City of Fitchburg
Sustainability Action Plan

Community Presentation and Input

January 30th, 2024

Agenda

Introduction

The Project

Planning Process

Climate Action Baselines

Ways to Get Involved

Q + A

Preliminary Draft Strategic Goals

(please add your thoughts!)

Introduction

making change personal
paleBLUEdot LLC

Our mission:

To hasten the transition to an authentically sustainable, no carbon economy and to elevate the public discourse.

Services:

- climate planning
- sustainability + resilience consulting
- renewable energy + net zero planning

Colleen

Educator
Community Engagement Consultant
Climate Planner

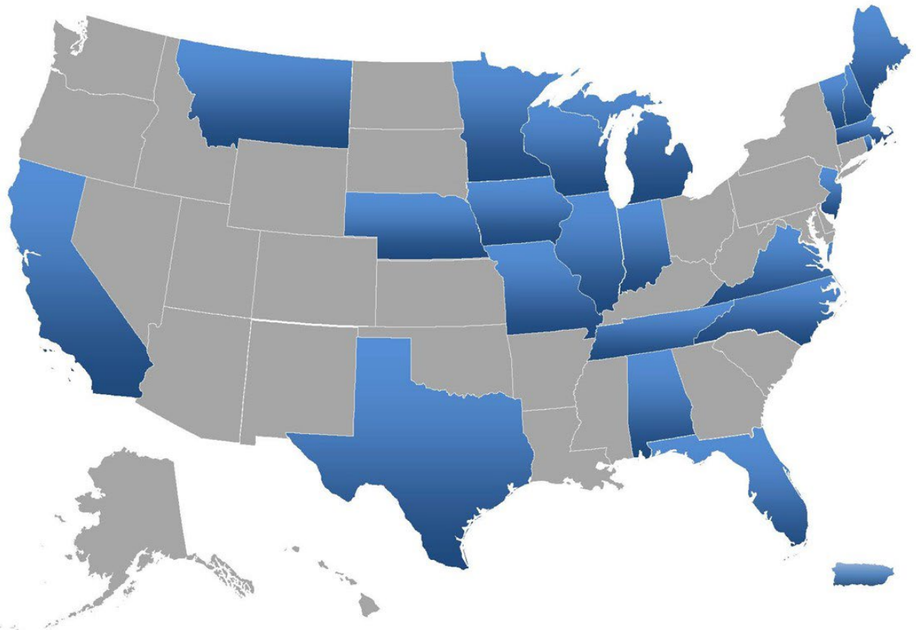
Ted

Architect
Urban Planner
Renewable Energy Consultant
Climate Planner

Introduction

70+ Projects in 22 states

Midwest: 55 Communities



Sustainability, Climate and Energy Planning experience in last 3 years (partial):

THE CITY OF Fitchburg WISCONSIN

THE CITY OF West Des Moines

LA CROSSE WISCONSIN

VILLAGE OF SKOKIE 1888 COOK COUNTY ILLINOIS

THE CITY OF DUBUQUE *Masterpiece on the Mississippi*

City Of Burnsville

CITY OF BLOOMINGTON

Maplewood MINNESOTA

Village of Northbrook

KANE COUNTY, ILLINOIS ESTABLISHED JANUARY 16, 1836

City Of Faribault

HENNEPIN COUNTY MINNESOTA

POLK COUNTY

Climate and Energy Planning Clients

(Since 2018)

Municipal Clients

Aekely, MN
Albert Lea, MN
Ames, IA
Bloomington, IN
Brainerd, MN
Brooklyn Park, MN
Burnsville, MN
Chattanooga, TN
Chrisholm, MN
Crookston, MN
Dallas, TX
Dubuque, IA
Duluth, MN
Eau Claire, WI
Edina, MN
Elk River, MN
Fairfax, MN
Faribault, MN
Granite Falls, MN
Hartford, VT
Kelliher, MN
La Crosse, WI
LaFarge, WI
Maplewood, MN
Marion, AL
Middlebury, VT
Morris, MN
Mountain Iron, MN
New Brighton, MN
Northbrook, IL
Northfield, MN
Oakdale, MN
Peterborough, NH
Ranier, MN
Roseville, MN
Saint Charles, MN
Sandy Springs, GA
Skokie, Il
St Louis Park, MN
Tuskegee, AL
Warren, MN
Winnebago, MN
Winthrop, MN
Wise, VA

County Clients

Addison County, VT
Hennepin County, MN
Kane County, Il
Ramsey County, MN
Becker County, MN
Clay County, MN
Douglas County, MN
Grant County, MN
Otter Tail County, MN
Polk County, IA
Pope County, MN
Stevens County, MN
Traverse County, MN
Wilkin County, MN

Tribal Nation Clients

Leech Lake Band of Ojibwe
Shakopee Mdewakanton Sioux Community
White Earth Nation

State Clients

State of Minnesota
State of Missouri
State of Montana

The Project

Why Are We Here:

The Project

Develop a **Sustainability Action Plan** (SAP) for the City of Fitchburg. The plan is intended to guide action **community-wide as well as municipal operations**.

The planning process will review and establish overall goals as well as establish strategies and actions to achieve the goals.

The Project

What Is a Sustainability Action Plan:

Sustainability plans are comprehensive roadmaps that outline the specific Strategies and Actions that a community will implement to increase overall community sustainability and resilience. Sustainability plans typically also include climate mitigation and adaptation as a consideration of resilience.

The Fitchburg plan is anticipated to address mitigation and adaptation:

Mitigation – reducing climate change – involves reducing the flow of heat-trapping greenhouse gases into the atmosphere (supporting goals of joint declaration).

Adaptation – developing ways to protect people and places by reducing their vulnerability to climate impacts (supporting guiding principals).

The Project

What Is a Sustainability Action Plan:

They address broad sustainability action sectors:

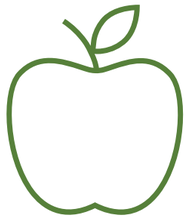
Buildings and Energy

Transportation and Land Use

Solid Waste and Recycling

Water, Wastewater and Flooding

Health and Safety



Local Food and Agriculture

Greenspace, Trees, and Ecosystems

Sustainable Economy

Mitigation
(and some adaptation)

Adaptation
(and some mitigation)

