EWR Low Income Workgroup

February 13, 2020

MPSC
Michigan Public Service Commission

Agenda

9:00 – 9:20	Welcome and Introductions Into to the Workgroup Brad Banks, MPSC
9:20 – 10:00	City of Grand Rapids Strategic Plan Alison Waske Sutter, Sustainability and Performance Management Officer City of Grand Rapids
10:00 – 10:30	Zero Cities Project Sergio Cira-Reyes Urban Core Collective, Grand Rapids
10:30 – 10:50	Q & A
10:50 – 11:00	Break Working Lunch Provided By DTE
11:00 – 11:30	Environmental Justice and Community Engagement NAACP Grand Rapids
11:30 – 12:00	Grand Rapids topics
12:00	Open Forum/Q & A Announcements Adjourn

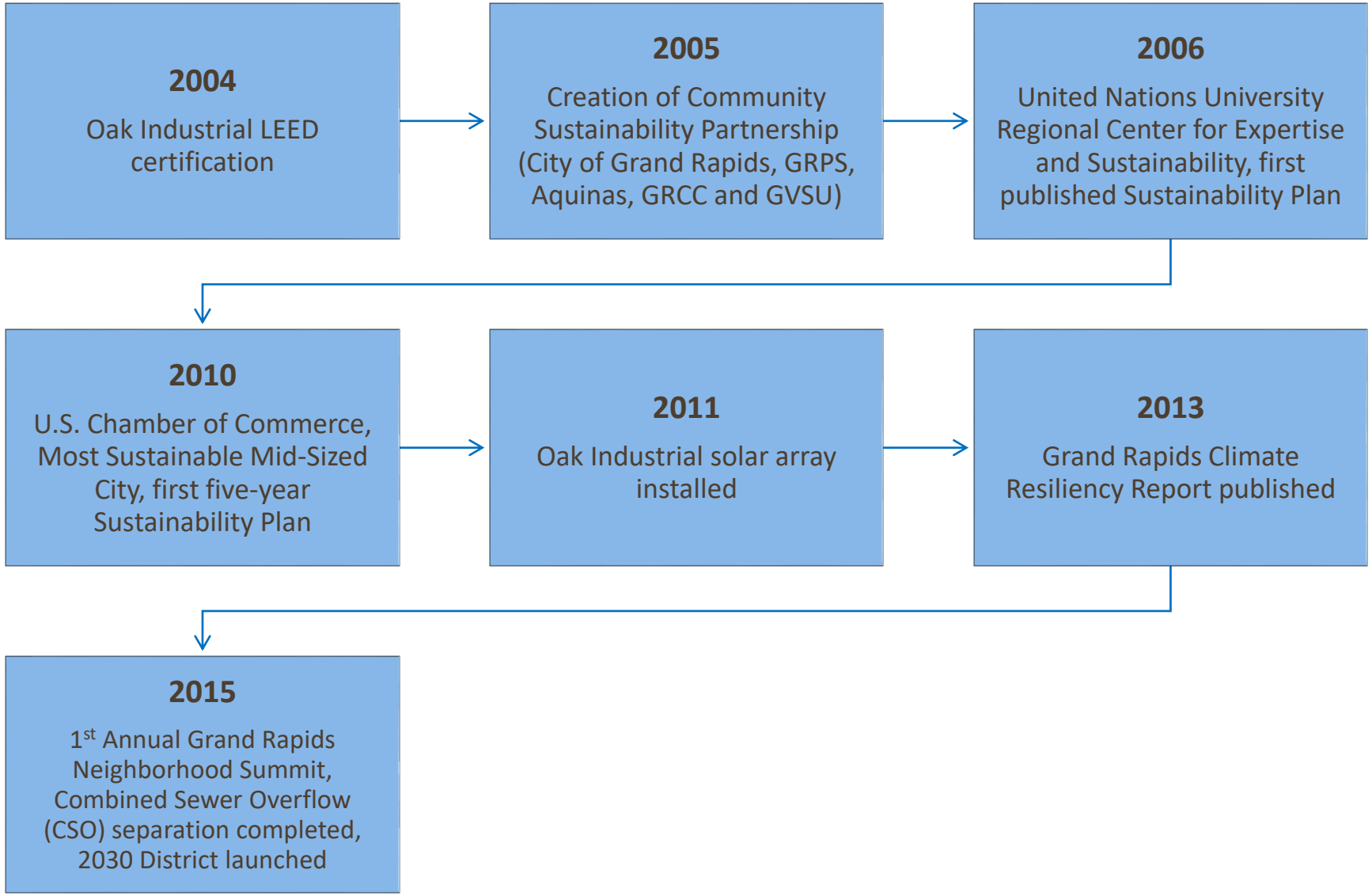
Sustainability Initiatives in Grand Rapids

AWMA & Environmental Section of MI State Bar
Alison Sutter, November 14, 2019

Items to Review

- City of Grand Rapids sustainability journey
- A new strategic direction for the City
- Applying an equity lens
- Zero Cities Project
- Community Collaboration on Climate Change

Sustainability Journey 2004 - 2015:



Sustainability Journey 2016 - Present:

2016

- Second five-year Sustainability Plan FY2017 – FY2021 published
- City accepted into the first ever Racial Equity Here Cohort with Government Alliance for Race and Equity (GARE)
- Mayor's Greening Initiative launched

2017

- Zero Cities Project
- We Are Still In
- PACE
- Neighborhood Match Fund
- Grand Rapids Racial Equity Project
- Compressed natural gas (CNG) buses
- Biodigestion
- Good for Grand Rapids

2018

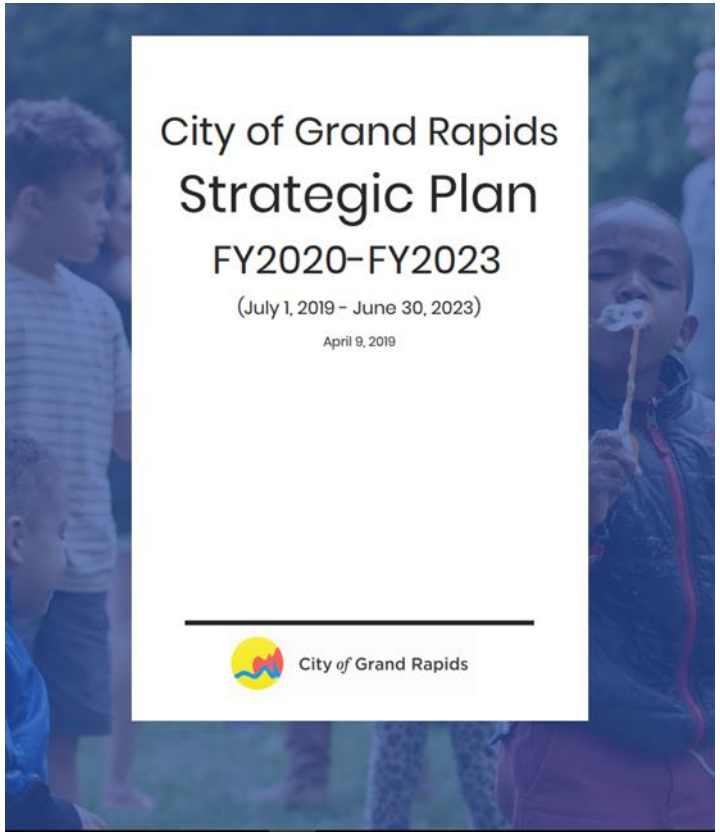
- Michigan Green Communities Gold Award
- USGBC-WM's 2030 District Leadership Award
- Energy Advisory Committee launched
- 6 Energy Star Certified buildings

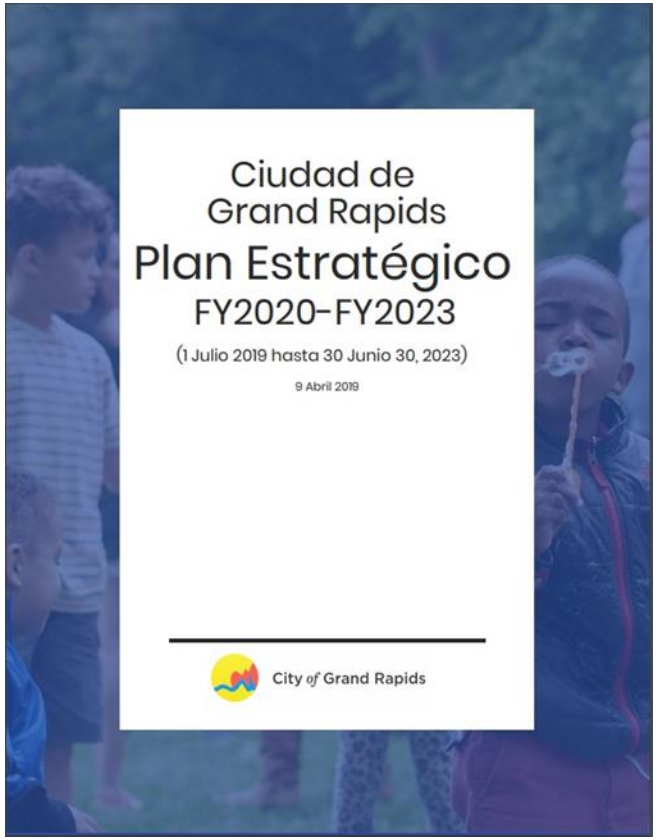
2019

- City's Strategic Plan adopted with Sustainability as one of six core values and Health and Environment as one of six strategic priorities
- SolSmart
- Launch Community Collaboration on Climate Change (C4)
- Onsite compost certification
- Bike plan
- Site Selection's #1 metro area for sustainable development

City of Grand Rapids Strategic Plan FY2020 – FY2023

- City Commission approved on April 9, 2019
- www.grandrapidsmi.gov/strategicplan





Values

Our values are what we stand for. They are embedded throughout the entire plan and guide all City work.

Accountability — Always acting with integrity and transparency and being responsible for what we do and say.

Collaboration — Working together in partnership with others; teamwork.

Customer Service — Professionally serving those who live in, work in or visit the city. Providing respectful, excellent, high quality service and assistance before, during and after the person's interactions with the City.

Equity — Leveraging City influence to intentionally remove and prevent barriers created by systemic and institutional injustice.

Innovation — Challenging how things have been done before. Fulfilling community needs by offering new ways to serve our customers and enhance operations. Being nimble, self-aware and open to feedback.

Sustainability — The ability to be maintained; making decisions with an understanding of how those decisions will impact the environment, people and communities, and finances, both today and in the future

Vision

Grand Rapids will be nationally recognized as an equitable, welcoming, innovative and collaborative city with a robust economy, safe and healthy community, and the opportunity for a high quality of life for all.

Mission

To elevate quality of life through excellent City services.

Priorities

Governmental Excellence

A fiscally resilient government powered by high performing and knowledgeable staff equipped with the appropriate tools and resources to offer excellent, equitable and innovative public service.

Economic Prosperity and Affordability

Residents, employees and businesses have pathways to financial growth and security.

Engaged and Connected Community

Residents and stakeholders have awareness of and voice in decisions that affect them, and receive culturally-responsive and proactive communication.

Health and Environment

The health of all people and the environment are advocated for, protected and enhanced.

