

Gamification for Improved Community Sustainability Action

REBUILD Conference

Lamees Mubaslat AIA, LEED AP BD+C, Dayton Regional Green
Thomas Blurton, Thomas Blurton Engineering
Meg Maloney, City of Dayton





ipcc
INTERGOVERNMENTAL PANEL ON climate change



Global Warming of 1.5 °C

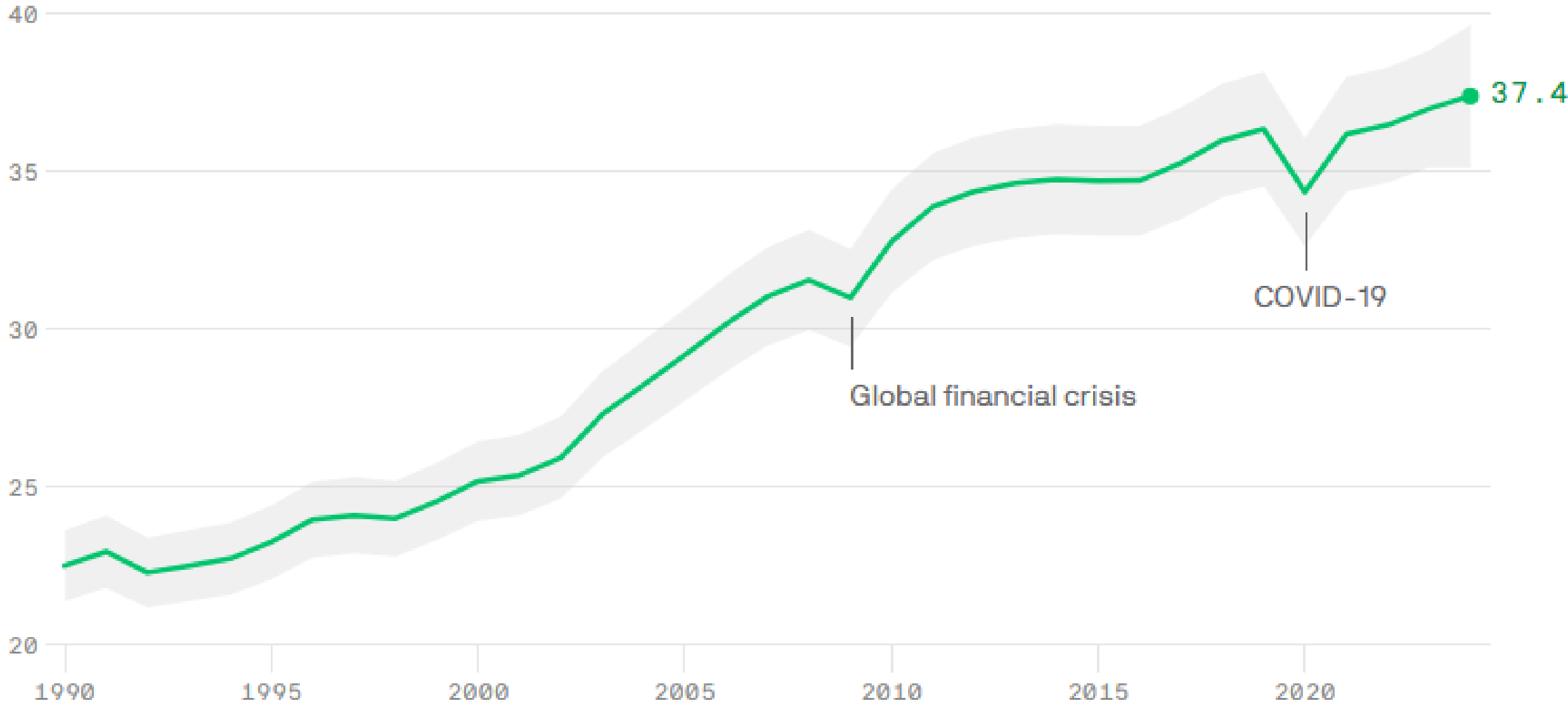
An IPCC special report on the impacts of global warming of 1.5 °C above pre-Industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

CLIMATE CRISIS IPCC REPORT

- “We have 12 years to limit climate change catastrophe”

Global fossil CO2 emissions

Annually, in gigatonnes; 1990 to 2024 (projected)