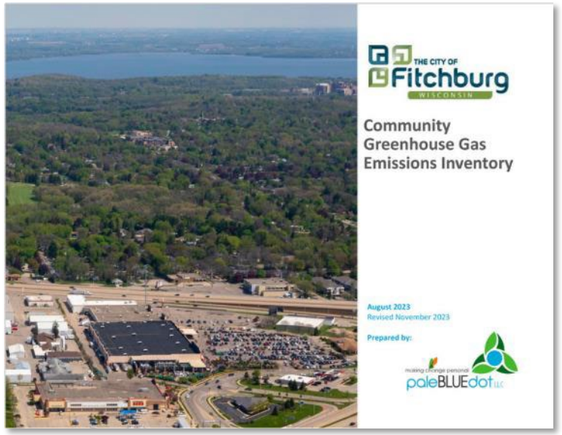
Planning Process

Planning Process

Sustainability Baseline Documents

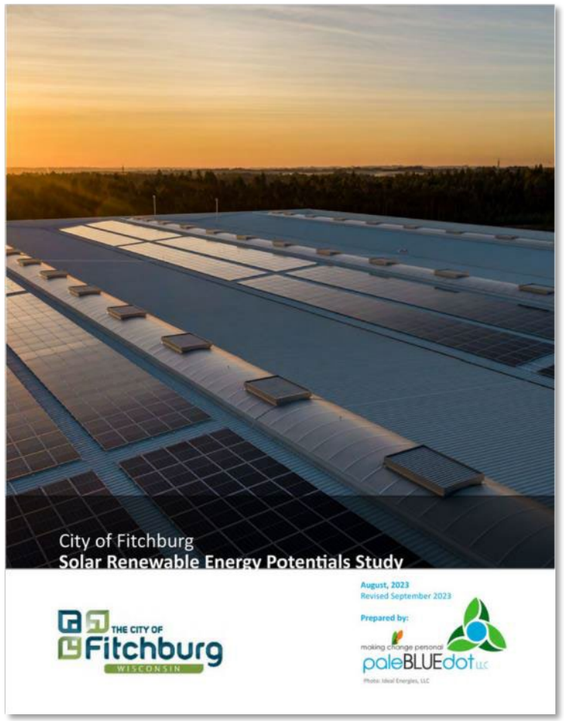
Vulnerability Assessment

GHG Inventory and Forecast



Ground Cover Survey

Renewable Energy Potential



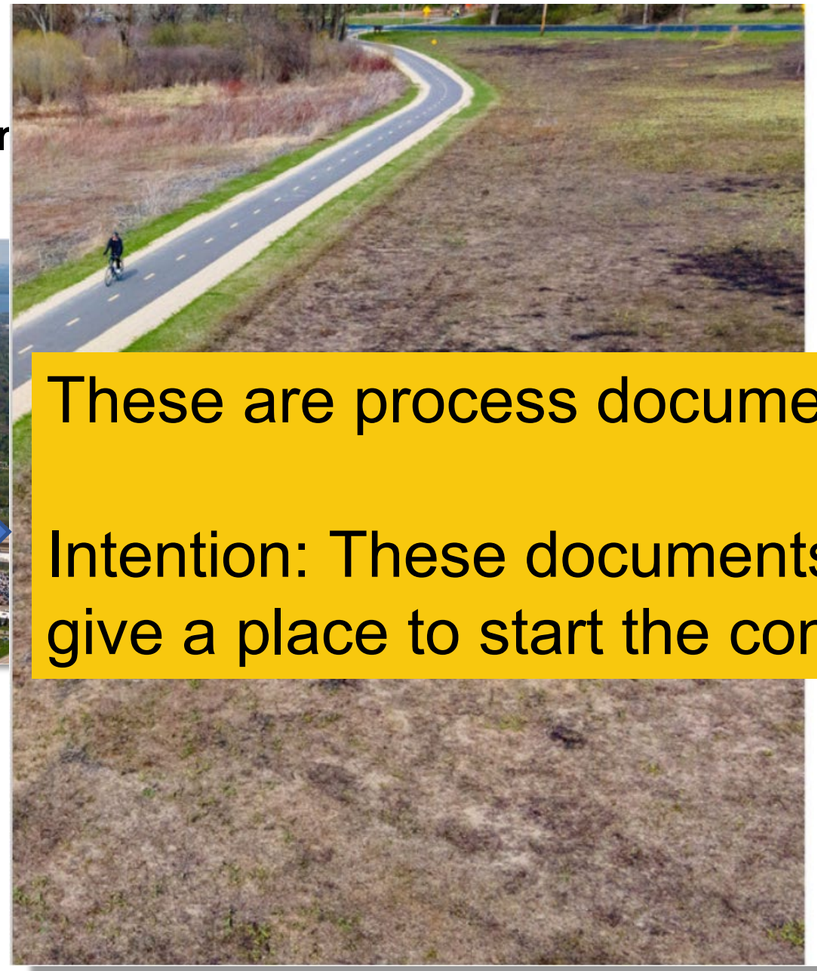
View these process https://palebluedot.llc/fitchburg-sustainability

Planning Process

Sustainability Baseline Documents

Vulnerability Assessment

GHG Inventor
Forecast



These are process documents.

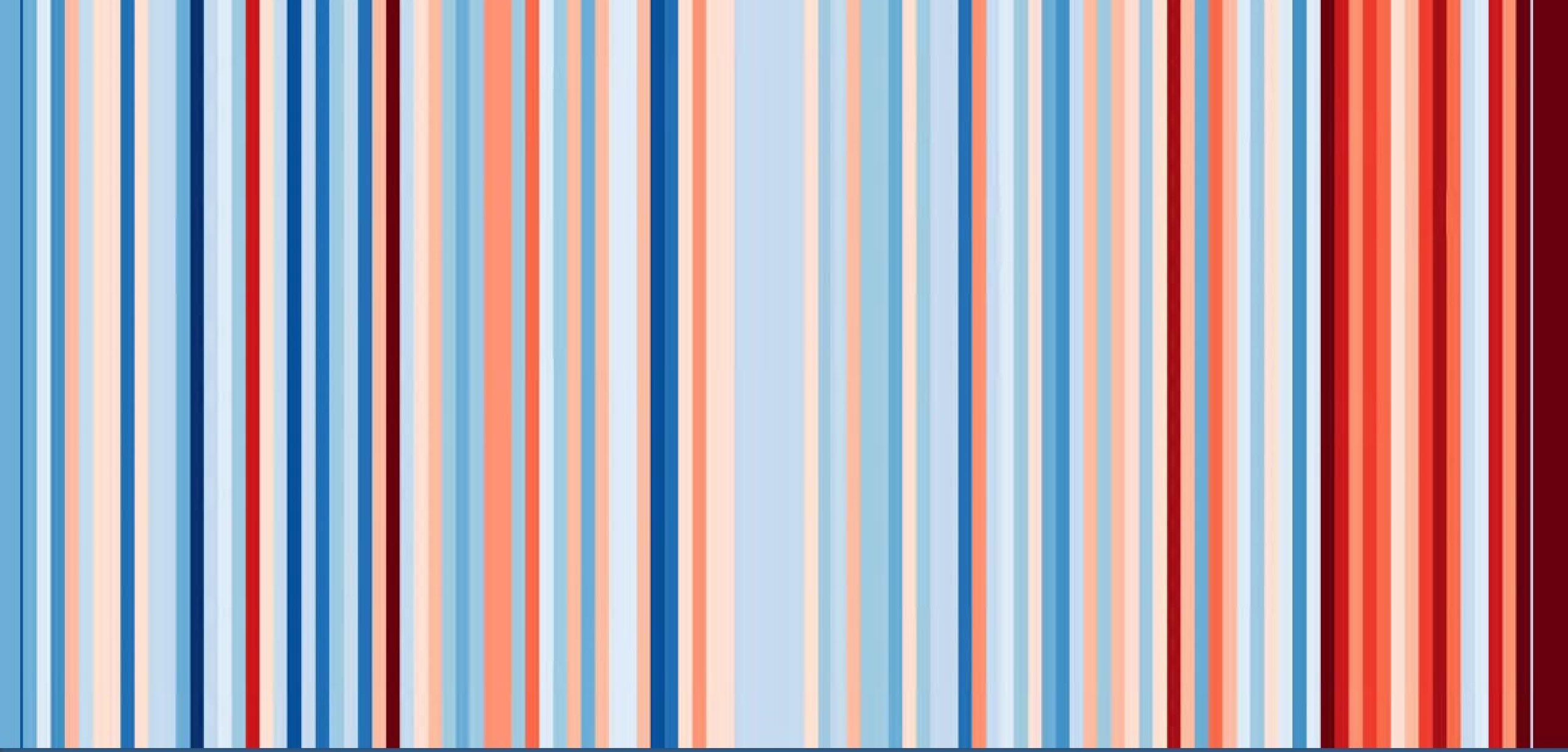
Intention: These documents seek to just give a place to start the conversation!

View these process https://palebluedot.llc/fitchburg-sustainability

Foundational Document Review

Sustainability Baseline Documents

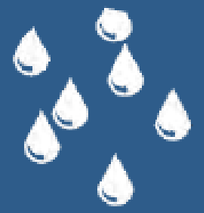
Vulnerability Assessment


1895
Wisconsin's Annual Temperature Trends
2021
Each stripe represents the temperature Wisconsin averaged over a year. Blue = Below Average Red = Above Average

The City's Future Climate

By 2050, without successfully reducing global GHG emissions, City of Fitchburg's climate can be expected to be:

+3-5°F
warmer average annual temperature than now.