Mobility

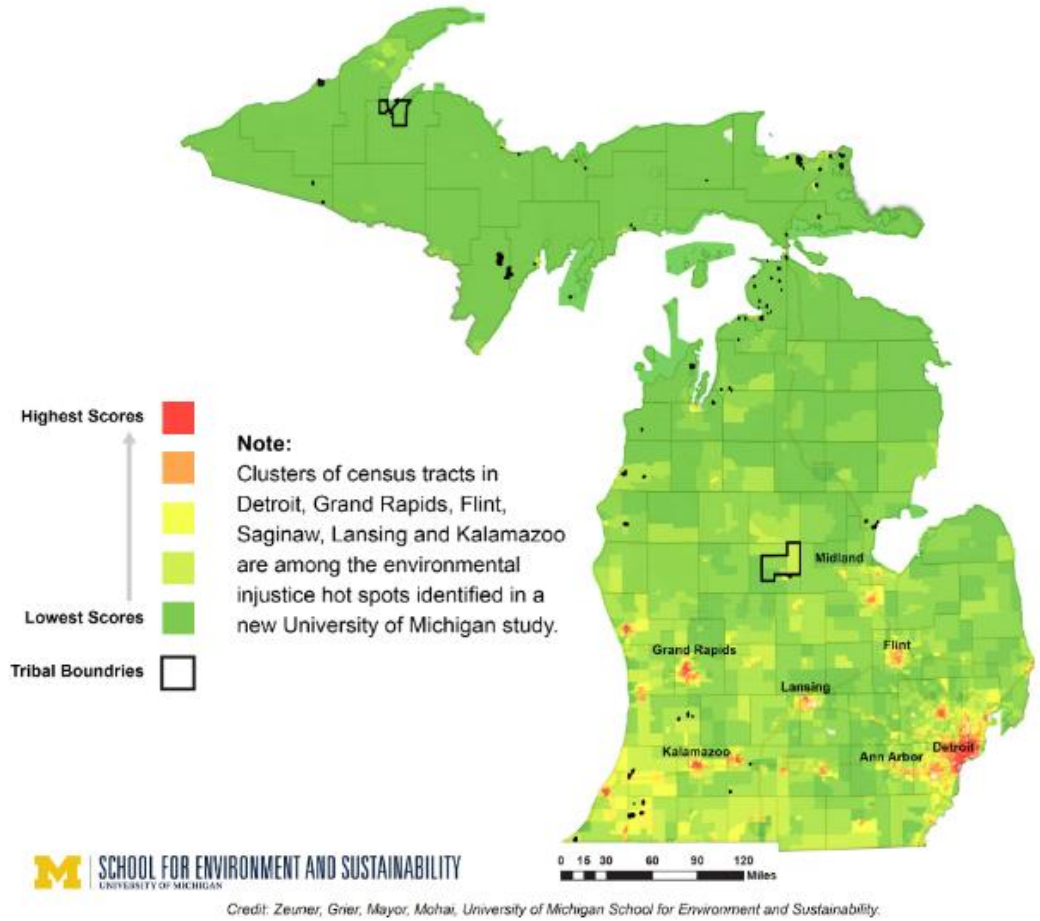
Innovative, efficient and equitable mobility solutions are safe, affordable and convenient to the community.

Safe Community

All people feel safe and are safe at all times throughout our community.

Applying an Equity Lens

Heat Map of Michigan Census Tracts Ranked by Environmental Justice Scores



Credit: Zeumer, Grier, Mayor, Mohai, University of Michigan School for Environment and Sustainability.

https://news.umich.edu/u-m-study-reveals-hot-spots-of-environmental-injustice-across-michigan/

DETROITERS WORKING FOR ENVIRONMENTAL JUSTICE

LINC UP™

https://drive.google.com/file/d/0B_Lg9FTjeoNzeFdDa3dEUDlaUoFsN1cxdmJKUlhJdG1HZVNF/view

Zero Cities Project

- Three-year grant funded project to develop a policy roadmap toward a zero net carbon building sector by 2050
  - Zero net carbon: produce on-site, or procure, enough carbon free renewable energy to meet the building operations' energy consumption
- 12 U.S. cities selected to participate
- Policy process informed by technical analysis that will include community collaboration and a focus on equity
- Meant to create a plan the City will implement to achieve the zero net carbon goal by all buildings – with economic incentives and planning programs
- USGBC West Michigan partnership, The Wege Foundation support

Boston, MA
Boulder, CO
Cambridge, MA
Grand Rapids, MI
Minneapolis, MN
New York, NY
Palo Alto, CA
Phoenix, AZ
Portland, OR
San Francisco, CA
Seattle, WA
Washington, D.C.

Grand Rapids

Preliminary Building Stock Assessment

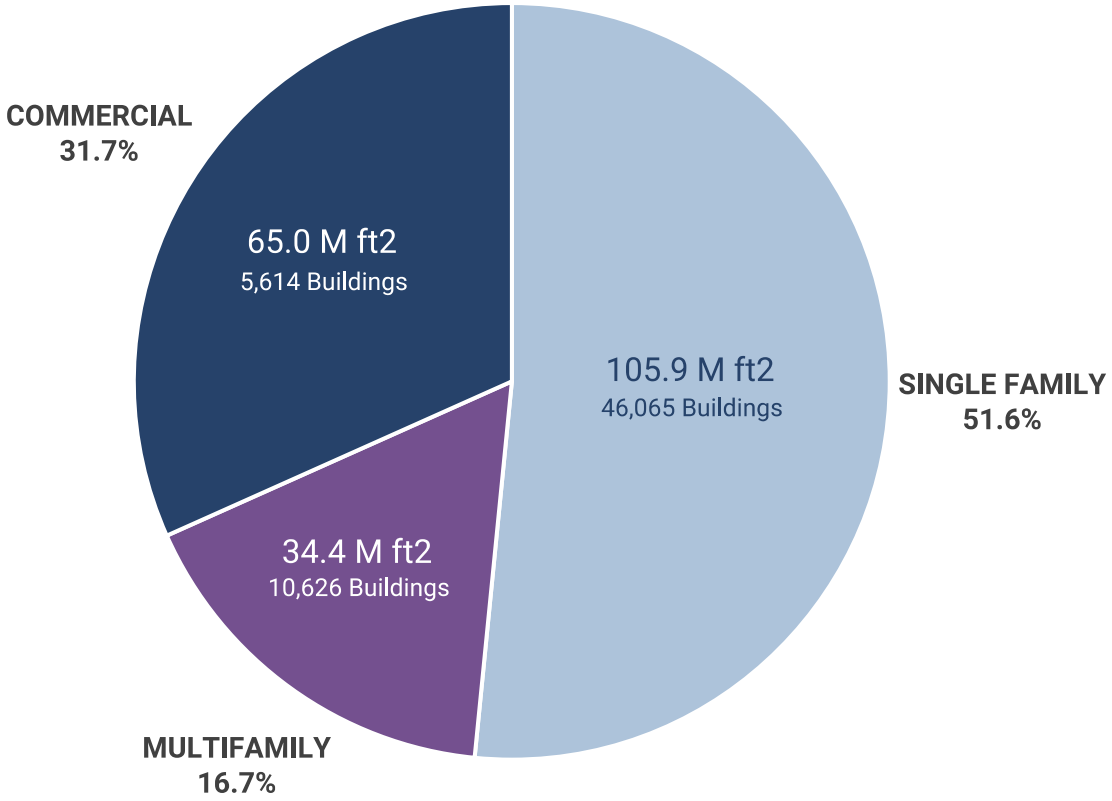
version: 2019.07.01

This building stock assessment consists of baseline and future projections of energy consumption, greenhouse gas emissions, and fuel types by building type and size, and includes information about historic “building intervention rates” such as sale transaction rates and renovation rates by major building types and size. The intents of the assessment are to (1) inform and direct future Zero Cities project work, (2) create a tool for analyzing the likely greenhouse gas emissions and energy impacts of the policies and strategies developed through Zero Cities project work, and (3) create a set of common metrics between Zero Cities project participants (eleven cities in total).