CRISIS CONDITIONS BY 2040

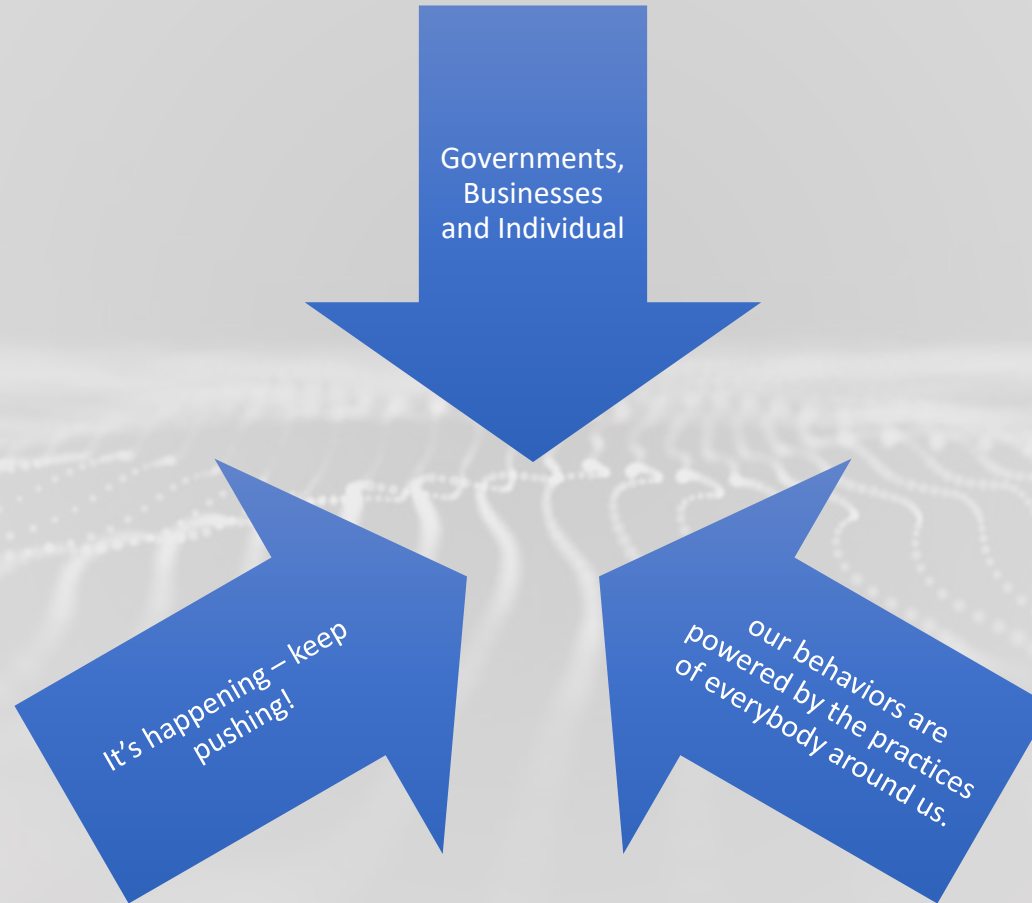
- Intolerable heatwaves
- Entire nations uninhabitable
- Food disruptions on multiple continents at the same time



A man wearing a grey beanie, a light grey long-sleeved shirt, and blue overalls is sitting on a thick, moss-covered tree branch. He is holding a long, dark, curved object, possibly a pipe or a tool, in his hands. The background shows a scenic landscape with rolling hills, a body of water, and a small town under a soft, pinkish-orange sky, suggesting a sunset or sunrise. The text "Do they just not care???" is overlaid in white, sans-serif font across the middle of the image.

Do they just not care????

Change at all Levels!



Sponge City - Shanghai

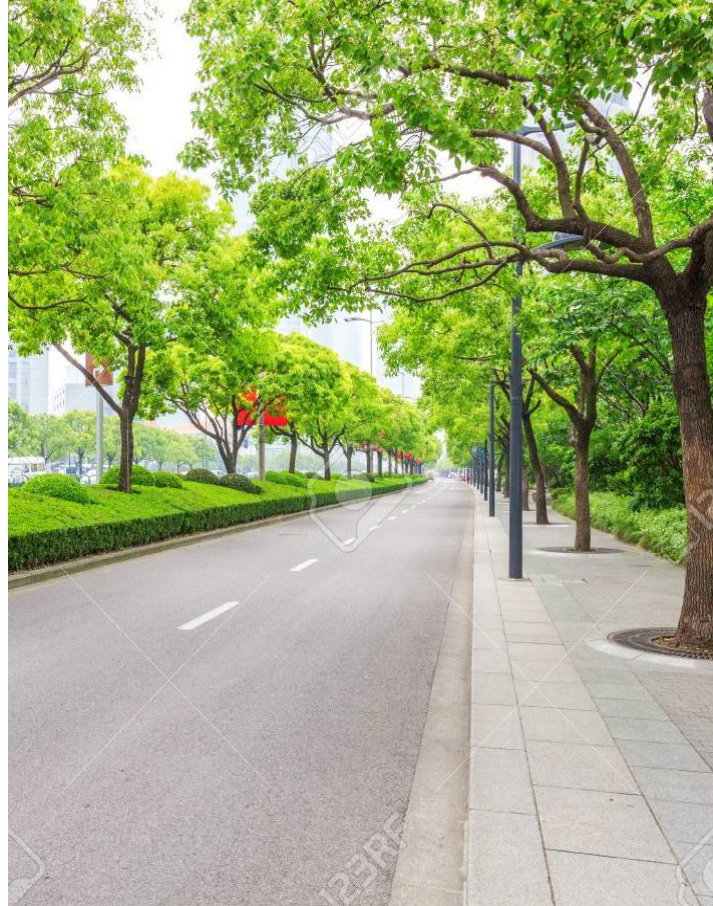
- Stop fighting the water!
- Constructed wetlands, native grasses, ponds, terraced bamboo with zigzagged wooden pathways
- Slow floodwaters and give them room to spread up.
- 200 years of conventional infrastructure did not work
- Recharge local aquifers