+5% higher
Annual average rainfall than now

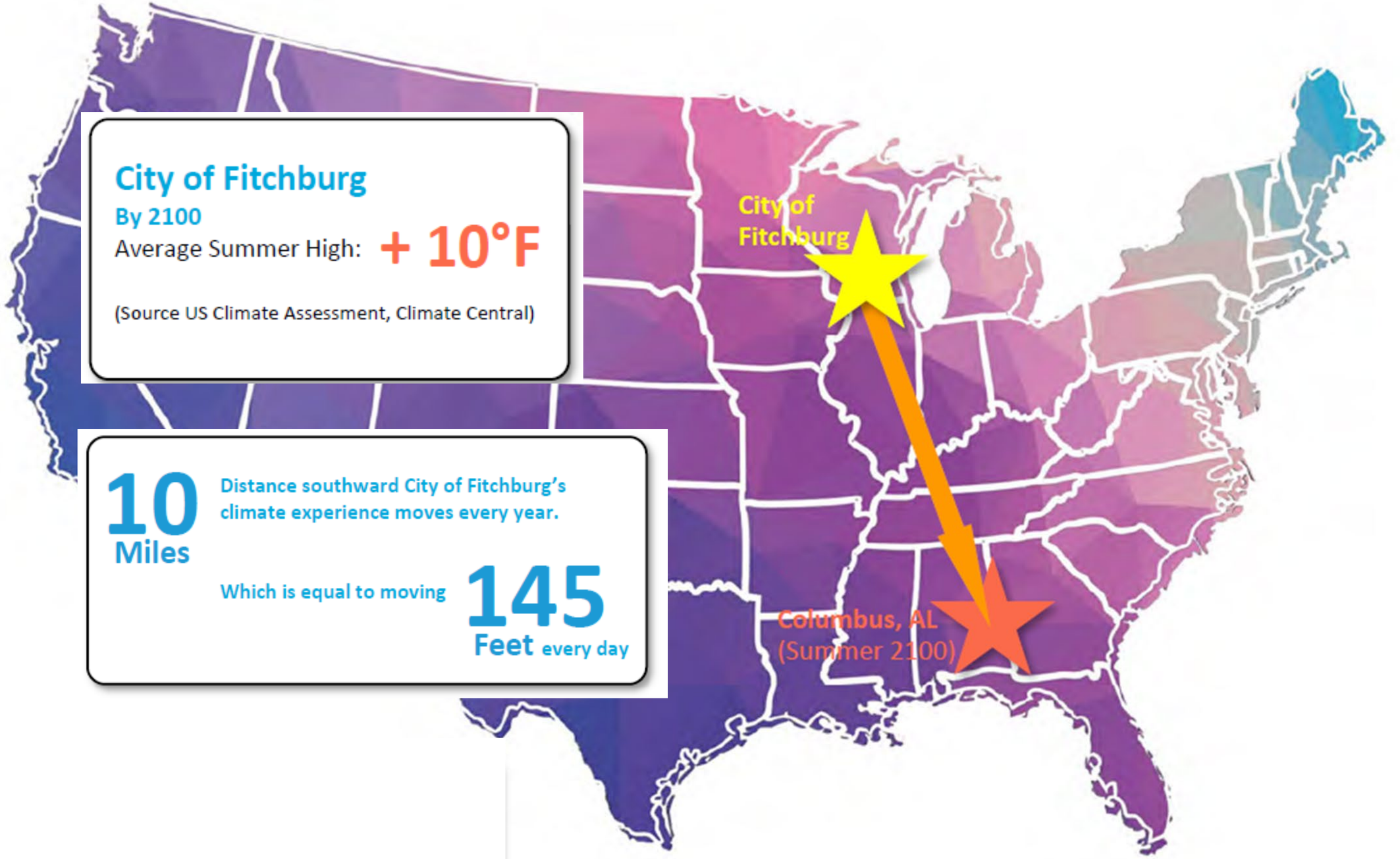
+12-15 more days
annually with a high temperature over 95°F.

+20% more
Days with heavy precipitation events (1" or more) annually

+45% more
air conditioning demand and energy needed than now.

+11-20 days longer
Growing, allergy, and mosquito season (days with minimum temp >32)

If we do not succeed in reducing our GHG emissions globally, most of these numbers will double (*or more*) by the end of the century.


City of Fitchburg
By 2100
Average Summer High: + 10°F
(Source US Climate Assessment, Climate Central)
10 Miles
Distance southward City of Fitchburg's climate experience moves every year.
Which is equal to moving 145 Feet every day
City of Fitchburg
Columbus, AL (Summer 2100)

Primary Climate Risks


Extreme Weather / Temp


Flood


Air Quality


Vector-Borne


Food Insecurity


Water Quality


Waterborne


Power Failure

Climate Related Economic Risks


Crop Yield


Mortality


Energy Costs


Property Crime


Violent Crime

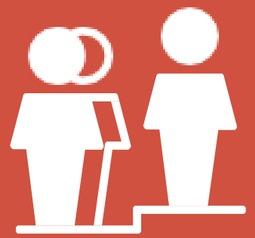
Community Groups Most Vulnerable


Children


Older Adults


Individuals with Disabilities


Those in Economic Stress


People of Color


At-Risk Workers


Food Insecure Individuals


Individuals With Limited Access to Mobility

Primary Climate Risks

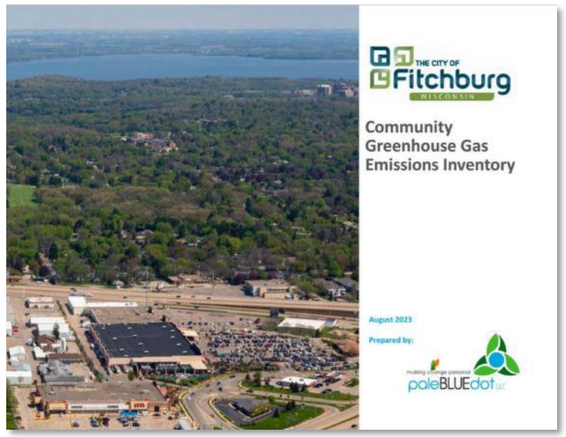
Climate Related Economic Risks

Community Groups Most Vulnerable

Foundational Document Review

Sustainability Baseline Documents

GHG Inventory and Forecast



2014 By The Numbers

GHG Emissions
446,008
17.12 MT Per-Capita
37.55 MT / Job
0.2509 MT / $1,000 GDP

Population
26,050

GDP
$1,777,953,572
$68,252 GDP Per-Capita

Employment
11,877

2022 By The Numbers

GHG Emissions
419,413
14.17 MT Per-Capita
34.01 MT / Job
0.1892 MT / $1,000 GDP

Population
29,606

GDP
$2,216,582,118
$74,869 GDP Per-Capita

Employment
12,332

8 Year Trend Dashboard

GHG Emissions
-26,595 -5.96%
-2.95 MT Per-Capita
-3.54 MT / Job
-0.06 MT / $1,000 GDP