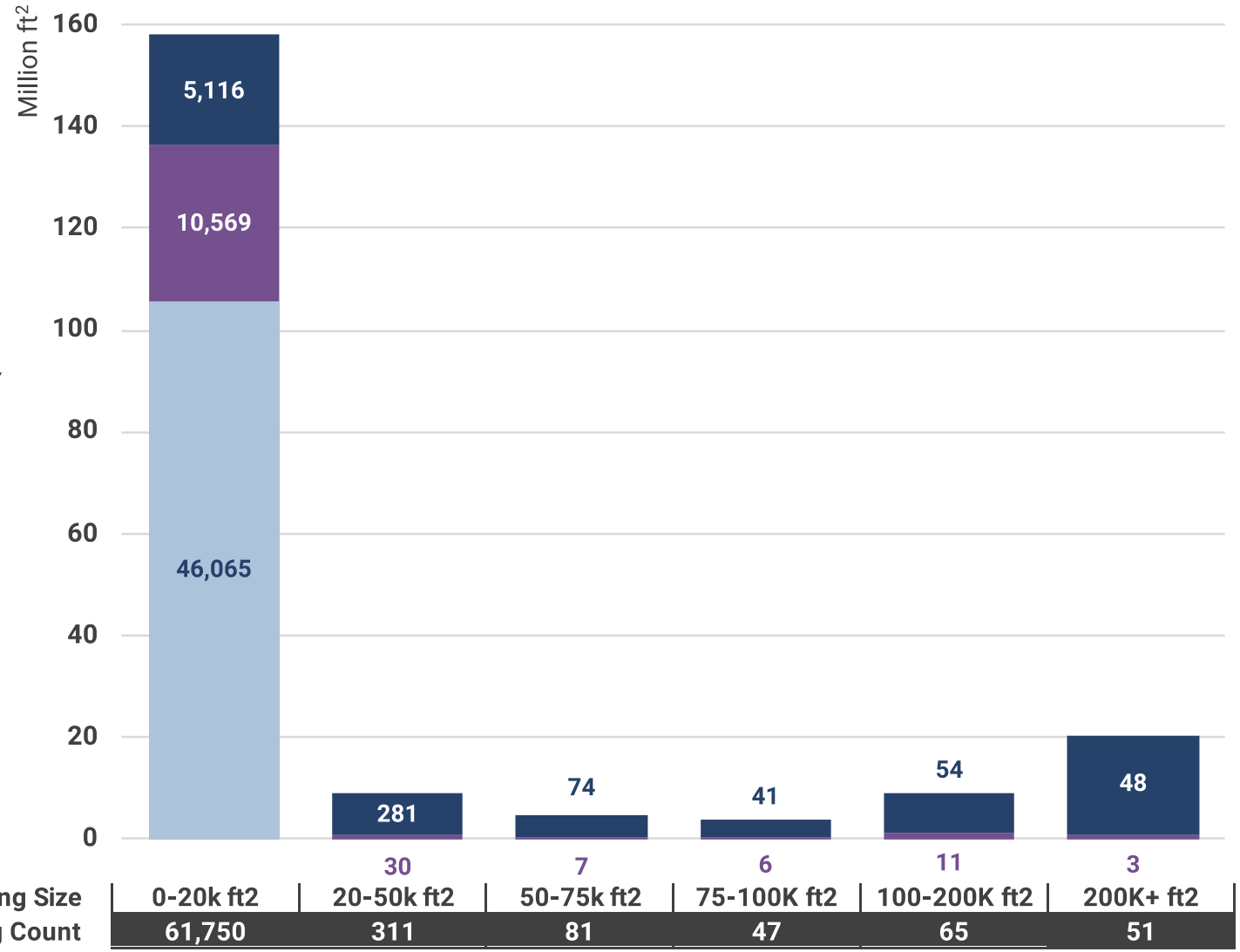
BUILDING AREA SUMMARY

GRAND RAPIDS, MI

Current Building Area by Type



Current Building Area by Size

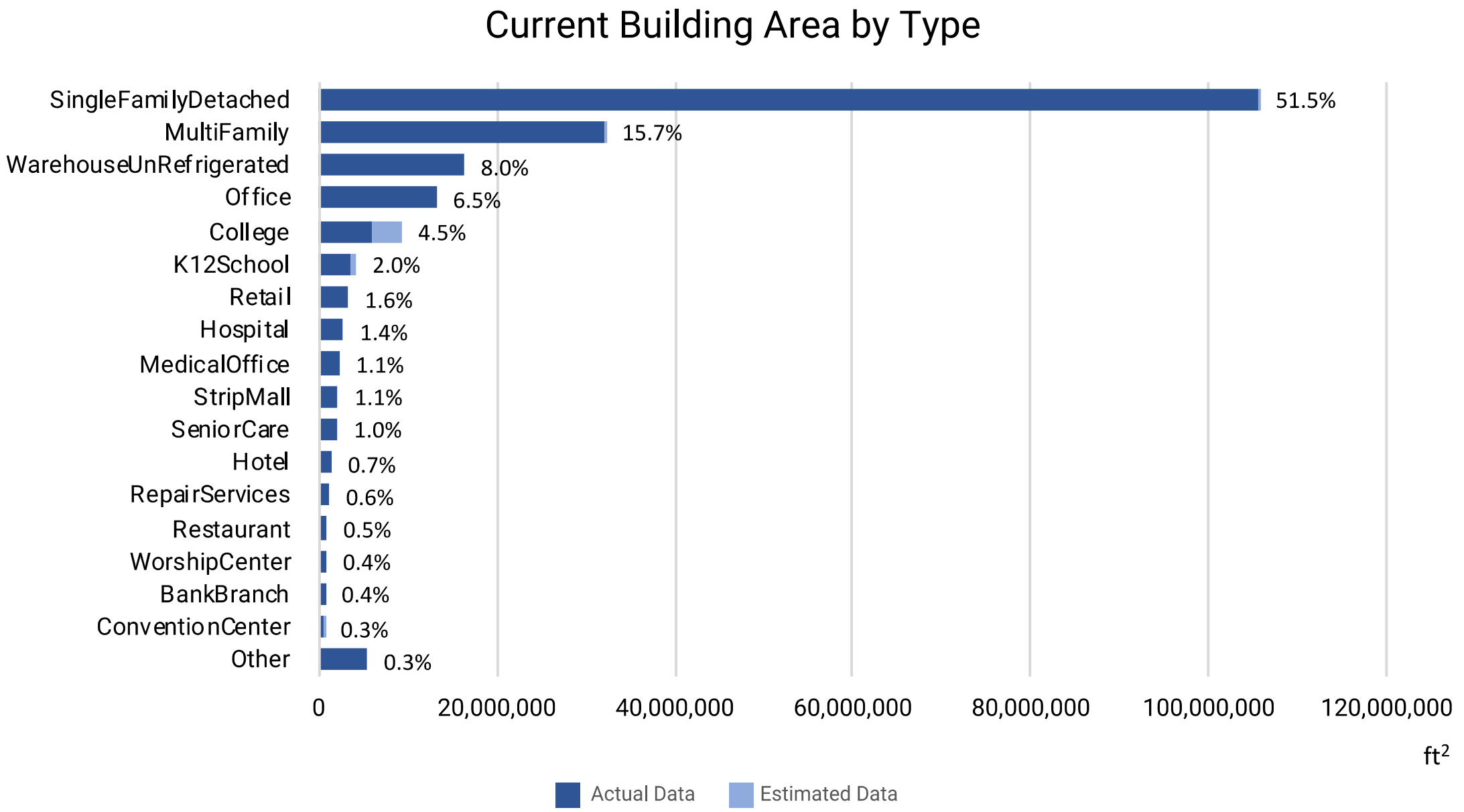


Current Building Stock

205,265,759 square feet
62,305 buildings

BUILDING AREA SUMMARY

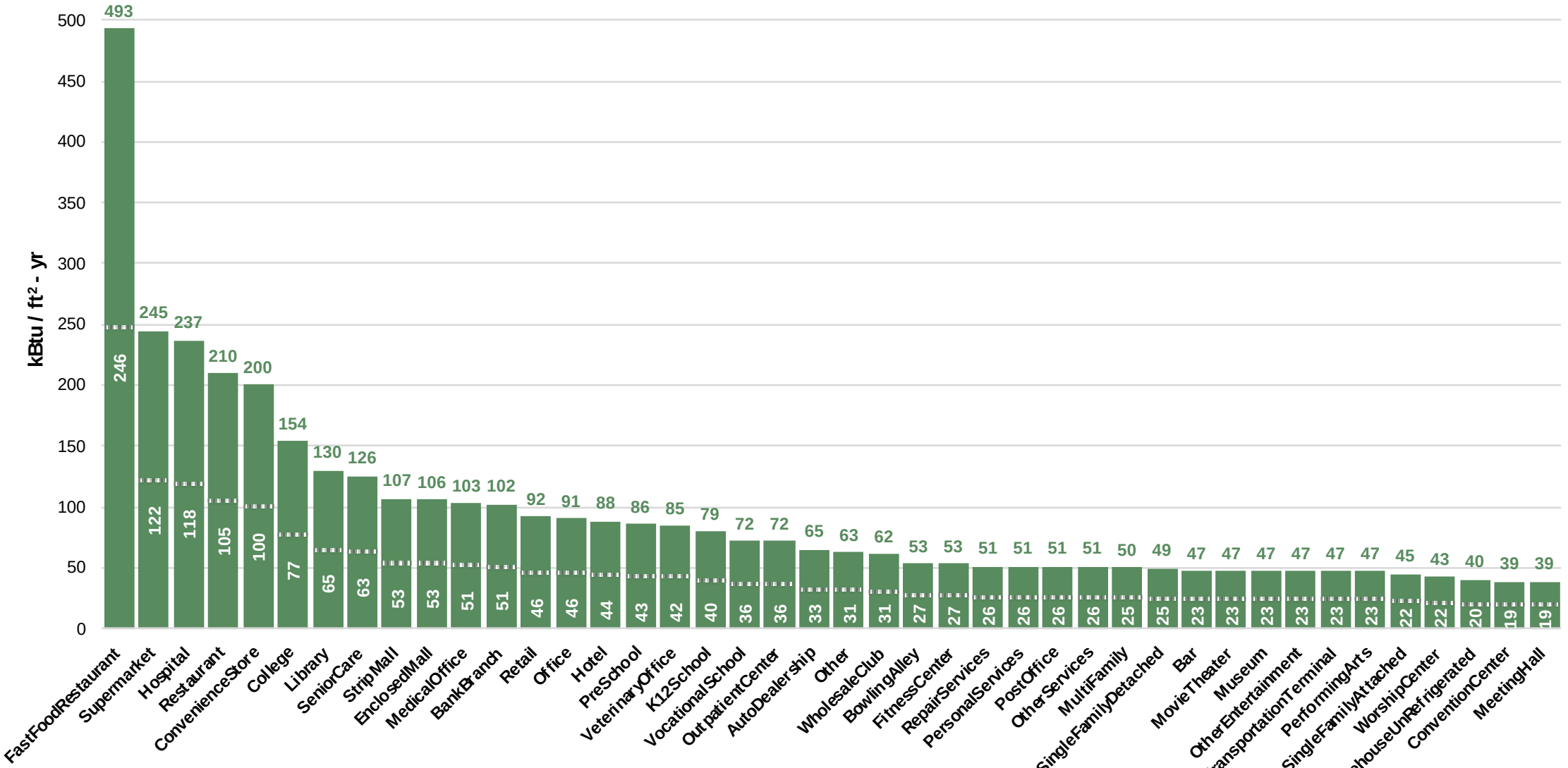
GRAND RAPIDS, MI



BUILDING ENERGY USE SUMMARY

GRAND RAPIDS, MI

Use Type Average EUIs and 2030 District Target EUIs

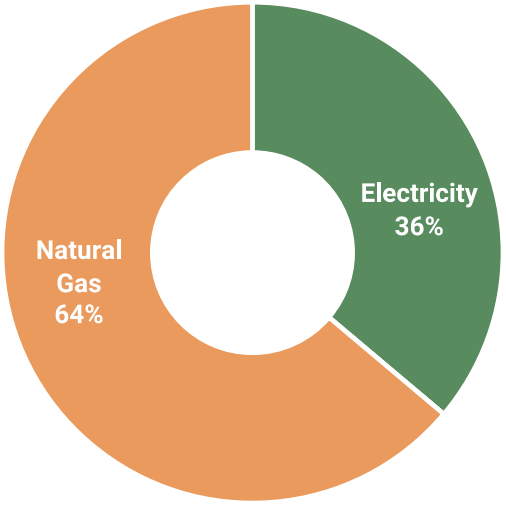


Use Type Average EUI | 2030 District Target EUI

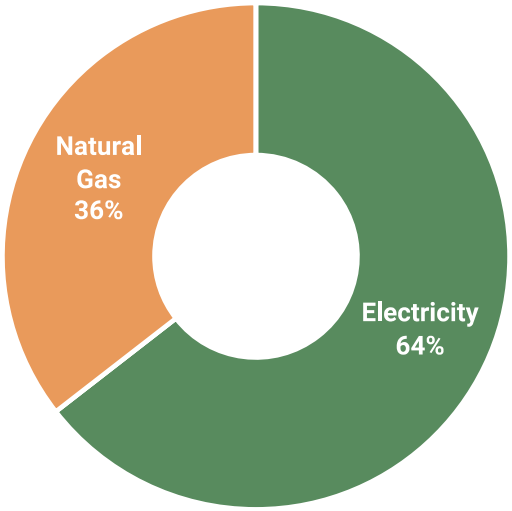
BUILDING ENERGY SOURCE SUMMARY

GRAND RAPIDS, MI

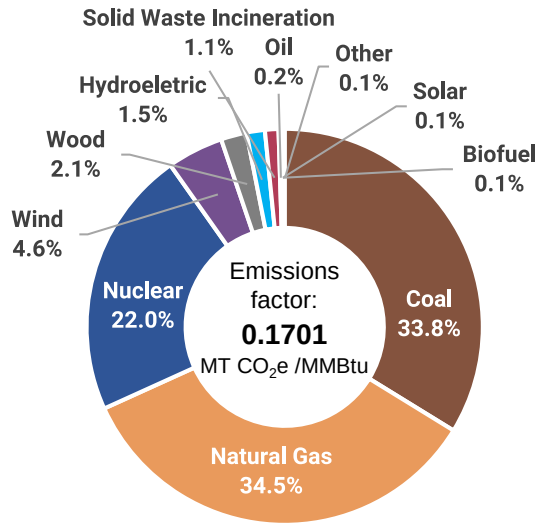
Current Fuel Mix: Energy Consumption



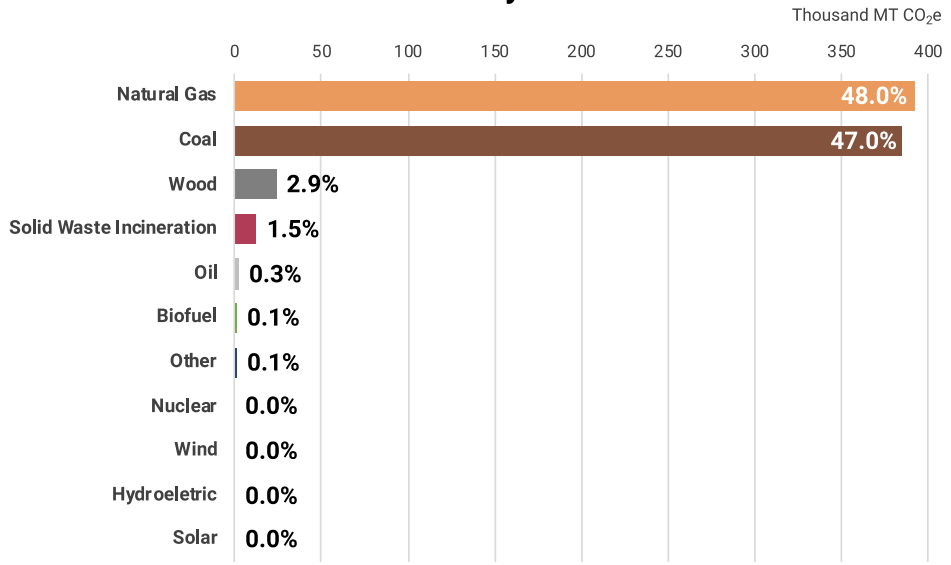
Current GHG Emissions



Current Electricity Grid Fuel Mix



Total Electricity Emissions

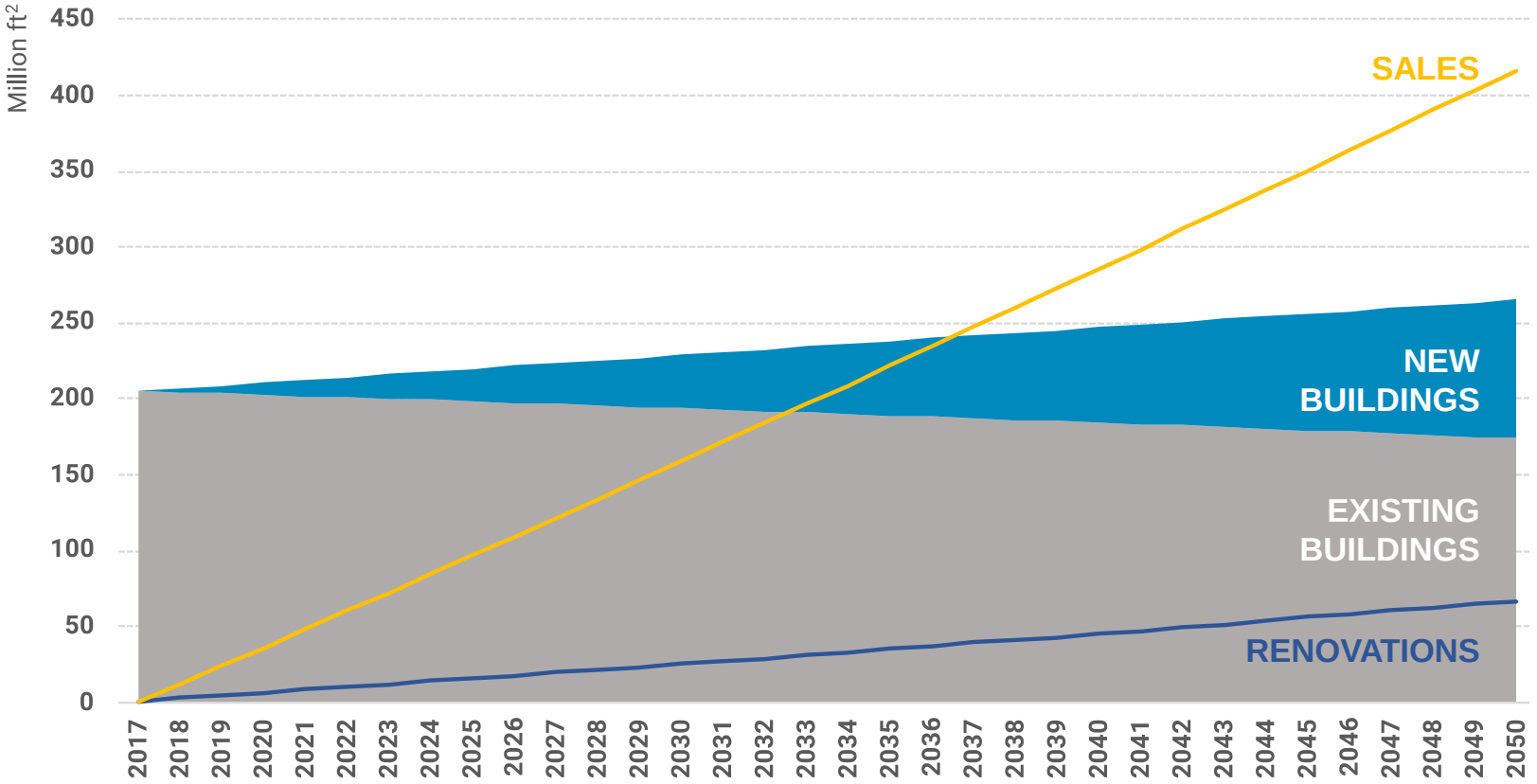


*Emission factor provided by utility (not calculated through aggregation using EPA emissions factors)

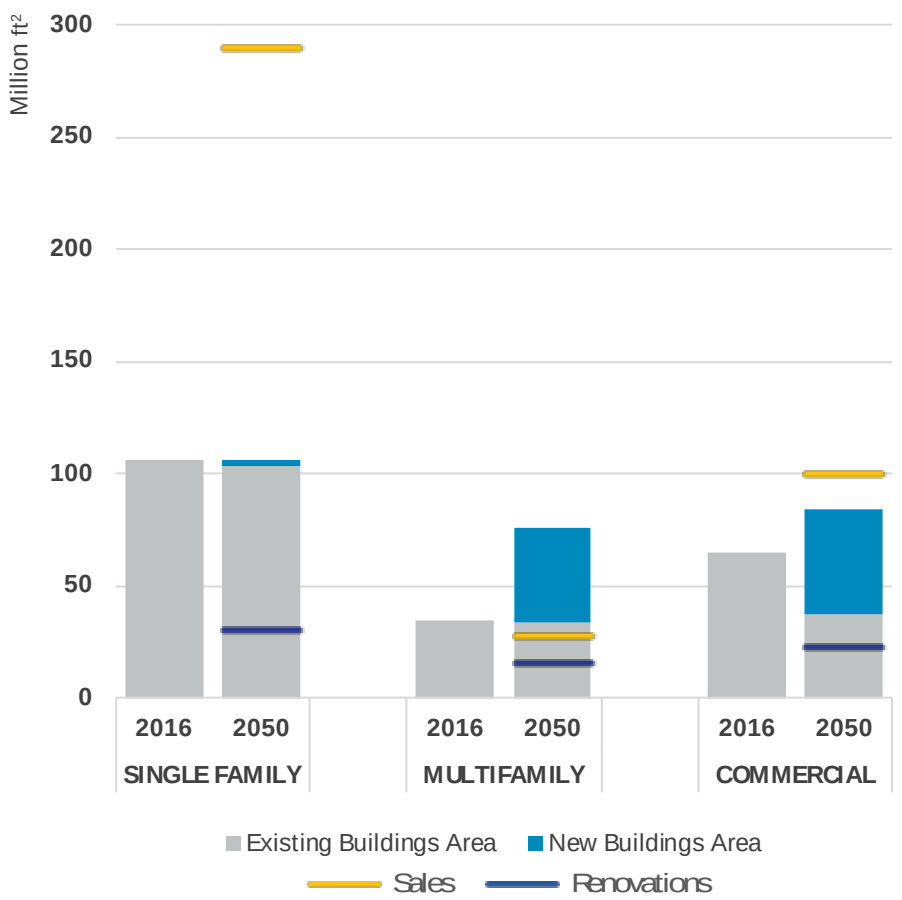
BUILDING AREA PROJECTIONS

GRAND RAPIDS, MI

Building Area Trends



Building Area by Type



BUILDING STOCK INSIGHTS*

GRAND RAPIDS, MI

KEY TAKEAWAYS	POLICY IMPLICATIONS
Single-family residential buildings account for 40% of total building energy use and 39% of emissions.	Energy efficiency upgrades for SFR buildings have potential to significantly decrease emissions.