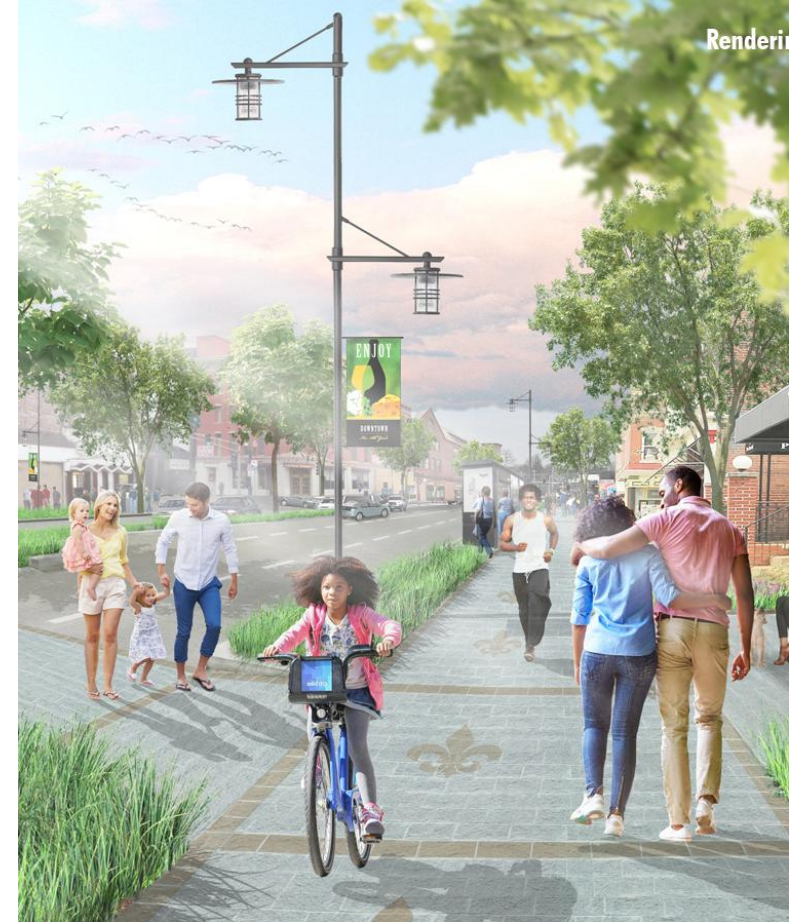
Design Better, Build Healthier



Daylighting
Saves energy, Disinfectant,
Mood Enhancer



Shade and Trees



Walkable Cities

1-Pluralistic Ignorance

People mistakenly think others have different beliefs, values, or behaviors than they do.

Realizing: oh, wait a minute, I'm not the only one that thinks this way!





False Perception of Climate Policy Opposition

The majority of Americans underestimate the prevalence of support for major climate change mitigation policies and climate concern:

- 66–80% Americans support these policies
 - Americans estimate the prevalence to only be between 37–43% on average.
 - Supporters of climate policies outnumber opponents two to one
-

Policy	Actual support (%)	Perceived support (%)
Carbon Tax	67	36.6
Siting RE	80	43.4
100% RE	66	39.5
GND	66	37.9

Why Engagement is Hard



SMALL BUSINESSES &
ORGANIZATIONS OFTEN LACK
RESOURCES

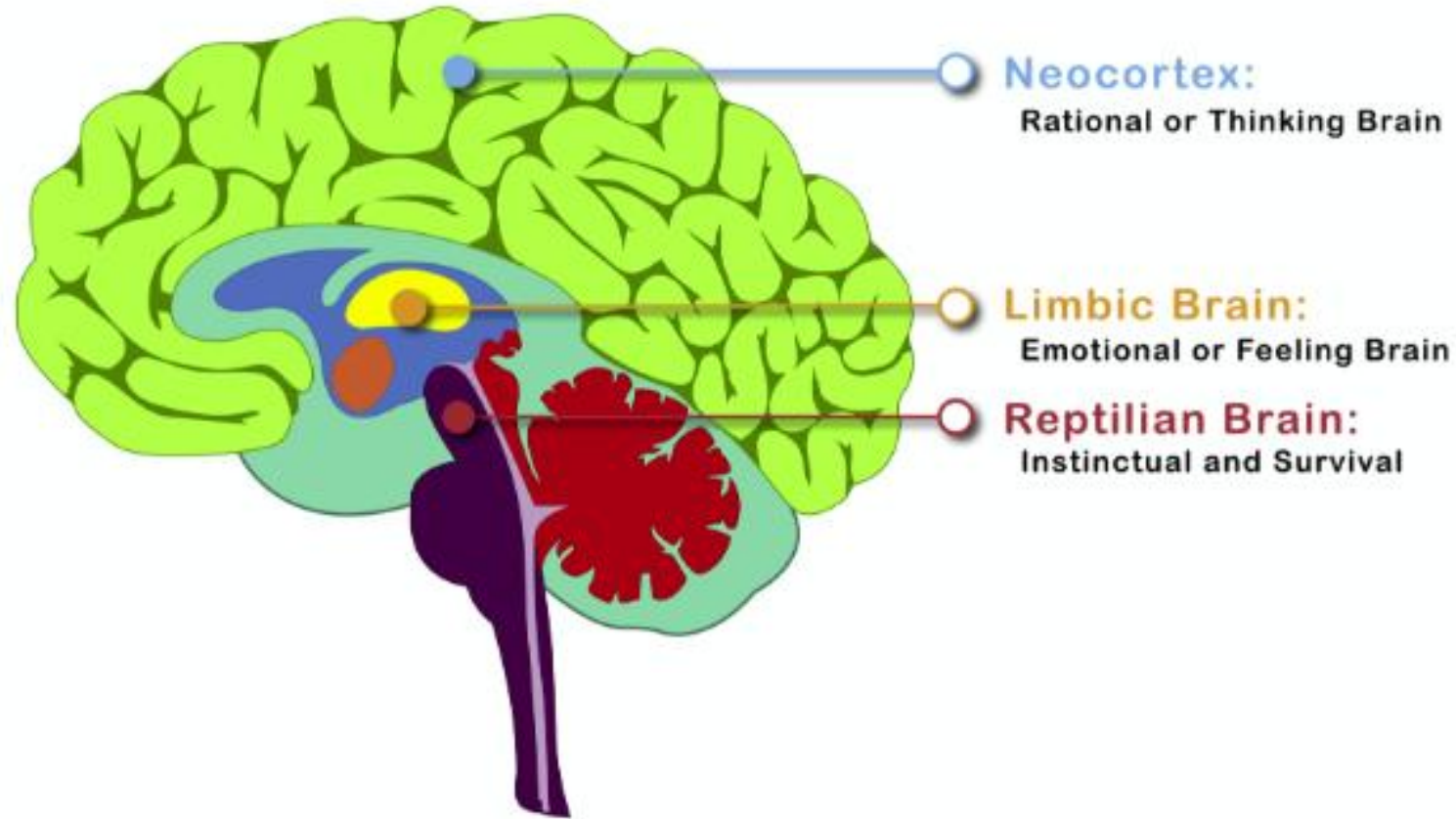


COMPLEX DATA AND UNCLEAR
METRICS DISCOURAGE ACTION



BEHAVIOR CHANGE REQUIRES
EMOTIONAL CONNECTION, NOT
JUST MANDATES

Why Climate Facts Don't Trigger Urgency



The rational brain understands climate change. The emotional brain doesn't feel it as immediate danger

To Spark Real Action, Reach the Emotional Brain



We act when it connects to who we are and who we're with:

- Projects succeed when people feel ownership and motivation.
- Employees act when change connects to identity and belonging.