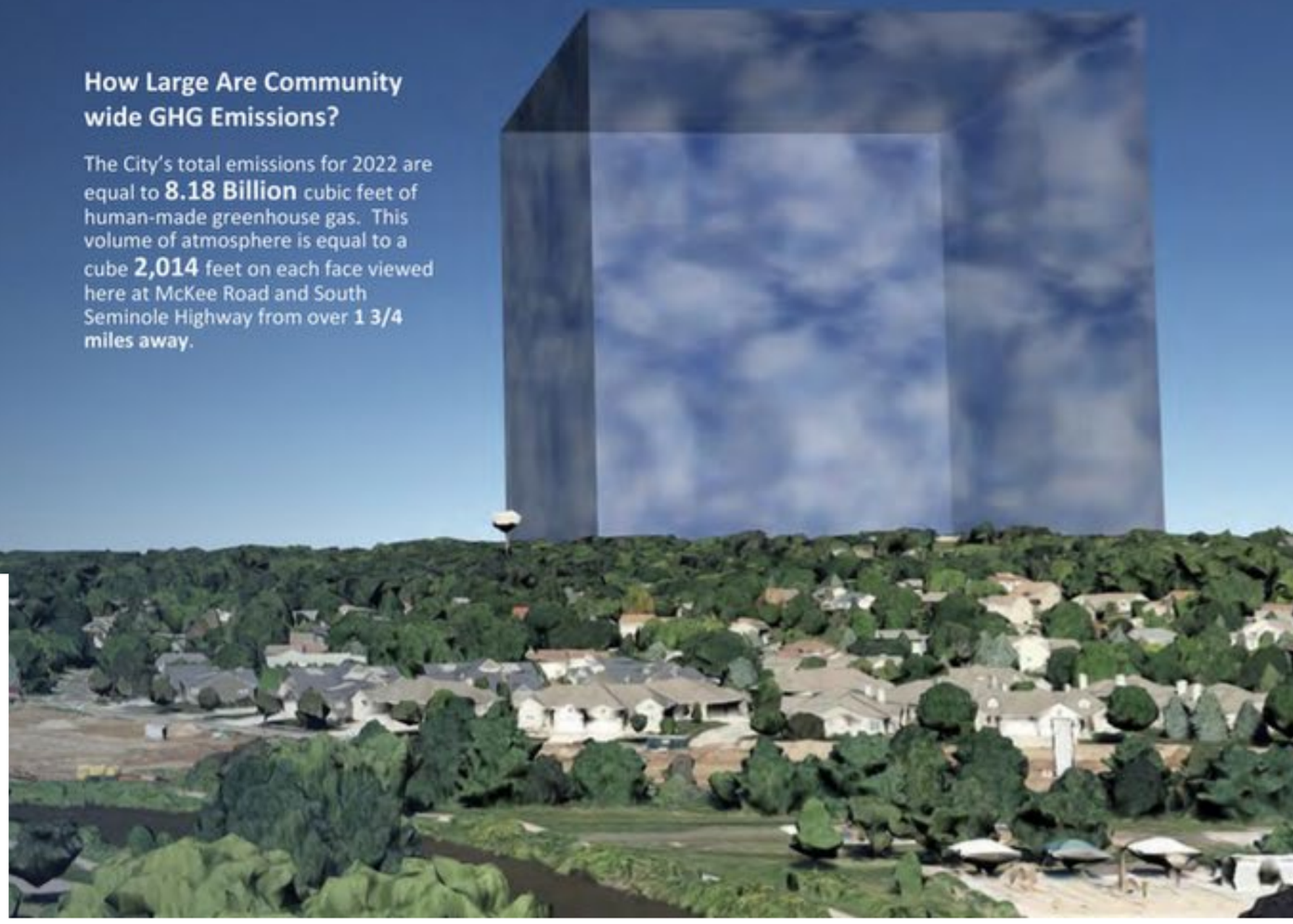
Population
+3,556 +13.65%

GDP
+$438,628,546 +24.67%
+$6,618 GDP Per-Capita

Employment
+455 +3.83%

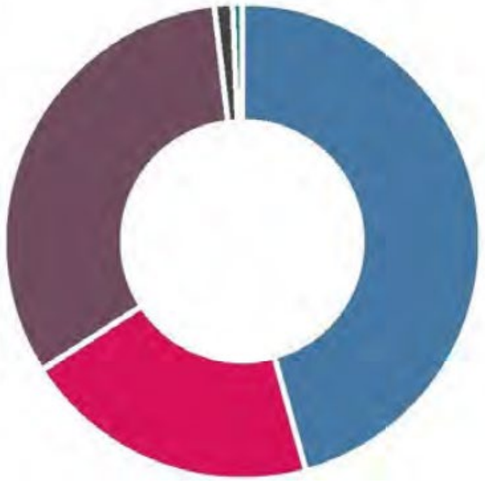
How Large Are Community wide GHG Emissions?

The City's total emissions for 2022 are equal to **8.18 Billion** cubic feet of human-made greenhouse gas. This volume of atmosphere is equal to a cube **2,014** feet on each face viewed here at McKee Road and South Seminole Highway from over **1 3/4 miles away**.



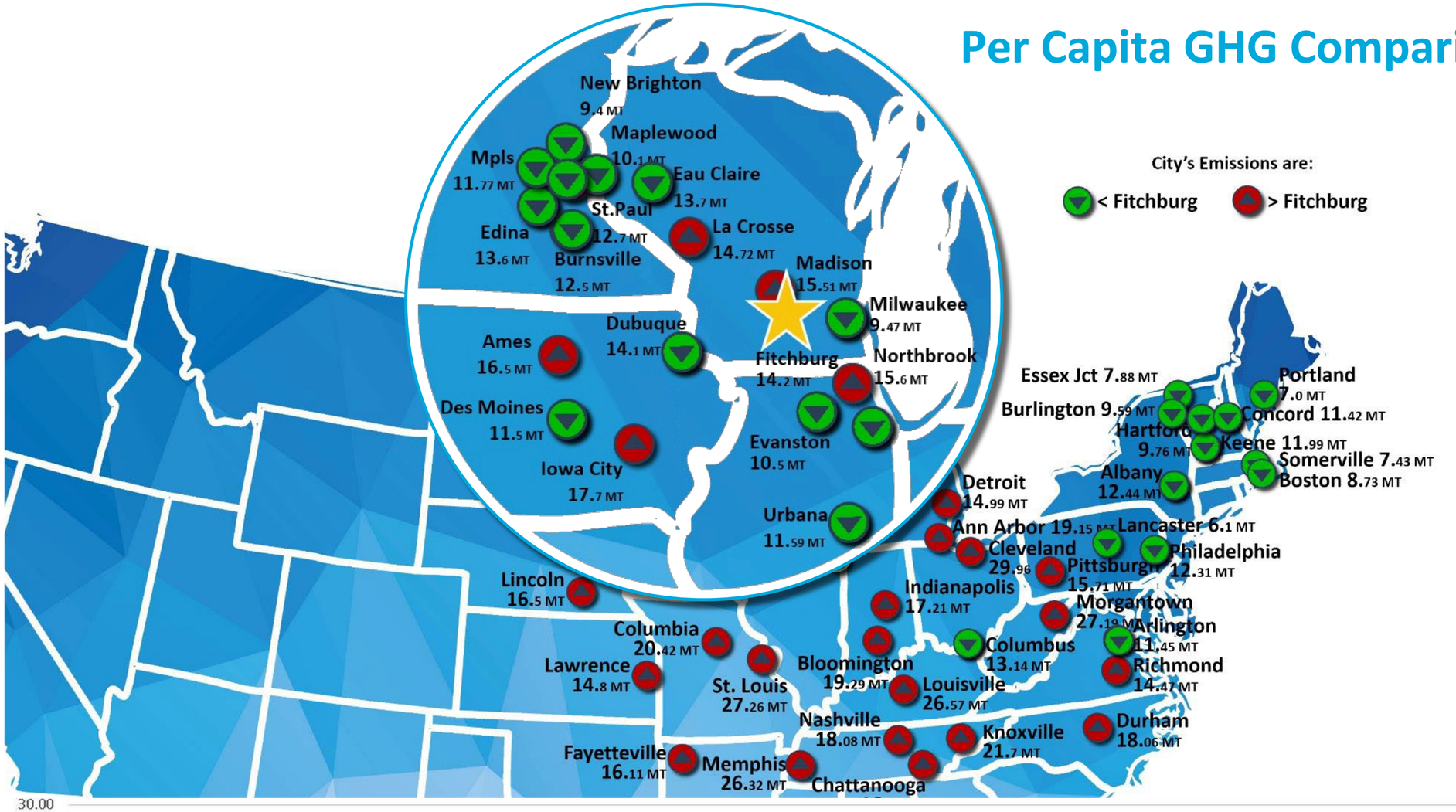
City of Fitchburg
Community wide total
419,413 metric tons in
13.65% from 26,050 to
The City of Fitchburg's
the same timeframe, c
emissions decrease.