Electricity supplies 36% of building energy but accounts for 64% of emissions. Electrification policies lead to higher emissions due to dirtiness and volatility of the grid.	Decarbonizing the electric grid, including renewable energy generation and procurement requirements, represents a significant opportunity to achieve emissions reductions.
The 1,114 buildings over 10,000 ft^2 (1.8% of all buildings) account for 41% of current total building energy use and 42% of building sector GHG emissions.	Energy upgrade policies aimed at buildings > 10k ft^2 have the potential for significant emissions reductions in the existing building stock.
Renovation rates are currently projected to affect approximately half of existing buildings by 2050 (and nearly all of existing commercial buildings).	Point of renovation policies for energy upgrades have the potential to affect buildings and significantly decrease emissions.
Sales rates are currently projected to affect more than 100% of single family and commercial buildings by 2050.	Point of sale policies for energy upgrades have the potential to affect buildings and significantly decrease emissions.
Significant commercial building demolition as well as new multifamily growth provides an opportunity for replacement with low or zero emissions new construction.	ZERO Code provides an opportunity to avoid significant emissions in new commercial construction.

Energy upgrades and decarbonization policies include: 1) improvements to the energy efficiency of a building and its systems, including a shift to electric systems that can be powered by renewable energy sources, and/or 2) the generation or procurement of renewable energy.