Logic builds the plan.
Emotion makes people act.



Empowered Action
Fostered Engagement
Kept it REAL

Fostered Engagement

Kept it REAL

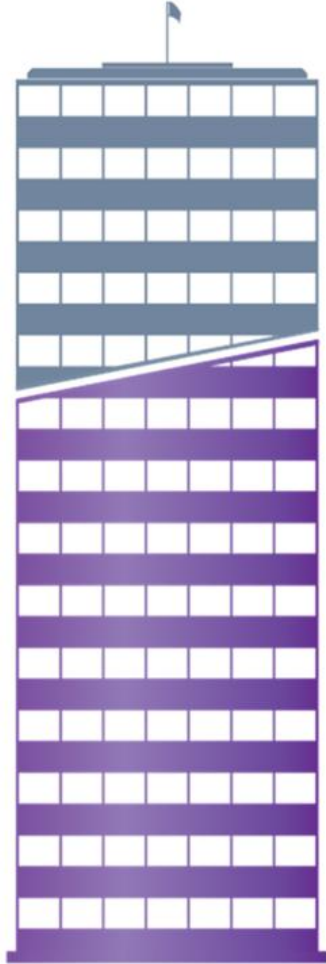
Keep it **R.E.A.L.**

- Real people
- Everyday needs
- Actualizable vision
- Leverageable actions





WHY CERTIFY?



30%

Our buildings used inefficiently!

60%

More waste than in the 60'S!



Green Checklist

Mandatory		Energy		Waste & Resources		Water		Sustainable Sites		Healthy & Engaged	
12	Eliminate Bottled Water										
13	Reuse Rinse Water										
14	Re-Use Area										
15	Reduce Packaging										
16	No Styrofoam										
17	Green Catering										

Minimum Requirements Complete!



230
POINTS


13 of 30 Required
28 Acheived

Remember, update your selection
for more points throughout the
year!



2016 Bring Your Green Challenge

RESOURCE TRACKING PLATFORM



RESOURCE TRACKING | MONTGOMERY COUNTY

451 WEST THIRD STREET ▾

Electric

Gas

Waste

Water

Portfolio

286 PTS ▾

Enter your electric use, upload your electric files to remain organized and view your progress!

Don't forget to fill in your meter(s) properties and identify the primary use of this facility to enable an electric analysis.

Fostering Engagement

Group Identity – We act when we feel part of something bigger

Imitation – Seeing others act inspires us to follow

Progress & Goals – Tracking progress makes change addictive

Social Comparison – Leaderboards motivate friendly competition

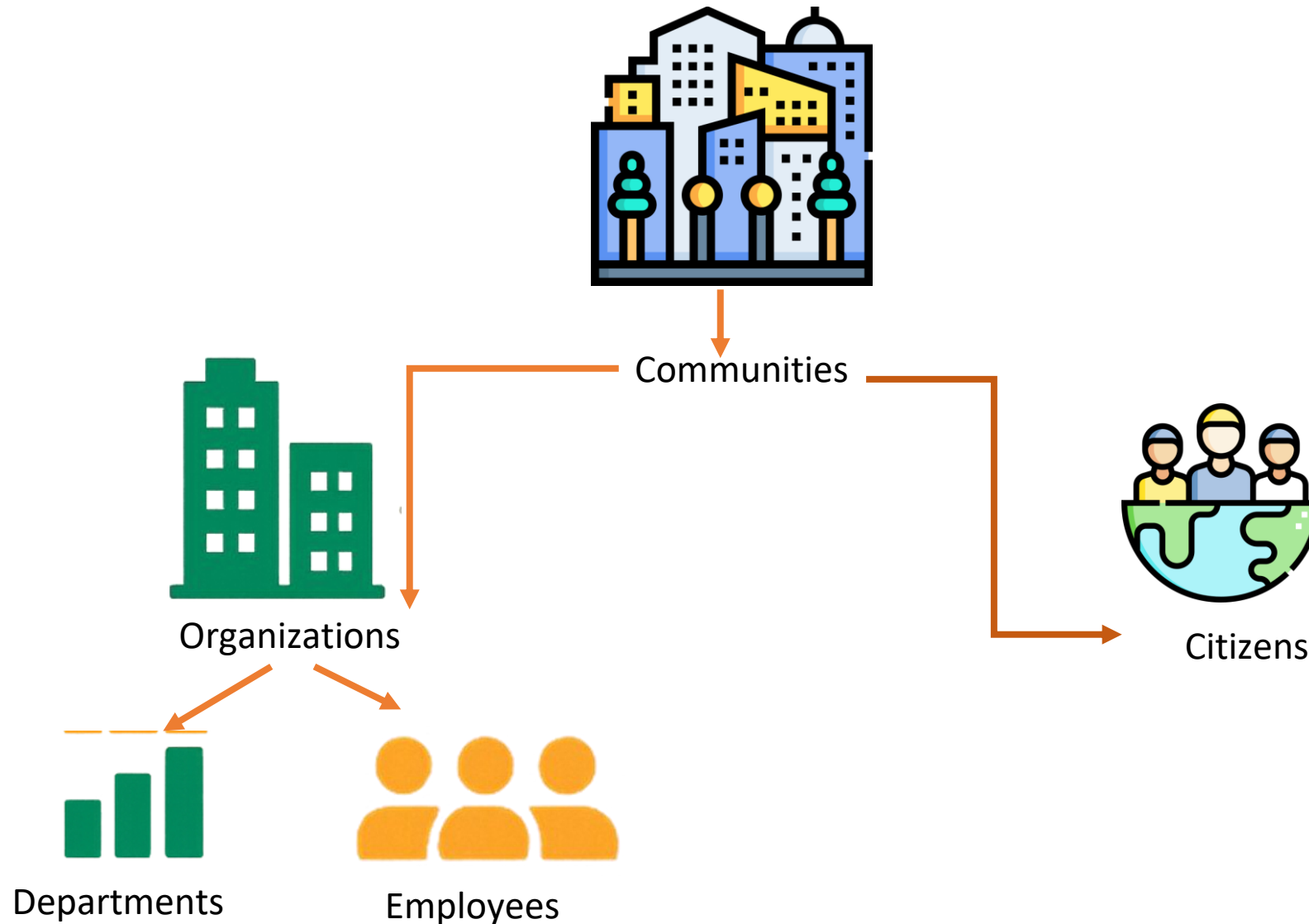
Commitment – Public pledges drive accountability