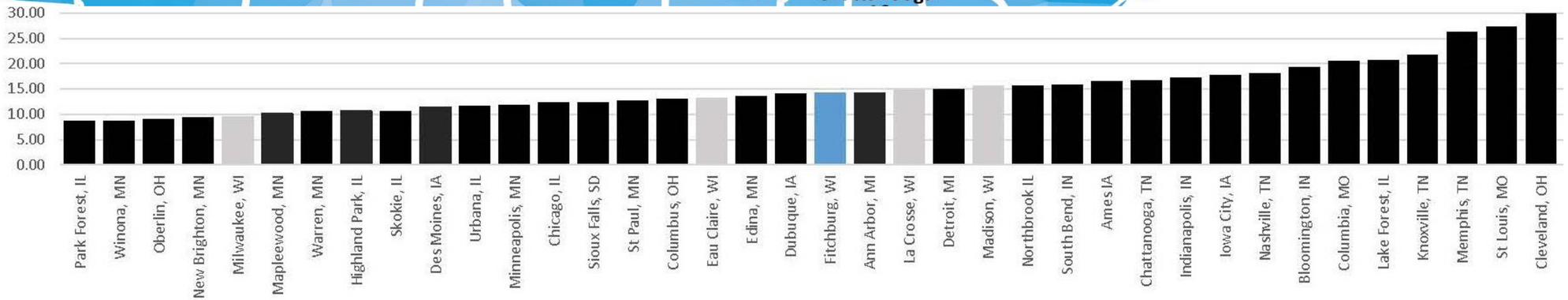
City-Wide GHG by Sector



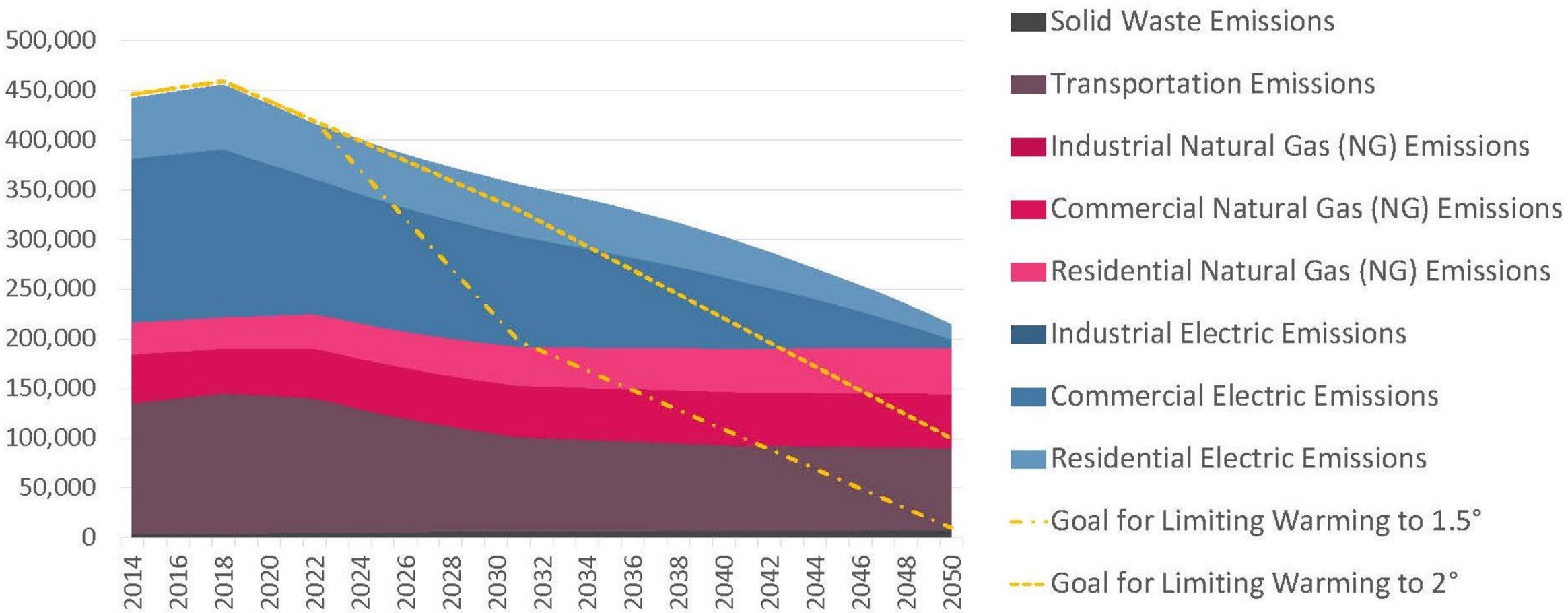
0.7% Water + Wastewater
1.2% Solid Waste
32.2% Transportation
20.2% Heating Fuel
45.7% Electricity

Per Capita GHG Comparison





GHG Emissions Forecast



Foundational Document Review

Sustainability Baseline Documents

Ground Cover & Heat Island Study

Section 02 Land Coverage Characteristics

Click here to return to TOC

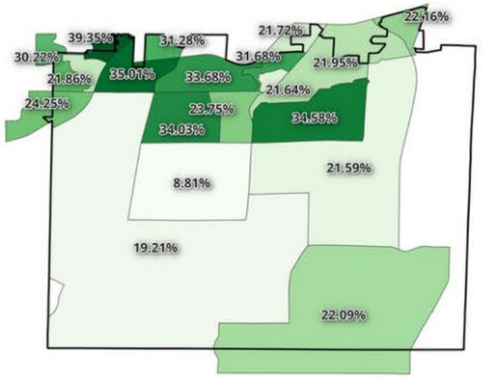
Classification of coverage categories included Tree Canopy, Grass, Water, Impervious Surface Light, and Impervious Surface Dark.

Tree Canopy Coverage
(See Appendix 3 for census area reference map)

City Average: 21.9%

City High: 39.4%
Tract 5.01 bg2

City Low: 8.8%
Tract 107.01 bg3

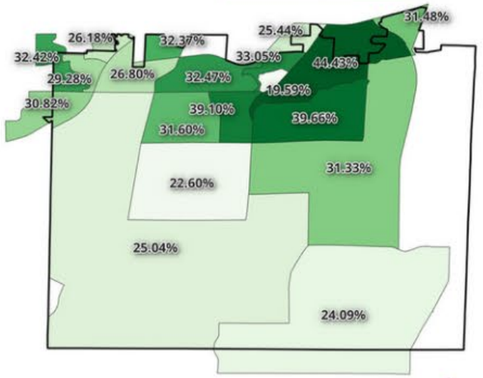


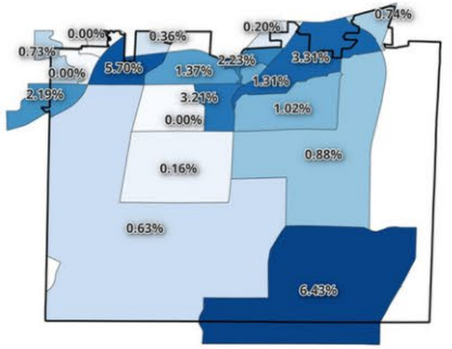
Lawn and Grass Coverage
(See Appendix 3 for census area reference map)