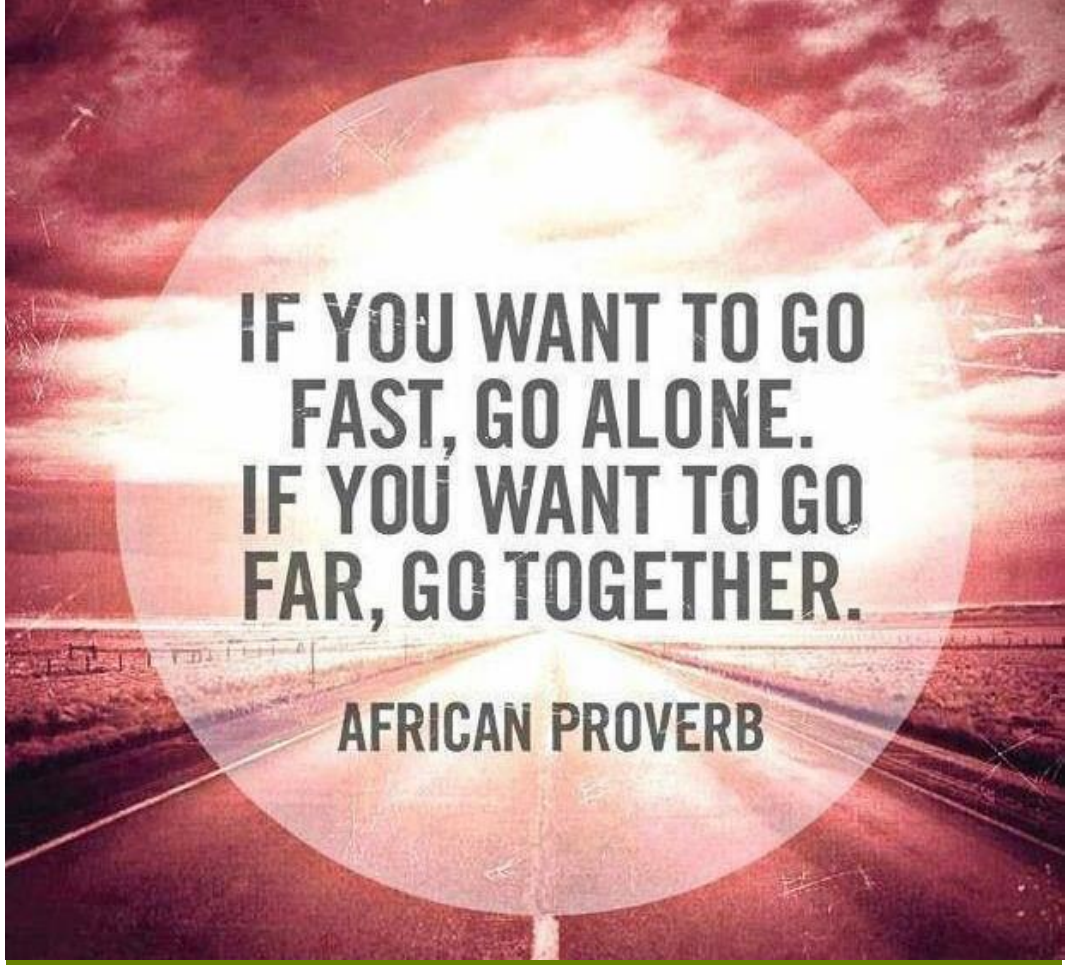
* Heavily dependent on accuracy of assumptions about fuel split, emissions factors, and new construction and sales rates. Subject to change if assumptions are updated.

Community Collaboration on Climate Change: Current Draft Objectives

- Better collaboration amongst existing grassroots environmental organizations
- Equity training and resources for existing grassroots environmental organizations where needed
- Creating awareness, understanding, agency and capacity building within communities of color regarding climate change and providing support to communities of color to identify climate change priorities
- Help facilitate better connections between grassroots environmental organizations and communities of color that support more equitable environmental outcomes

C4: Key Components of Draft Plan

- Equity training for planning team ($2,500)
- Facilitator for 106 hours (total $13,250)
  - Onboarding
  - Research best practices for collaborative models from other cities
  - Prepare and host two five-hour facilitated workshops
  - Create a three-year plan to pilot the C4
- Community participant stipends ($800)
- Venue, transportation, food, childcare costs ($1,500)



Alison Waske Sutter
Sustainability and Performance Management Officer
City of Grand Rapids
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URBAN CORE COLLECTIVE

UNAPOLOGETICALLY SERVING THE GRAND RAPIDS COMMUNITY

URBAN CORE COLLECTIVE

SIX ORGANIZATIONS

A COMMUNITY SUSTAINING AND ADVOCATING FOR ONE ANOTHER TO END SYSTEMIC RACISM.

MISSION

Uplifting historically marginalized communities to a place of greater self sufficiency by unifying communities of color in order to reduce the effects of systemic racism.

VISION

Grand Rapids families and neighborhoods will maximize their full human potential, thus redefining the narrative associated with living in urban communities.

URBAN CORE COLLECTIVE

WE BELIEVE

THAT SUCCESSFUL PEOPLE AND NEIGHBORHOODS OVERCOME EFFECTS OF SYSTEMIC RACISM THROUGH EQUAL ACCESS TO: EDUCATION, ECONOMIC PROSPERITY, HEALTH, POWER & INFLUENCE.

VIEW INFOGRAPHIC
OF OUR STORY

UCC's Role: Thought, Accountability and Strategy Partner

"If you come here to help me you are wasting your time. But if you've come because your liberation is bound up with mine, let us begin."

Lily Walker, Aboriginal Leader

URBAN
CORE
COLLECTIVE

COMMUNITY IS AT OUR CORE

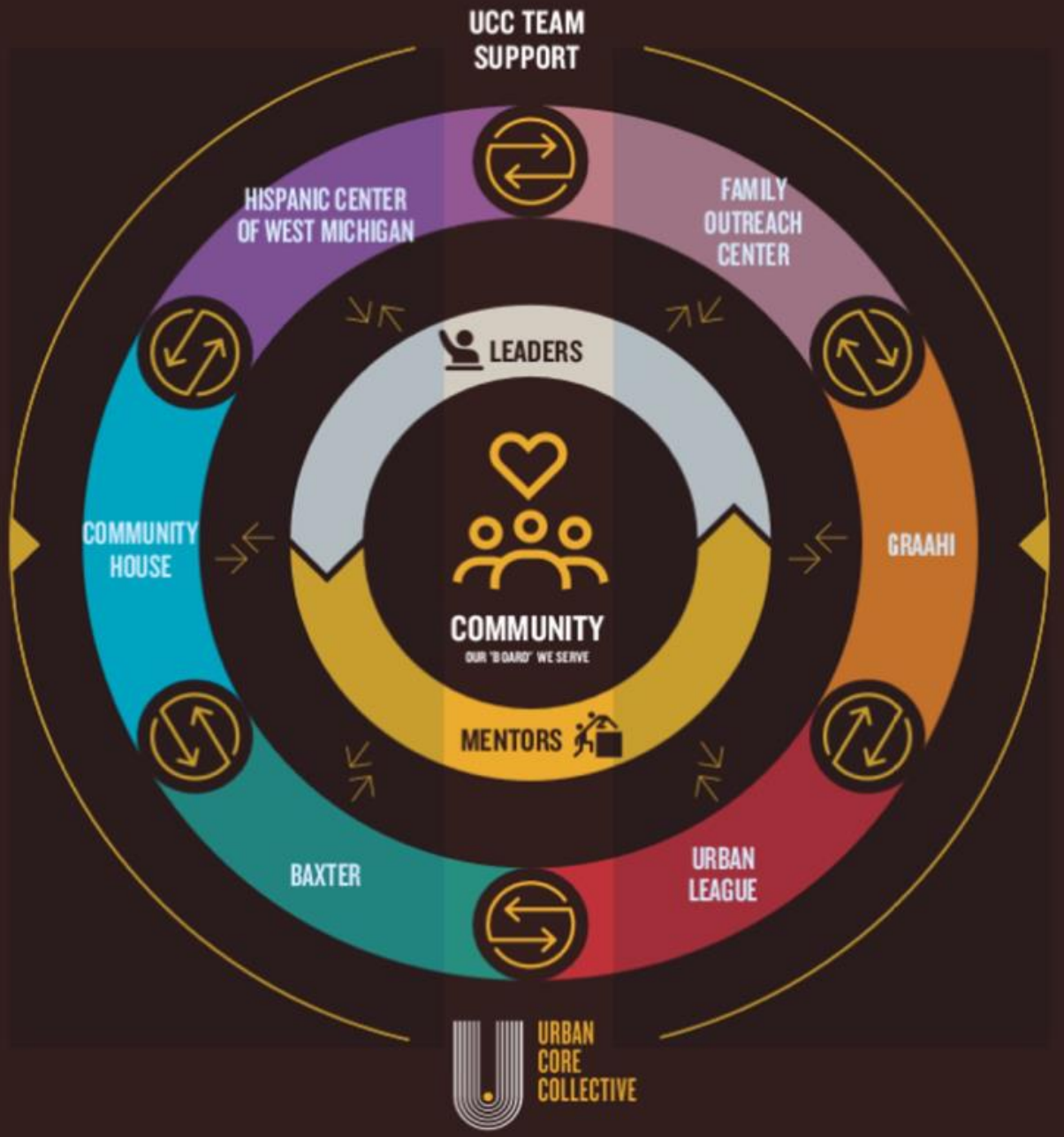
Community being at the center of all we do, almost like our "Board" where we serve and support the needs that are communicated by community but also build relationship with community members.

COMMUNITY ALIGNMENT

Our goal is that among all levels within each organization, communication will happen so that resources can be shared and support can be given from one organization to another, creating sustainability for the organizations.

LEADERSHIP AND MENTORING

Within these processes, leaders are being built and mentored to share in the work that is happening and be at the forefront of initiatives.
Finally, the UCC team as a whole is uplifting and supporting the entirety of this alignment work.



Zero Cities

- 3 year project supporting 11 cities to:
  - Develop policy roadmaps to zero net carbon
  - In the building sector
  - Create replicable model to share with other cities
  - Its community collaborative process
  - Centers on racial equity
- UCC is the City’s Equity Partner
- Urban Sustainability Directors Network

Initial Plan & Shift

- Create a pilot with a cohort of residents
  - Participate in a package of services
  - Track financial, health, energy savings benefits

- Realized this was repeating past approaches
  - Translate/adapt programing created for a different demographic
  - Us making assumptions about what residents need

- SHIFT to genuine engagement to assess existing programs
  - Relevance, barriers, gaps, priorities

Two Main Goals

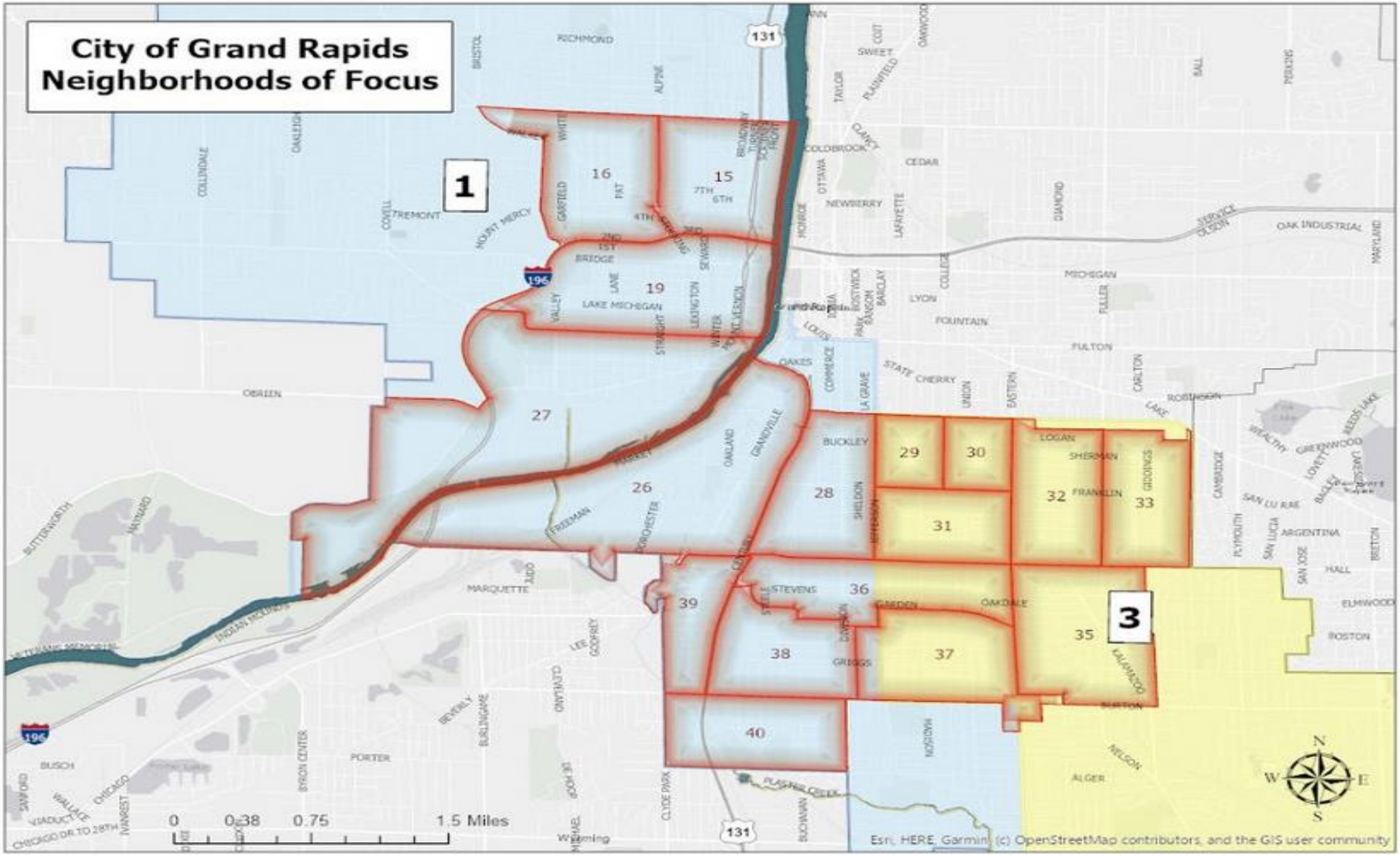
The ROADMAPS should prioritize two co-equal goals:

*Equity Assessment Tool

- Increased racial equity
- Decreased carbon emissions from the building sector

Start by Listening

- 6 mo. plan to listen to resident experience
  - Surveys (100 +)
  - 1:1 interviews (20)
  - Group Conversations (4/10)
- Work with trusted partners
  - As a way to reach POC in neighborhood of focus
  - Not exclusive to POC, includes homeowners and tenants
  - To host meetings, administer surveys, provide input on questions
- Residents as Community Consultants
  - No extraction without compensation
  - Consultants for capacity also from community (surveys, child care, Analisis


City of Grand Rapids
Neighborhoods of Focus
1
3
16
15
19
27
26
28
29
30
31
32
33
36
39
38
37
35
40
0
0.38
0.75
1.5 Miles
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Appendix I: List of Top 25% Michigan Census Tracts Ranked by Environmental Justice Score

Rank	Tract	EJ Score	Percentile	County
1	0039	93.994	99.9%	KENT
2	0002	91.947	99.9%	KALAMAZOO
3	0003	90.173	99.9%	KALAMAZOO
4	0038	89.501	99.8%	KENT
5	0040	87.740	99.8%	KENT
6	0036	87.633	99.8%	KENT
7	0026	87.428	99.7%	KENT
8	5061	87.208	99.7%	WAYNE
9	5055	86.924	99.7%	WAYNE
10	5162	86.695	99.6%	WAYNE
11	0028	86.465	99.6%	KENT
12	5051	85.868	99.5%	WAYNE
13	5189	85.295	99.5%	WAYNE
14	5050	84.768	99.5%	WAYNE
15	0001	84.763	99.4%	KALAMAZOO
16	5032	84.749	99.4%	WAYNE
17	5238	84.334	99.4%	WAYNE
18	0037	84.157	99.3%	KENT
19	2638	83.977	99.3%	MACOMB
20	5159	83.727	99.3%	WAYNE

Rank	Tract	EJ Score	Percentile	County
51	5163	78.362	98.1%	WAYNE
52	5741	78.326	98.1%	WAYNE
53	5062	78.265	98.1%	WAYNE
54	5233	78.264	98.0%	WAYNE
55	5225	77.992	98.0%	WAYNE
56	5204	77.974	97.9%	WAYNE
57	5521	77.874	97.9%	WAYNE
58	5333	77.874	97.9%	WAYNE
59	5044	77.795	97.8%	WAYNE
60	0031	77.774	97.8%	KENT
61	2683	77.735	97.8%	MACOMB
62	0019	77.707	97.7%	KENT
63	5081	77.697	97.7%	WAYNE
64	5255	77.574	97.7%	WAYNE
65	5075	77.407	97.6%	WAYNE
66	5065	77.389	97.6%	WAYNE
67	5048	77.253	97.5%	WAYNE
68	5004	77.119	97.5%	WAYNE
69	5119	77.059	97.5%	WAYNE
70	5121	76.981	97.4%	WAYNE

Target Insights

- What residents know
- Feedback on existing programs
  - Create “Resource Map”
  - Categorize by type and qualifications
- Identify barriers
- Identify gaps in services
- What ideas do they have
- How could providers improve services
- What would increase participation
- Who are trusted partners

Recommendations

- Final report and recommendations
  - 4th listening session will be to confirm findings
  - Used to create recommendations and report to the national partner
  - To be shared with utilities and providers
- Equity assessment tool to be adapted for local use. Race forward

  ****Still deciding on this**

EWR Low-Income Workgroup

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Healthy Homes
Coalition of West Michigan

Review

A Section 508–conformant HTML version of this article is available at http://dx.doi.org/10.1289/ehp.1307922.

Indoor Environmental Exposures and Exacerbation of Asthma: An Update to the 2000 Review by the Institute of Medicine

Watcharoot Kanchongkittiphon,[1,2,3] Mark J. Mendell,[4,5*] Jonathan M. Gaffin,[1,2] Grace Wang,[6] and Wanda Phipatanakul[1,2]*

[1]Division of Allergy and Immunology, Boston Children's Hospital, Boston, Massachusetts, USA; [2]Harvard Medical School, Boston, Massachusetts, USA; [3]Department of Pediatrics, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; [4]Indoor Air Quality Program, California Department of Public Health, Richmond, California, USA; [5]Indoor Environment Group, Lawrence Berkeley National Laboratory, Berkeley, California, USA; [6]American Institutes for Research, San Mateo, California, USA.

*These authors contributed equally to this work.

Background: Previous research has found relationships between specific indoor environmental exposures and exacerbation of asthma.

Objectives: In this review we provide an updated summary of knowledge from the scientific literature on indoor exposures and exacerbation of asthma.

Methods: Peer-reviewed articles published from 2000 to 2013 on indoor exposures and exacerbation of asthma were identified through PubMed, from reference lists, and from authors' files. Articles that focused on modifiable indoor exposures in relation to frequency or severity of exacerbation of asthma were selected for review. Research findings were reviewed and summarized with consideration of the strength of the evidence.

Results: Sixty-nine eligible articles were included. Major changed conclusions include a causal relationship with exacerbation for indoor dampness or dampness-related agents (in children); associations with exacerbation for dampness or dampness-related agents (in adults), endotoxin, and environmental tobacco smoke (in preschool children); and limited or suggestive evidence for association with exacerbation for indoor culturable *Penicillium* or total fungi, nitrogen dioxide, rodents (nonoccupational), feather/down pillows (protective relative to synthetic bedding), and (regardless of specific sensitization) dust mite, cockroach, dog, and dampness-related agents.

Discussion: This review, incorporating evidence reported since 2000, increases the strength of evidence linking many indoor factors to the exacerbation of asthma. Conclusions should be considered provisional until all available evidence is examined more thoroughly.

Conclusion: Multiple indoor exposures, especially dampness-related agents, merit increased attention to prevent exacerbation of asthma, possibly even in nonsensitized individuals. Additional research to establish causality and evaluate interventions is needed for these and other indoor exposures.

Citation: Kanchongkittiphon W, Mendell MJ, Gaffin JM, Wang G, Phipatanakul W. 2015. Indoor environmental exposures and exacerbation of asthma: an update to the 2000 review by the Institute of Medicine. Environ Health Perspect 123:6–20; http://dx.doi.org/10.1289/ehp.1307922

control or prevention, airway inflammation assessed by fraction of exhaled nitric oxide (FeNO), and asthma-related quality of life.

Potentially modifiable biological and chemical exposures resulting from indoor sources were considered for inclusion as potential causes of asthma morbidity. Infectious agents and outdoor-generated pollutants that penetrate buildings were excluded. Studies on new onset of asthma, asthma prevalence, or experimental biologic markers of asthma were excluded.

Only studies of human health effects were included. Eligible study designs were controlled (experimental) exposure studies, environmental intervention studies, and a variety of observational designs: prospective or retrospective (longitudinal) cohort, case–control, and cross-sectional. Case studies and case series were ineligible. Detailed inclusion and exclusion criteria are described in the Supplemental Material, "Study inclusion criteria."

Literature Search

PubMed searches were performed in May and August 2011 and updated in August 2013.

Healthy Homes
Coalition of West Michigan

Cause the Development of Asthma

Institute of Medicine on Asthma

Dust Mites – Sufficient Evidence: Causal

ETS – Sufficient Evidence: Association

Cockroaches – Limited Evidence: Association

Healthy Homes
Coalition of West Michigan

Exacerbates Asthma

Institute of Medicine on Asthma

Sufficient Evidence of a Causal Relationship

Cats
Cockroaches
House dust mites
ETS (preschool)

Healthy Homes
Coalition of West Michigan

Exacerbates Asthma

Institute of Medicine on Asthma

Sufficient Evidence of an Association

Dogs

Fungi & Molds

Nitrogen Oxides

Rhinovirus

Healthy Homes
Coalition of West Michigan

Exacerbates Asthma

Institute of Medicine on Asthma

Limited Evidence of an Association

- **Domestic Birds**
- **ETS** (older)
- **Formaldehyde**
- **Fragrances**
- **Respiratory Syncytial Virus (RSV)**

Healthy Homes
Coalition of West Michigan

Pathway to Health Care Investments for Asthma

Philanthropy Fatigue (2013)

First Attempt at Payer Reimbursement (2013)

Hospital Community Benefit Investment (began 2014)

Investigate Pay for Success (2015-2017)

1 Intake and enrollment

Identify eligible patients, call to enroll into the program.

2 Initial Home Visit

Asthma Educator/CHW: ACT, medication reconciliation, education, supplies

Assessor: Comprehensive environmental assessment and Scope of Work

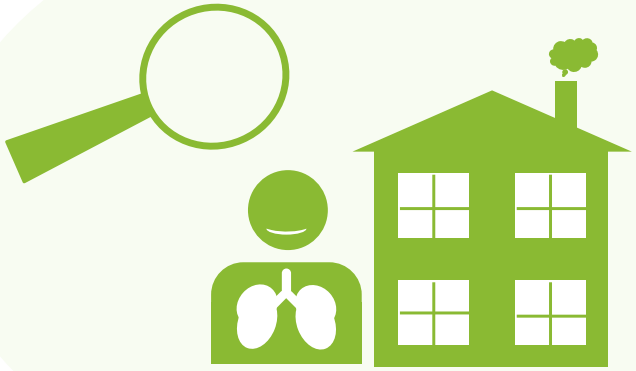
The **community health worker** is a vital part of this model

3 Asthma education and home repairs

Fix asthma triggers: Pests, moisture and mold, ventilation, carpet removal, etc.

