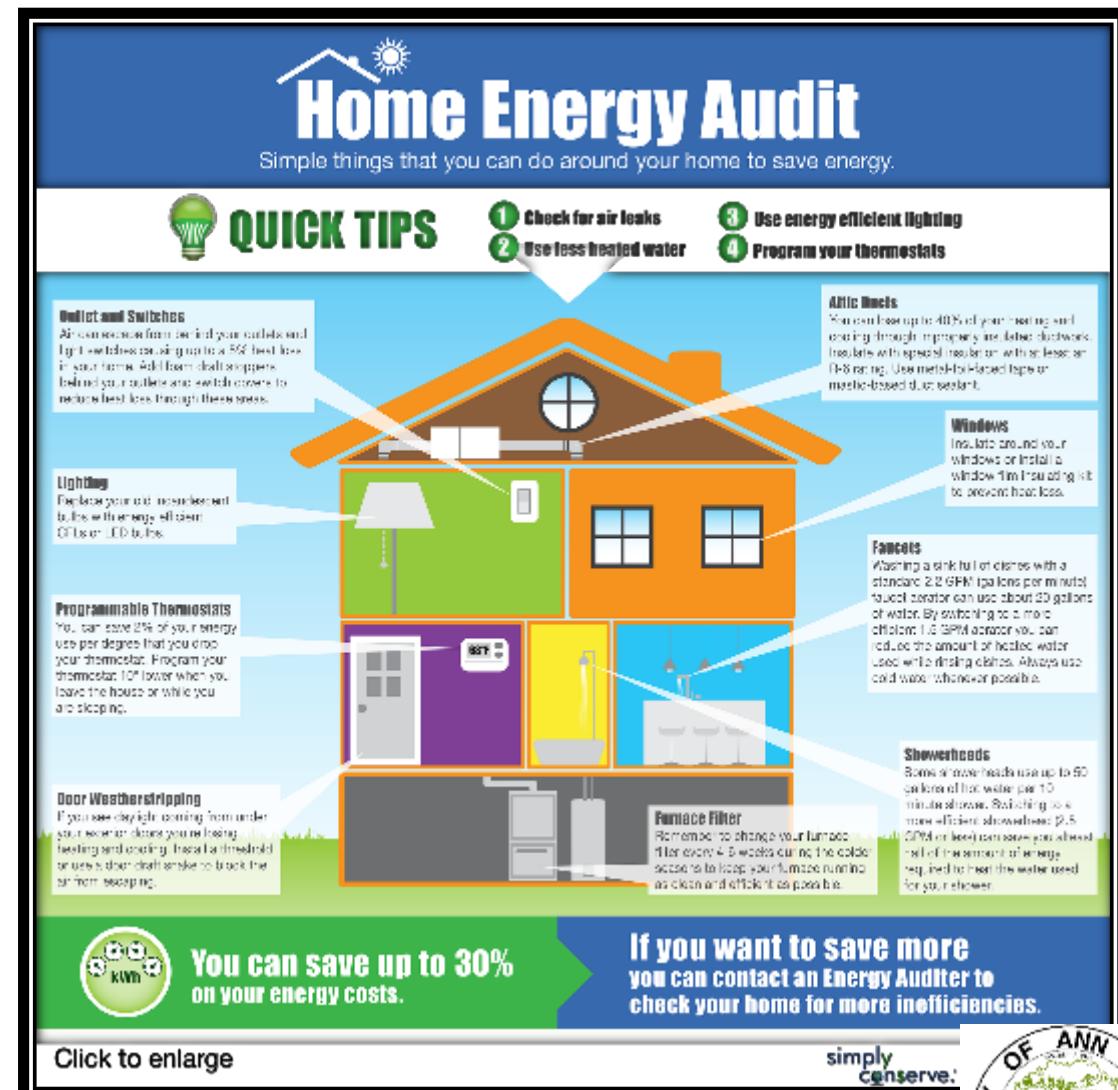
One program to stimulate energy efficiency and renewable energy installations in A2 community.

Amount Requested : \$47,096

Partner : Community

Goals:

- Reduced energy bills for Ann Arbor residents through energy efficiency improvements and targeted behavioral changes
- Reduced community -wide greenhouse gas emissions by 5% by 2025
- Run group buy programs that lead to at least 500 new electric vehicles within the community by 2025.



The infographic is titled "Home Energy Audit" with a subtitle "Simple things that you can do around your home to save energy." It features a central house diagram with various energy-saving tips labeled around it. At the top, there are four "QUICK TIPS": 1. Check for air leaks, 2. Use less heated water, 3. Use energy efficient lighting, and 4. Program your thermostats. The house diagram shows a sun on the roof, a lamp, a window, a door, a furnace, and a showerhead. Labels with tips include: "Wall and Switches" (check for air leaks), "Lighting" (use energy efficient lighting), "Programmable Thermostats" (save 2% on energy use per degree), "Door Weatherstripping" (keep air from leaking), "Faucets" (wash clothes with a standard 2.2 GPM), "Showerheads" (some use up to 50 gallons per minute), "Windows" (insulate around windows), "Attic Insulation" (reduce heating and cooling costs by 40%), and "Furnace Filter" (keep furnace running clean and efficient). A green arrow at the bottom left says "You can save up to 30% on your energy costs." A blue arrow at the bottom right says "If you want to save more you can contact an Energy Auditor to check your home for more inefficiencies." A "Click to enlarge" button is at the bottom left, and the "simply conserve." logo is at the bottom right.



Take A Ways



- Humanity is conducting an unprecedented experiment with the Earth's climate system.
- We have until 2030 to halve global GHG emissions if we want to avoid the most significant climate-related impacts.
- Choices made today will determine the magnitude of climate change risks for decades.
- We know what we need to do and have the skills in A2 to do it!



“Manage the unavoidable and avoid the unmanageable”

Dr . Missy Stults
Sustainability and Innovations Manager
City of Ann Arbor
mstults@a2gov.org