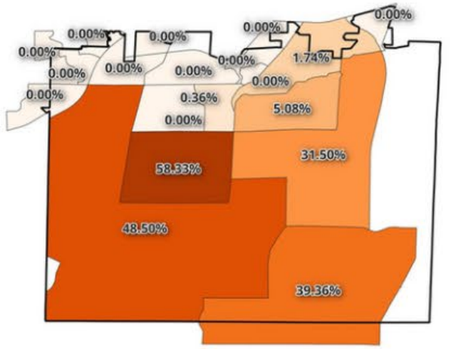
City Average: 30.9%

City High: 44.4%
Tract 14.05 bg2

City Low: 19.6%
Tract 14.04 bg 3







Land Coverage Characteristics

Open Water Coverage
(See Appendix 3 for census area reference map)

City Average: 2.0%

City High: 5.7%
Tract 6 bg4

City Low: 0.0%
multiple tracts

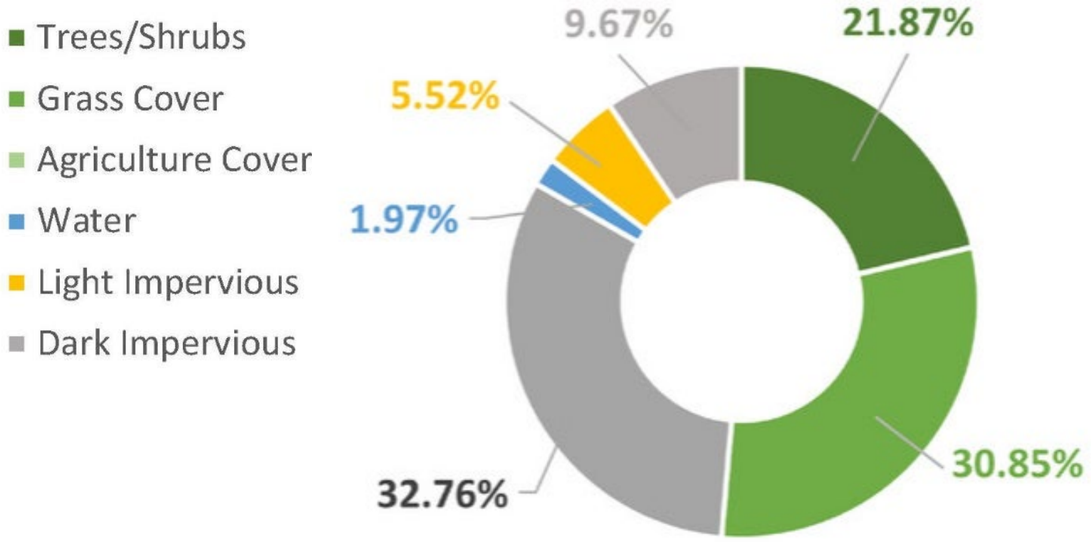
Agriculture Land Coverage
(See Appendix 3 for census area reference map)

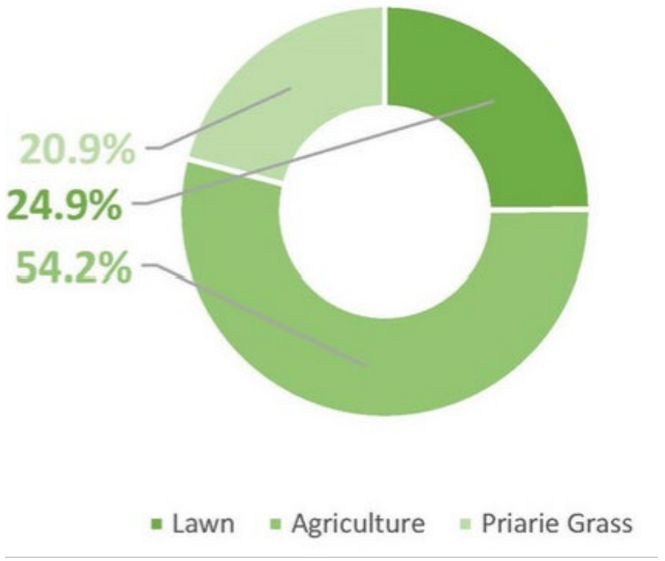
City Average: 32.8%

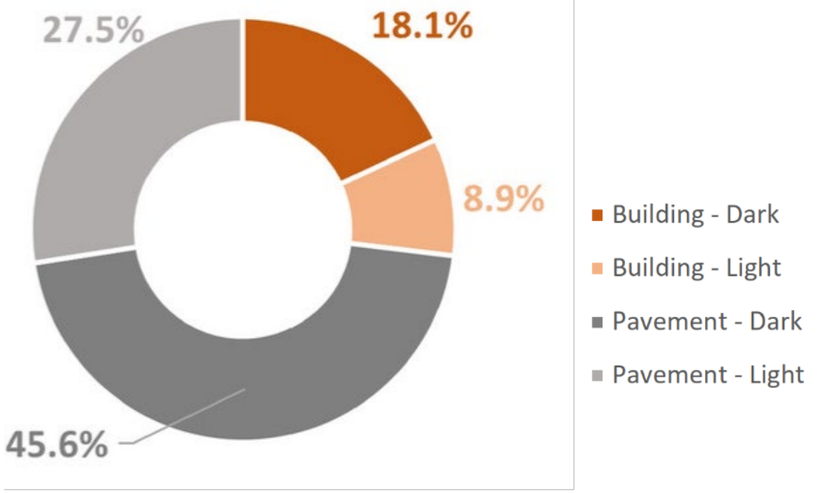
City High: 58.3%
Tract 107.01 bg3

City Low: 0.0%
multiple tracts

Ground Cover Breakdown by Type

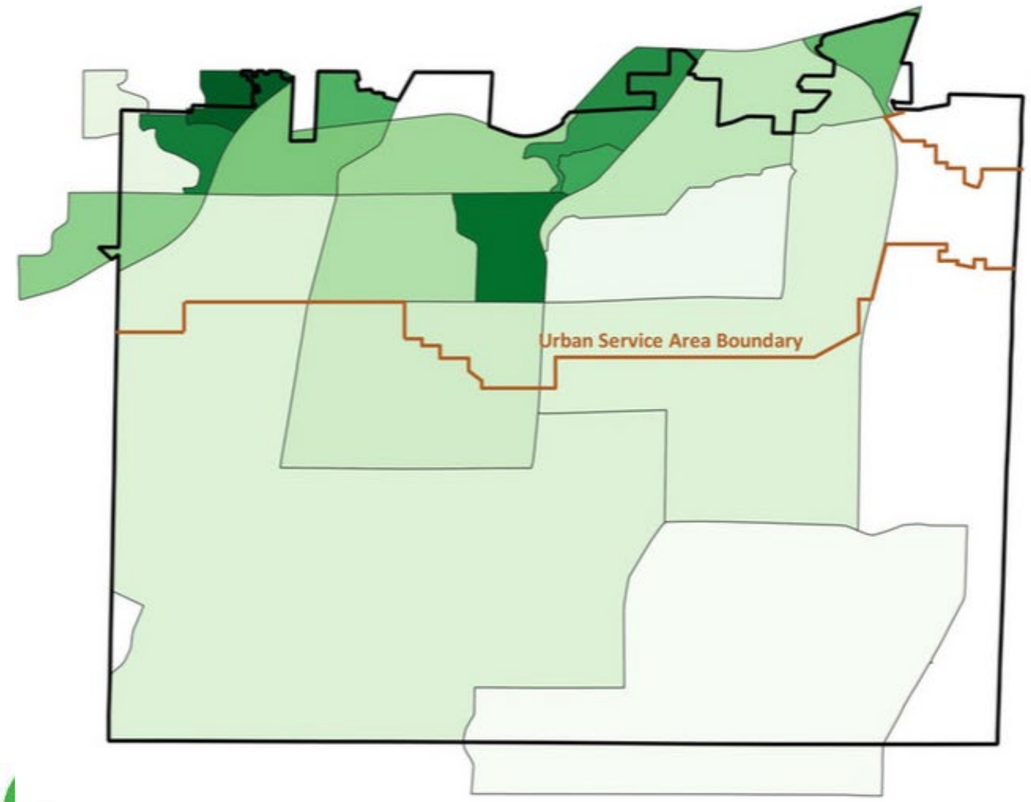






Preliminary Tree Canopy Increase Recommendation (2040)