Gamified



Participation Displayed At All Scales



Human Psychology – Behavior Change

1

Designing effective
interventions

2

Nudging individuals

3

Fostering collective
actions

Tipping Point for Large Scale Social Change

25%!

Public attitudes shifted on issues like gay marriage, gun laws, or race and gender equality, as well as what beliefs are or aren't publicly acceptable to voice.

Individual Action Leads to System Change

- ↪ Adopt simple green behaviors.
- ↪ Influence those around them to also adopt the new behavior
- ↪ Committed to the new approach, influence politicians, city governments, heads of schools, or their employers.
- ↪ As commitment grows deeper, they may take on a new impact-orientated career



Greener Lifestyle Challenges

SMALL ACTS

Almost every action we take from the moment we wake up until we go to sleep requires energy. Reduce your impact, one act at a time.

EARN POINTS



DETRASH

Waste free living can save you money, improve your diet and help you avoid a myriad of toxic chemicals.


EARN POINTS



FAST FASHION

Cheaply made, overly consumed trendy pieces have harmful impacts on the environment, garment workers, animals, and wallets.

EARN POINTS



PROMISE GARDEN

Rewild your yard (or pockets of your yard), help restore our ecosystems and enjoy nature inspired outdoor spaces.

EARN POINTS





WASH CLOTHES IN COLD WATER

Unless heavily oil stained, washing clothes in cold water is just as effective. I will do this for:

Pick One



SUBMIT

 Action Points: 30

 Carbon Credits: ?



PLANT NATIVE SPECIES

They are tolerant to the climate they originate from and provide quality habitat for wildlife from insects to birds and mammals...

SUBMIT

 Action Points: 20



AC SETTING WHILE AT HOME

Turn up your A/C in the cooling season when at home as much as you can. In box below, enter....

of degrees F turned up

SUBMIT

 Action Points: 40

 Carbon Credits: ?