Manage asthma:
- Home visits
- Follow-up calls
- Coordination with medical providers

4 Evaluation of outcomes



Green & Healthy Homes Initiative®

Healthy Homes
Coalition of West Michigan

Pathway to Health Care Investments for Asthma

Philanthropy Fatigue (2013)

First Attempt at Payer Reimbursement (2013)

Hospital Community Benefit Investment (began 2014)

Investigate Pay for Success (2015-2017)

Priority Health (began 2018) – linked to Medicaid and SDoH

Healthy Homes
Coalition of West Michigan

Five Lessons Learned

- Get projects on the ground ASAP
- Speak to value broadly
- May need to subsidize / braid funding
- Know your limitations
- “How can we help?”

EWR Low-Income Workgroup

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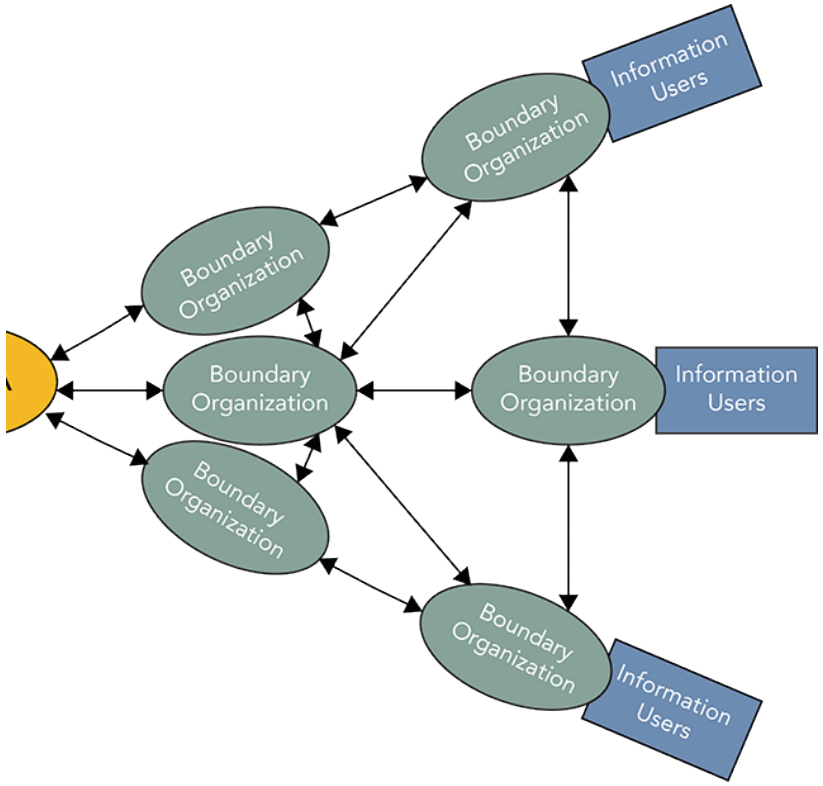
Beyond Subsidy: Boundary Organization Approach to Promote Utility Assistance Action

WEST MICHIGAN SUSTAINABLE BUSINESS FORUM

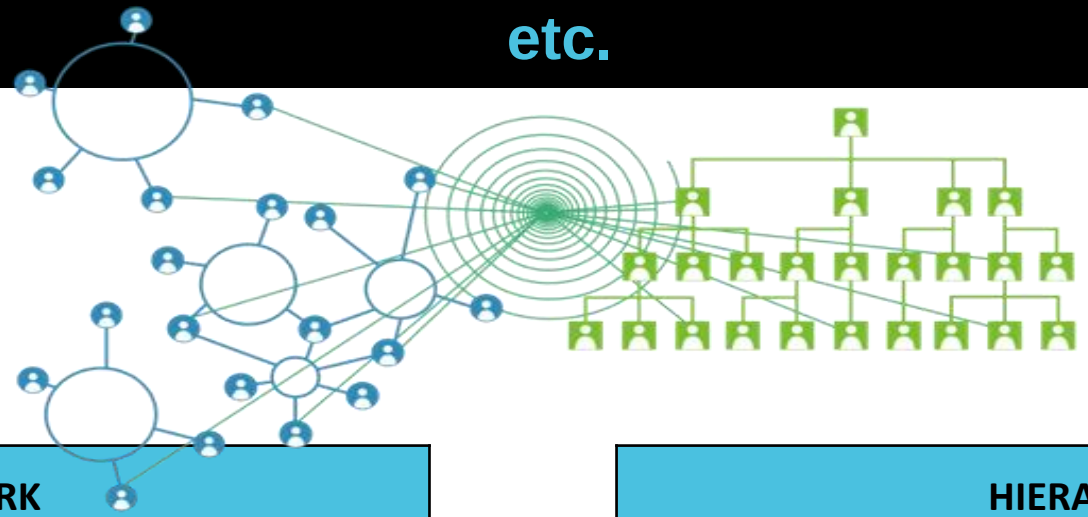
West Michigan Sustainable Business Forum promotes business practices that demonstrate environmental stewardship, economic vitality, and social responsibility through education and collaboration.

Boundary Organization



- Meaningful
- Mutually beneficial
- Flow of
  - Knowledge
  - Expertise
  - Resources
- Enabled by
  - Translation
  - Co-production
  - Accountability

Each Network/Operating System Has Different Operating Rules, Priorities, Language etc.



ADAPTIVE NETWORK

Intrinsic motivation to align with internal values/purpose

Clusters, Community structure, relationships

Boundary crossing connectivity

Co-created change, leadership as a system

Applied learning focus

Stories, social Influence, spaces/convening/curating

Present to future focus

Dynamic, emergence, transient, multiple

Aligned via Shared Purpose

HIERARCHICAL NETWORK

Extrinsic motivation to align with mission, vision & goals

Authority structure, transactions

Division and hierarchy

Top-down change, linear chain of command

Execution focus

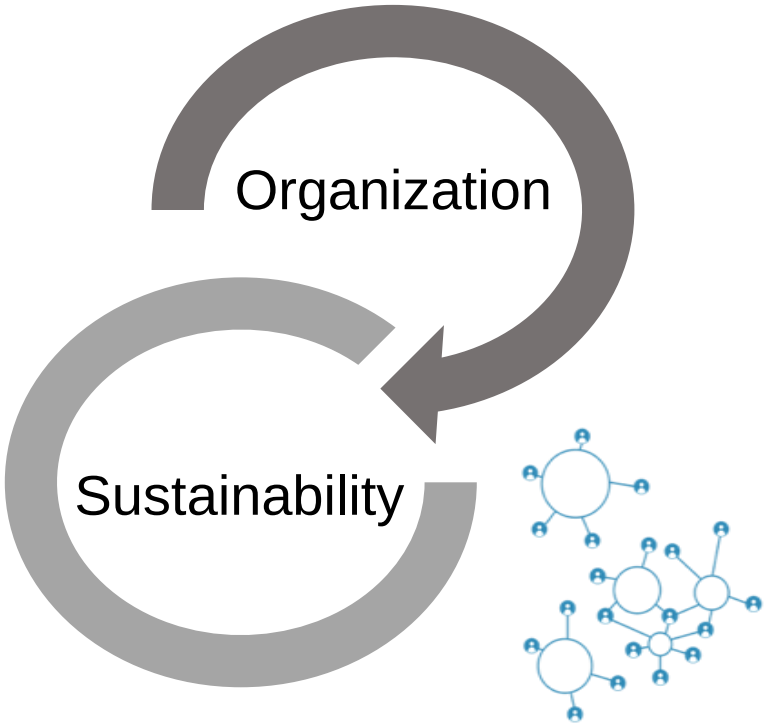
Strategy, metrics, reporting

Past to future focus

Structure, routine, permanent, uniform

How Does Each Network Relate to Sustainability?

Adaptive emphasis: What can the organization do for sustainability?



Hierarchical emphasis: What can sustainability do for the organization?

Beyond Subsidy

- Introduce sustainability practitioners and energy professionals to the dynamics of energy assistance
- Facilitate connections between assistance and weatherization agencies and energy innovation field
- Develop ideas that leverage energy innovation and industry expertise to improve utility access without bill subsidy
- Test feasibility and interest for ongoing partnerships, projects or initiatives

WEST MICHIGAN SUSTAINABLE BUSINESS FORUM

Event

- 90 people
- 21 different organizations
  - 6 utilities
- 60 minutes of education
- 45 minutes of discussion

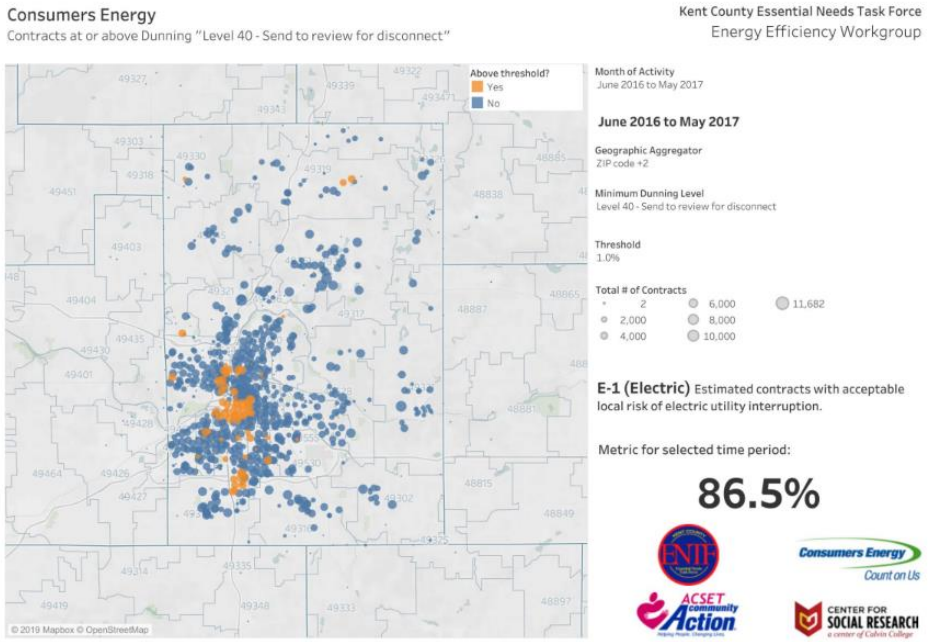


Table Topics/Solution Tracks

1. Public Policy
2. Alternative Funding
3. Technology Solutions (demand)- eg. weatherization
4. Technology Solutions (supply)- eg. renewables, microgrids
5. Collaboration & Coordination
6. Education

WEST MICHIGAN SUSTAINABLE BUSINESS FORUM

Question 1

What challenges do we need to anticipate through the process of addressing utility assistance needs through alternative measures?