Based on tree stock potential (available land not used as buildings, roads, etc) and benefit potential for vulnerable populations, equity, and micro heat island



Tree Canopy Increase Over Existing Tree Canopy

- 3.88%
- 3.96%
- 4.18%
- 4.22%
- 5.87%
- 11.05%
- 13.50%
- 13.57%
- 14.80%
- 16.42%
- 17.00%
- 21.23%
- 21.73%
- 24.13%
- 25.51%
- 27.97%
- 28.15%
- 55.23%

Tree Canopy In-crease in Absolute Land Cover %

- 0.5%
- 0.8%
- 0.9%
- 1.3%
- 1.4%
- 2.4%
- 3.6%
- 3.8%
- 4.6%
- 4.7%
- 5.5%
- 5.7%
- 6.1%
- 6.6%
- 6.7%
- 7.6%
- 21.7%

The recommended Tree Stock increase goals are:

For areas in the top 1/3rd
Census area Priority Ranking: **12%**

For areas in middle 1/3rd
Census area Priority Ranking: **7.25%**

For areas in bottom 1/3rd
Census area Priority Ranking: **2.5%**

Resulting 2040 Tree Canopy Coverage Goal:

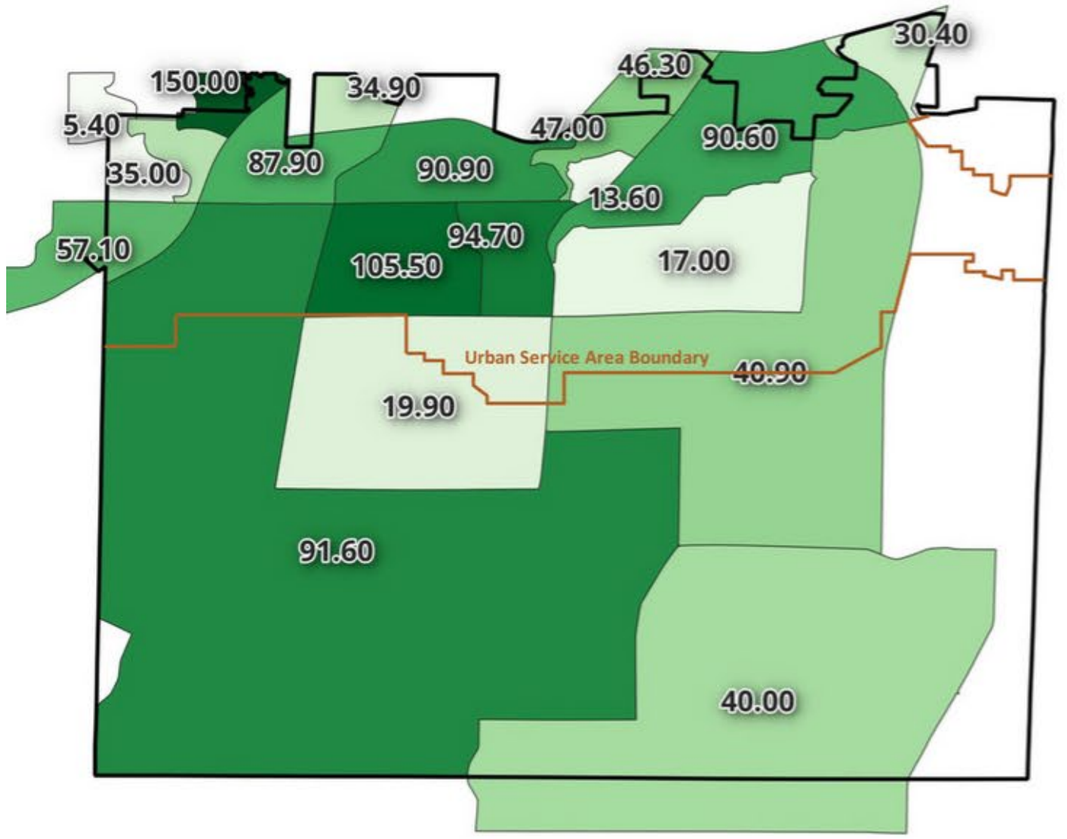
Citywide Average: **23.5%**

Urban Service Area Average: **32%**

New Tree Planting Annual Target to Meet 2040 Tree Canopy Goal (CN)

Community-Wide Total (Note, Acreage represents the canopy coverage at year of planting, with an assumed new tree crown radius of 5' planted no more than 22' apart):

2,800 New Trees **31** Acres



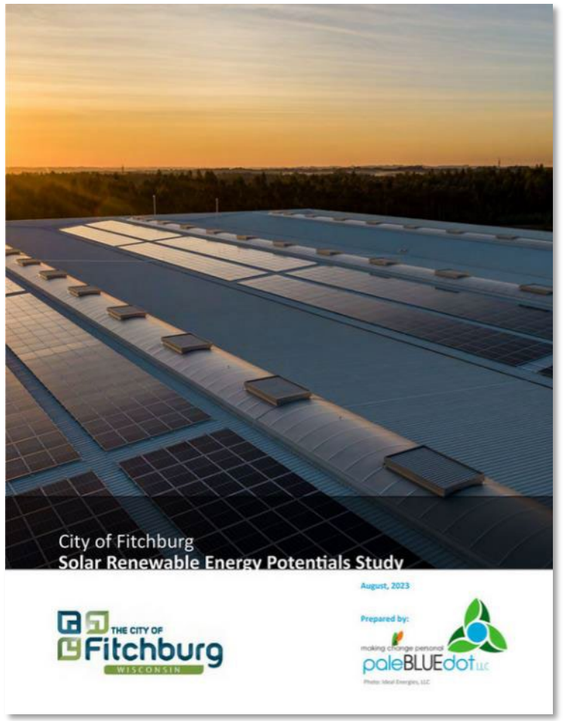
Note, the proposed framework does not include land in use as agriculture in calculations of potential tree canopy increases.

	CB (existing)		CG (growth)		CM (loss)		CN (new)		CT (year goal)	UTC (year end coverage %)
2024	4626	+	202	-	-213	+	31	=	4646	22.0%
2025	4646	+	203	-	-214	+	31	=	4666	22.1%
2026	4666	+	204	-	-215	+	31	=	4686	22.2%
2027	4686	+	204	-	-216	+	31	=	4706	22.3%
2028	4706	+	205	-	-216	+	31	=	4727	22.3%
2029	4727	+	206	-	-217	+	31	=	4747	22.4%
2030	4747	+	207	-	-218	+	31	=	4767	22.5%
2031	4767	+	208	-	-219	+	31	=	4787	22.6%
2032	4787	+	209	-	-220	+	31	=	4807	22.7%
2033	4807	+	210	-	-221	+	32	=	4827	22.8%
2034	4827	+	211	-	-222	+	32	=	4847	22.9%
2035	4847	+	211	-	-223	+	32	=	4867	23.0%
2036	4867	+	212	-	-224	+	32	=	4887	23.1%
2037	4887	+	213	-	-225	+	32	=	4908	23.2%
2038	4908	+	214	-	-226	+	32	=	4928	23.3%
2039	4928	+	215	-	-227	+	32	=	4948	23.4%
2040	4948	+	216	-	-228	+	32	=	4968	23.5%

Foundational Document Review

Sustainability Baseline Documents

Renewable Energy Potential



City Wide Municipal Solid Waste Plasma Gasification Potential

Exploration of gasification of
gy and beneficial use bi-prod
competition with traditional
and recycling efforts. Gasific
this established waste hierar
duce, reuse, recycle and com
generated. Rather than send
where harmful greenhouse g
ture the energy value of the
tion energy recovery facilitie
eration may be a potential fo
ates solid waste, regardless
waste is currently landfilled
ries. For communities that c
to locations outside of the co
create a gasification plant wi
plore partnering with the exi
nity's solid waste.