BUILD A GREENER FUTURE BY ENGAGING ALL



BYG's Impact: Real Results, Real Change

Platform Users

+1500

Organizations / People

Impact from 300
businesses

1,700

homes of the grid

Thomas Blurton

Engineer

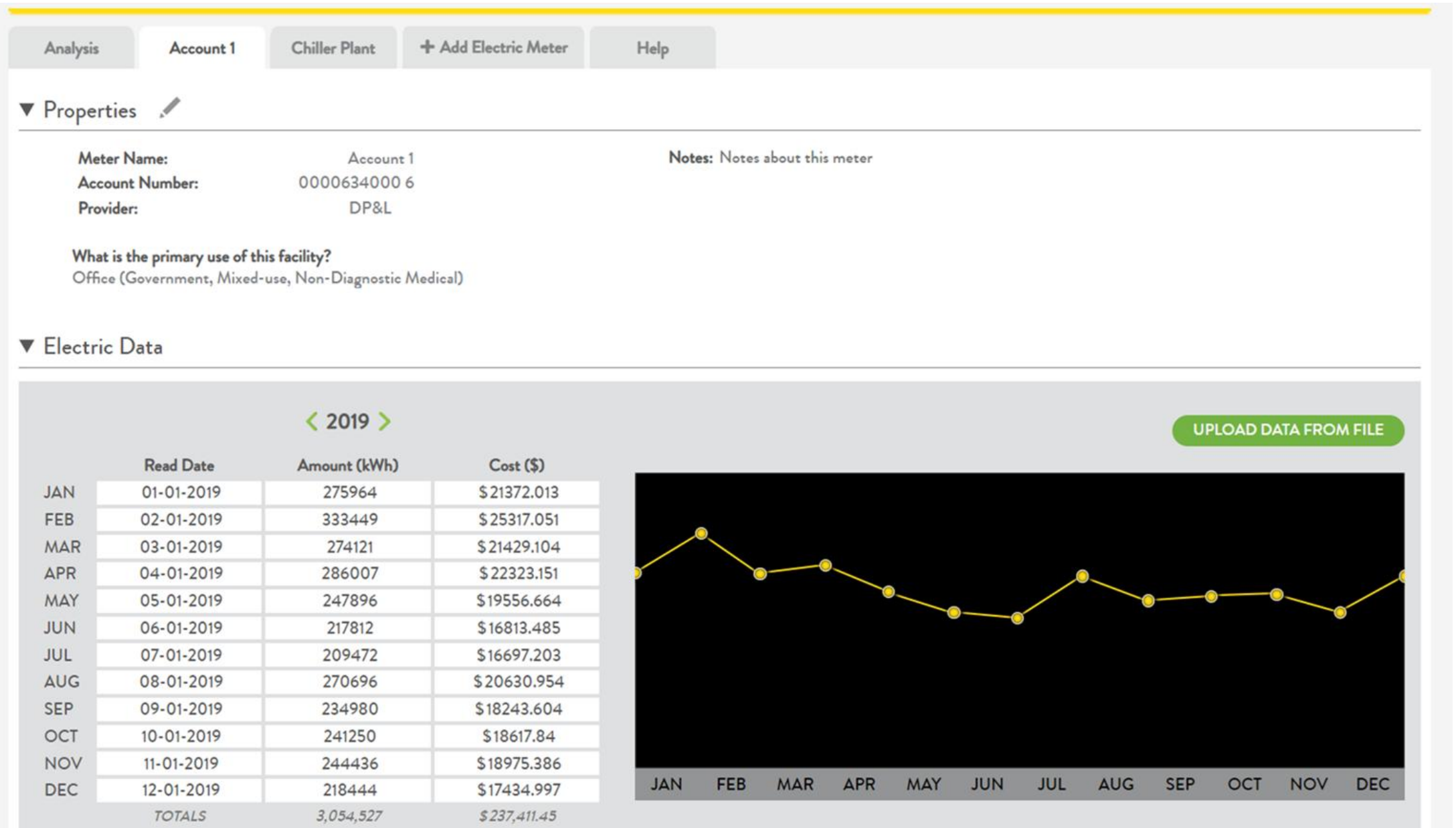
Thomas Richards Engineering



Simplifying Data

- Enable easy entry of utility data
- Demystify energy consumption
- Automate reporting and benchmarking
- Bring Your Green

Resource Tracking Tools



Analysis

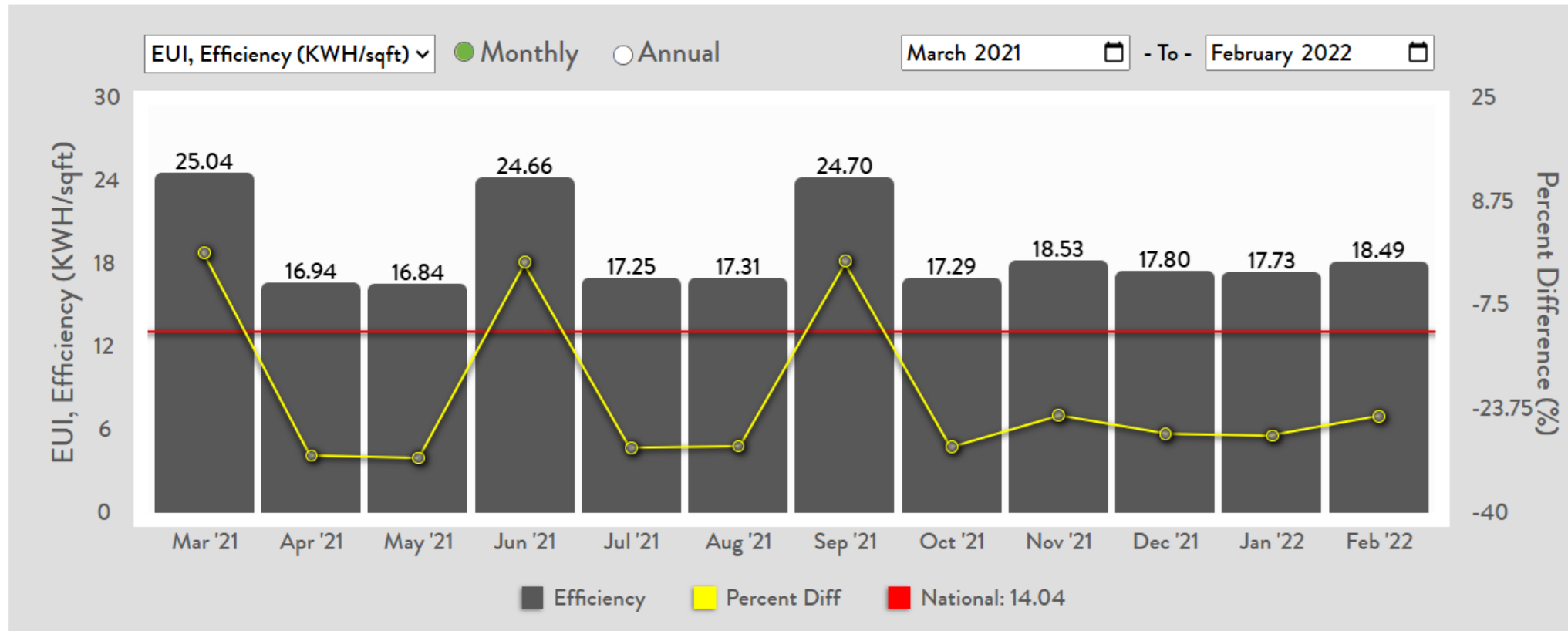
Account 1

Chiller Plant

+ Add Electric Meter

Help

OVERALL ELECTRIC ANALYSIS i



ANALYSIS OF MOST RECENT 12 MONTHS

MOST RECENT 12 MONTH CONSUMPTION



Account 1 - 843,237 KWh

ELECTRIC GRADE

F

10.89 EUI

*Comparison Uses data from CBECS

EFFICIENCY

National Avg.	8.34 kwh/sf
DRG Avg.	7.50 kwh/sf
You	10.89 kwh/sf

12 MONTH COST: \$41,601

Account 1 \$ 41,601 ✓ 15.4% (From Dec '20)