WEST MICHIGAN SUSTAINABLE BUSINESS FORUM

130 Homes Scored in GR. Findings

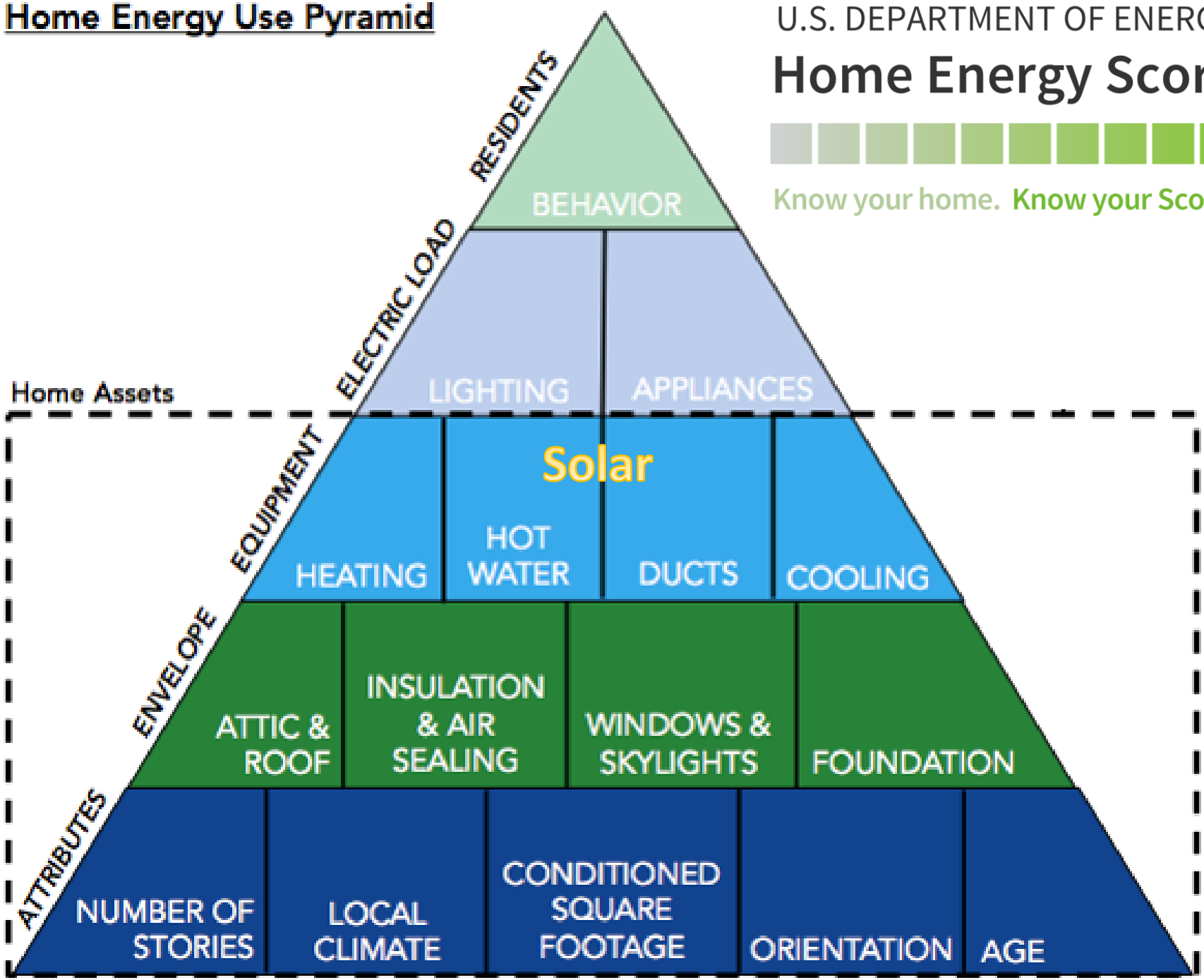
GreenHome INSTITUTE

Home Energy Use Pyramid

U.S. DEPARTMENT OF ENERGY

Home Energy Score

Know your home. **Know your Score.**

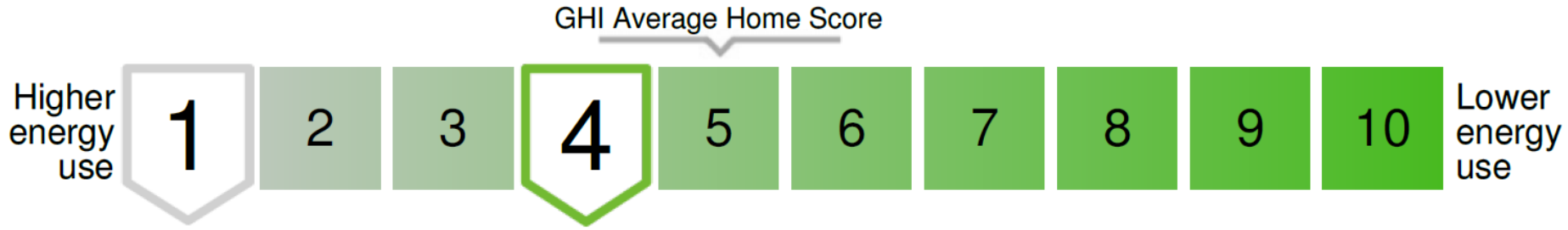


GreenHome Inspection Report

- **Ventilation & Filtration details**
- **CO risk & Detectors**
- **Water flow rates & leaks**
- **Moisture / Mold issues**
- **Solar opportunity**
- **Lead report**
- **Asbestos present?**
- **Radon tests**
- **Gas leaks**
- **Gutters**

Average Score 3 of 10

CONDITIONED FLOOR AREA: 2,448 FT^2
ASSESSMENT DATE: OCT 04, 2016



Recommended Improvements

REPAIR NOW. These improvements will save you money, conserve energy, and improve your comfort.

- Air tightness: Have a professional seal the gaps and cracks that leak air into your home to save **$163** / year
- Ducts 1: Add insulation around ducts in unconditioned spaces to at least R-6 to save **$63** / year
- Ducts 1: Have your ducts professionally sealed to reduce leakage to save **$189** / year

REPLACE LATER. These improvements will help you save energy when it's time to replace or upgrade.

- Roof 1: Pick materials that have high solar reflectance (a "cool roof") and an ENERGY STAR label to save **$7** / year
- Windows: Pick ones with an ENERGY STAR label to save **$334** / year
- Furnace 1: Pick one with an ENERGY STAR label to save **$539** / year
- Central Air 1: Pick one with an ENERGY STAR label to save **$183** / year
- Water heater: Pick one with an ENERGY STAR label to save **$41** / year

After DOE upgrades – **6** of 10

Before/year
8,300 kwhs
1,500 therms

After / year

7,400 kwhs

900 therms

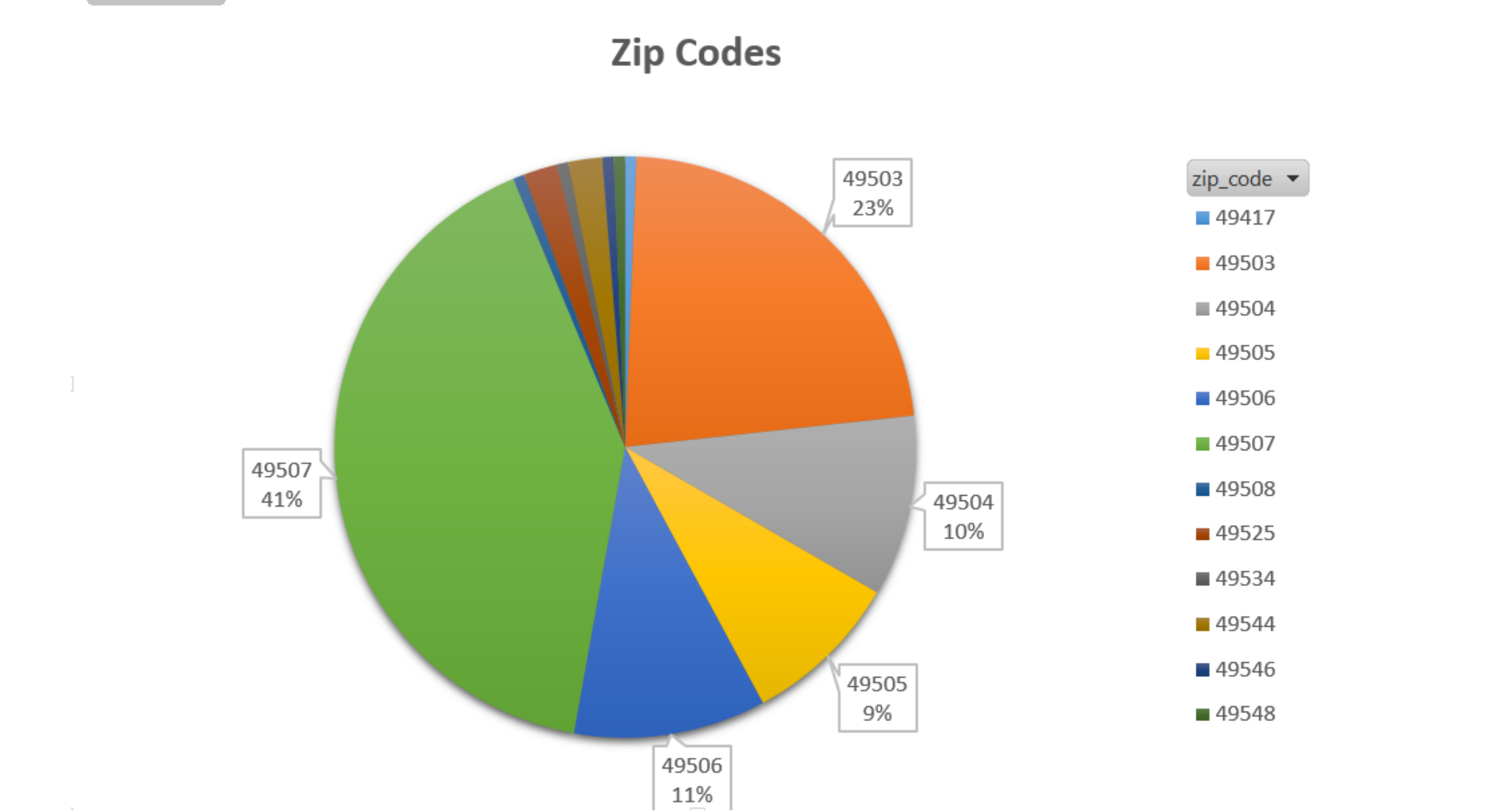
Before / year
30,000 pounds
of Carbon

After / year
20,000 pounds
of Carbon

Before / year
$2,550 - Bill

After / year

$1,900 - Bill


Zip Codes
49503
23%
49504
10%
49505
9%
49506
11%
49507
41%
zip_code
49417
49503
49504
49505
49506
49507
49508
49525
49534
49544
49546
49548

Averages for GR Homes

- 103 years old
- Square Feet: 1732
- Air Leakage 4508 CFM @ 50
- Heating efficiency 81% (naturally drafting)
- .61 Water Heaters (naturally drafting)
- Window u value .29
- Only 20% of homes have some sealed ducts
- 80% of rimband joists are not insulated

Other green findings Avg.

- Gas leaks found in 20%
- 15% with back drafting issues
- 15% knob and tube wiring
- 25% moisture issues in the basement
- 80% missing or improperly installed gutters
- 50% no CO detectors not enough
- 60% missing or improper bath fan ventilation
- 65% Hood range recirculates or is missing
- 30% Low filtration rating on furnace
- 45% High flow water devices & 80% high flow toilets

Next Steps

- Continue to audit more homes and get more details on GR features along with challenges and opportunities
- Find funding resources to help moves forward
- Breakdown barriers between silo's of funding resources
- Re score – Re audit and verify savings and carbon reductions

GreenHome INSTITUTE