What is Gasification?

Gasification can be defined a
that uses heat and a low-oxy
carbonaceous feedstock such
partial oxidation to release o
means that oxygen is injecte
plete combustion as it does i
incineration, gasification con
stock into gaseous product b
temperatures in a controlled
ally burning it. At such elevat
and liquid wastes are broken
ecules, which are mainly a m
and hydrogen (H_2) known as
has energy content and can
power in fuel cells or as a fue
after cleaning.

How Does a Gasification Sys

Waste is fed into the top of t
airlock. Purified oxygen and
The gasification reaction occ
2,200°C (4,000°F). As the wa
it passes through several rea
area at the base. In each zon
off. At the lowest point of th
to carbon char, inorganic ma
oxygen and steam react with
synthesis gas (syngas), comprised predominately of carbon monoxide and hydrogen. This reaction is highly exothermic, meaning that it releases a large amount of energy in the form of heat. The syngas and heat rise through the gasifier, interacting with the waste as it descends through the vessel.

Syngas then exits the top of the gasifier vessel. At the base of the gasifier, inorganic materials and metals collect in a molten state. This molten liquid is periodically tapped out and cools into a vitrified stone that is very similar in appear-

efforts, as their purity requirements are more stringent than that of electricity production. As a result, each desired end-product may require a unique syngas cleaning and conditioning process.

Plasma Gasification Potential in City of Fitchburg

According to Sierra Energy, based on the City of Fitchburg's total landfilled municipal solid waste, the current waste stream within Fitchburg could support the following gasification derived energy potential:

Dane County Total		City of Fitchburg
331,884,614	**kWh Electricity** annually	3,165,686
	or	
73,461,793	**Pounds Hydrogen Fuel** annually Usable as a fuel alternative for fuel cells or engine generator sets	700,716
	or	
18,326,962	**Gallons of Renewable Diesel** annually Usable as a fuel alternative for vehicles	174,812
	or	
413,189,680	**Pounds of Ammonia** annually Usable as a fuel alternative for fuel cells or engine generator sets	3,941,216

6x
Municipal Operations Diesel Consumption

Graphic Source: Sierra Energy

Buildings and Energy

LEED for Cities and Communities Measures

LEED for Cities and Communities is a rating system developed by the US Green Building Council. The rating system is an extension of the Leadership in Energy and Environmental Design (LEED) green building certification program. LEED for Cities measures related to this section have been included in the consideration of the development of the Strategic Goal Recommendations outlined at the end of this section.

The following are measures included in the LEED for Cities and Communities which relate to this section:

Green Building Policy and Incentives
Option: Buildings Owned and/or Operated by the Local Government
Option: Green Building Policy and Incentives

Housing and Transportation Affordability
Option: Comprehensive Housing Policy
Option: Housing and Transportation Costs
Option: Affordable Housing Production
Option: Affordable Re

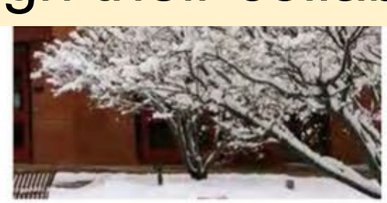
Power Access, Rel
Case 1. Electricity Acc
Reliability Performanc
Power Surety and Res

Energy and Green
Measure the annual e
emissions for the city

Energy Efficiency
Option: Energy Audit
Option: Street Lightin
Option: Water and W
Option: District Energ
Option: Energy Efficie

Renewable Energy
Option: Renewable Energy in Electricity Supply
Option: Renewable Energy in Total Energy Consumption
Option: Renewable Energy Programs and Policies

Net-Zero Carbon and Climate Action
Option: City-wide Carbon Neutrality Accountability
Option: Climate Action Plan
Option: Reduction in Carbon Intensity



Buildings and Energy

Strategic Goal Recommendations— Community Wide

Based on the reviews outlined in this section, we recommend the City of Fitchburg explore establishing the following community-wide Buildings and Energy Strategic Goals:

BE 1: Improve total Community wide building energy efficiency (all sectors) by 10% for electricity and natural gas by 2030.

energy poverty from 8% to 4% by 2030.

BE 6: Increase resilience of community-wide buildings to potential impacts of climate change. (impacts include increased flooding risk, increased extreme weather events, and increased extreme temperature events).

Strategic Goal Recommendations
Government Operations

Based on the reviews outlined in this section, we recommend the City of Fitchburg explore establishing the following Buildings and Energy Strategic Goals:

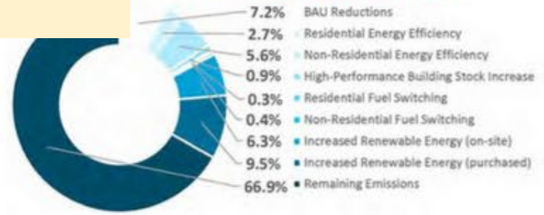
BE 6: Improve total government building energy efficiency by 15% by 2030 (electricity and natural gas, including water and wastewater infrastructure).

ve 15% government building thermal "fuel switching" te fossil fuel combustion to electrification by 2030.

ase renewable energy to 100% (on-site and green chase) of government building electric use by 2030.

ase resilience of government facilities to the impacts change.

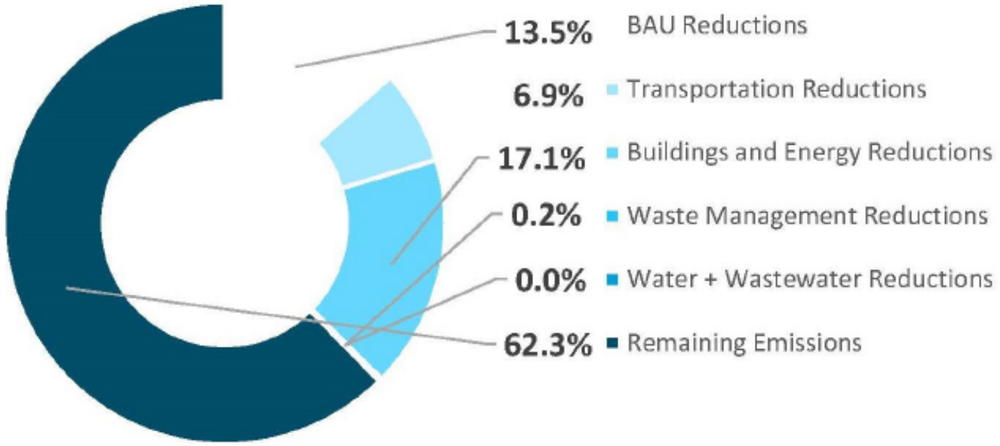
mission Reductions Achieved by Draft Strategies



Intent of recommendations:
Just a place to start! The Planning team will be discussing, changing, and finalizing these goals through their collaborative process.

Preliminary Goal / Strategy Overview

Share of Total Projected Potential Emission Reductions by Sector by 2030 from 2022 Baseline (preliminary estimate):



Based on the illustrated potential reductions included in this document, we recommend the following as a preliminary Climate Mitigation goal statement for consideration by the planning team:

Recommended City of Fitchburg GHG Reduction Goal:

"To reduce city-wide GHG emissions by 35% below 2022 levels by 2030, and achieve carbon neutrality by 2050."*

*2030 goal is equivalent to 40% reduction from a 2018 baseline and within IPCC recommendations

What Are Your Thoughts

TAKE THE CITY'S SURVEY

Available through Wednesday February 14th

To take the survey, please go here:

https://palebluedot.llc/fitchburg-sustainability

GIVE INPUT ON DRAFT PLAN GOALS

Available today – please walk around and add your thoughts!

If you are online you can find them here:

https://1drv.ms/f/s!AjXEmMthmWPLjP0ttunlQdD6LTiy3w?e=vmmqcx