COST ANALYSIS

Consumption
¢4.93 /kWh

Extra Fees
\$0 /Month

ELECTRIC USE PROFILE

Non-HVAC	<div></div>	88.7%
Cooling	<div></div>	11.3%
Heating	<div></div>	0.0%

EMISSIONS OVER 12 MONTHS

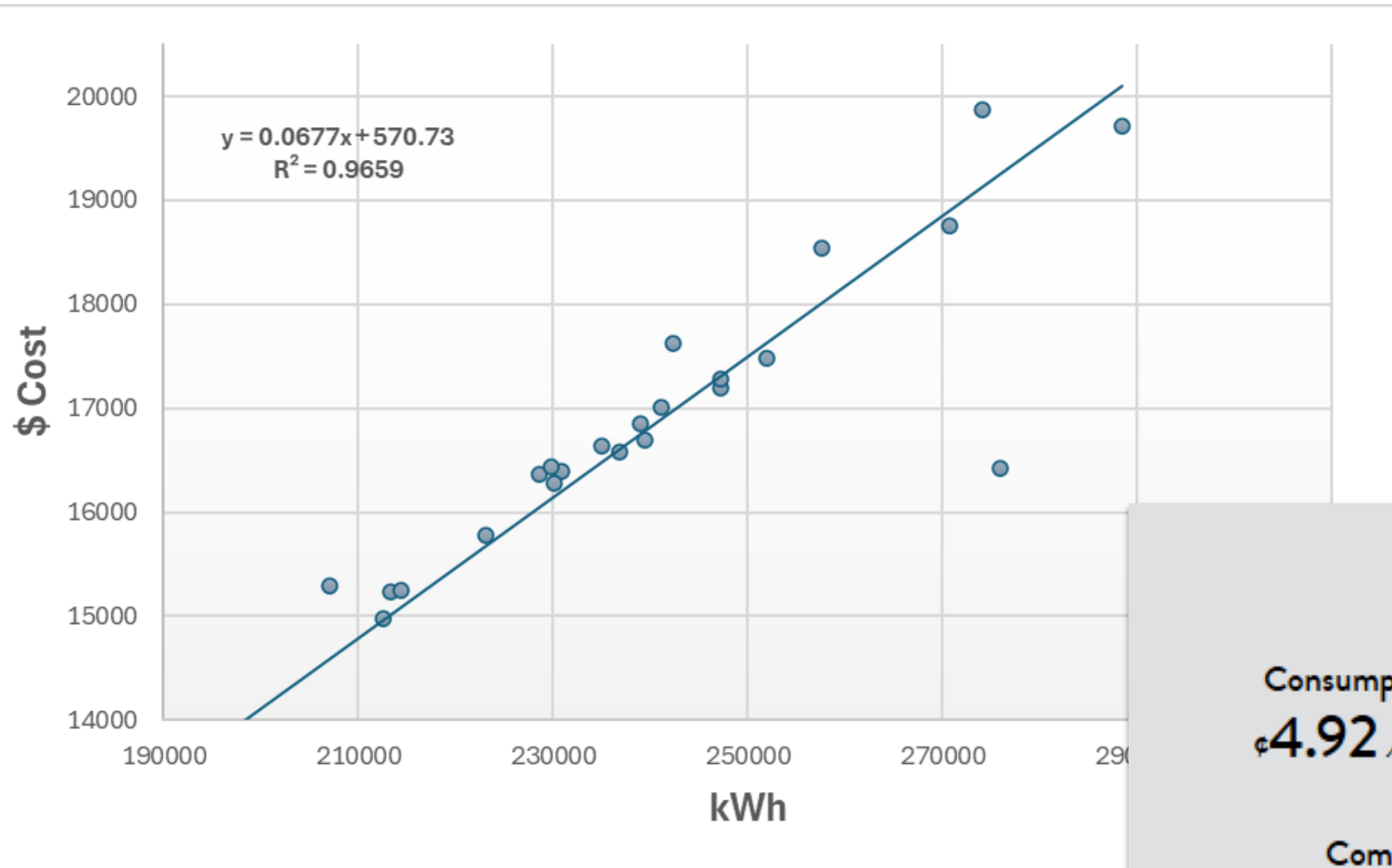
691.5 Tons
CO₂



Natural Gas 36.5%
Nuclear 34%
Coal 24%
Renewable 5.00%

*Ohio's Energy Sources

Stochastic Cost Analysis




COST ANALYSIS

Consumption

¢4.92 / kWh

Extra Fees

\$4,353.89 / Month

Computed with 97% accuracy. 

BRING YOUR GREEN!

- Dashboard
- Green Checklist
- Energy Audit
- Resource Tracking
- Challenges

ADD NEW APPLICATION

Help

RESOURCE TRACKING | MONTGOMERY COUNTY

ADMINISTRATION BUILDING ▾

Electric

Gas

Waste

Water

Portfolio

of Buildings
42

Total Square Footage
5,293,034

Total Occupants
4,277

Alerts

- Missing utility data for JFS / Job Center
- Missing utility data for Haines Children's Center
- Missing utility data for Parks Maintenance Building
- Missing utility data for DMCC building

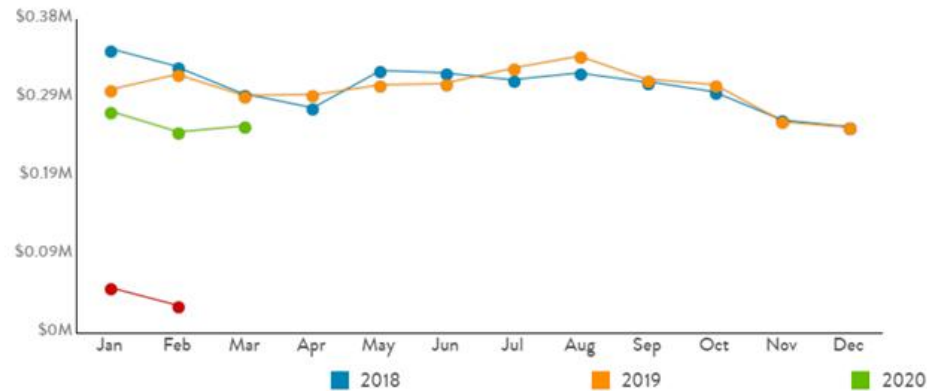
UPDATE
UPDATE
UPDATE
UPDATE

Energy (Electric & Natural Gas) Download Energy Report

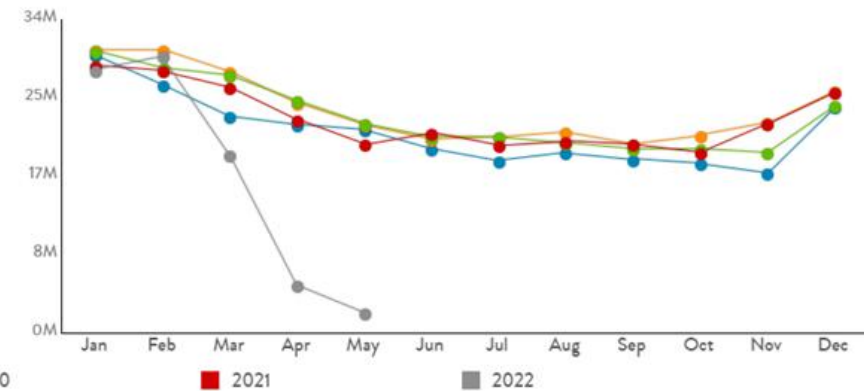
Select Buildings ▾

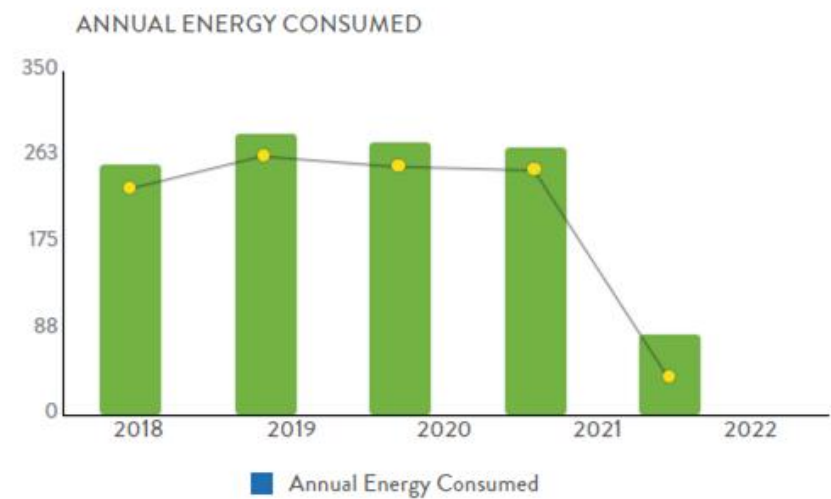
Select years ▾

ENERGY COST (\$)



ENERGY USE (MMBTU)





BUILDING ENERGY USE RANKING (worst to best)

Environmental Services - Dryden Pretreatment Plant

1995.37 kBTU/ft²

Animal Resource Center

1461.36 kBTU/ft²

Coroner Crime Lab

1198.30 kBTU/ft²

Stillwater Center

1007.65 kBTU/ft²

FUTURE FEATURES – DOE GRANT

Dayton's Energy Target Goal

- Automate data entry
- Allow buildings to be benchmarked by targets set by City or community
- Integrate platform with external APIs like ENERGY STAR – Portfolio Manager
- Automate building scorecard generation linked to city or region specific BPS targets

City of Dayton BPS Dashboard



Building Performance Standards Dashboard

EUI Compliance Settings ▼

High Performing Building EUI: 2.7

Max EUI to be in Compliance: 5.2

Minimum Square Footage Cutoff: 10,000

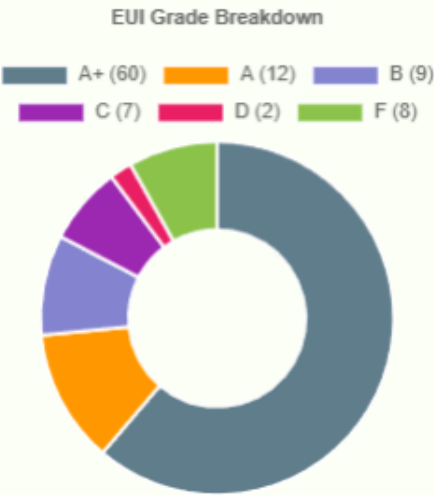
Year To Display ☐ 2000 ☐ 2019 ☐ 2020 ☐ 2021 ☐ 2022 ☐ 2023 ☒ 2024 ☐ 2025

Summary Analytics ▼

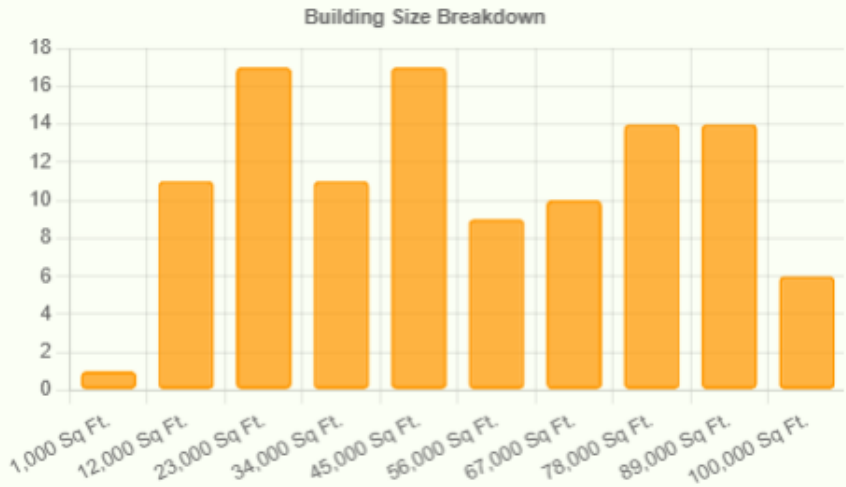
Compliance



Building Grade Breakdown

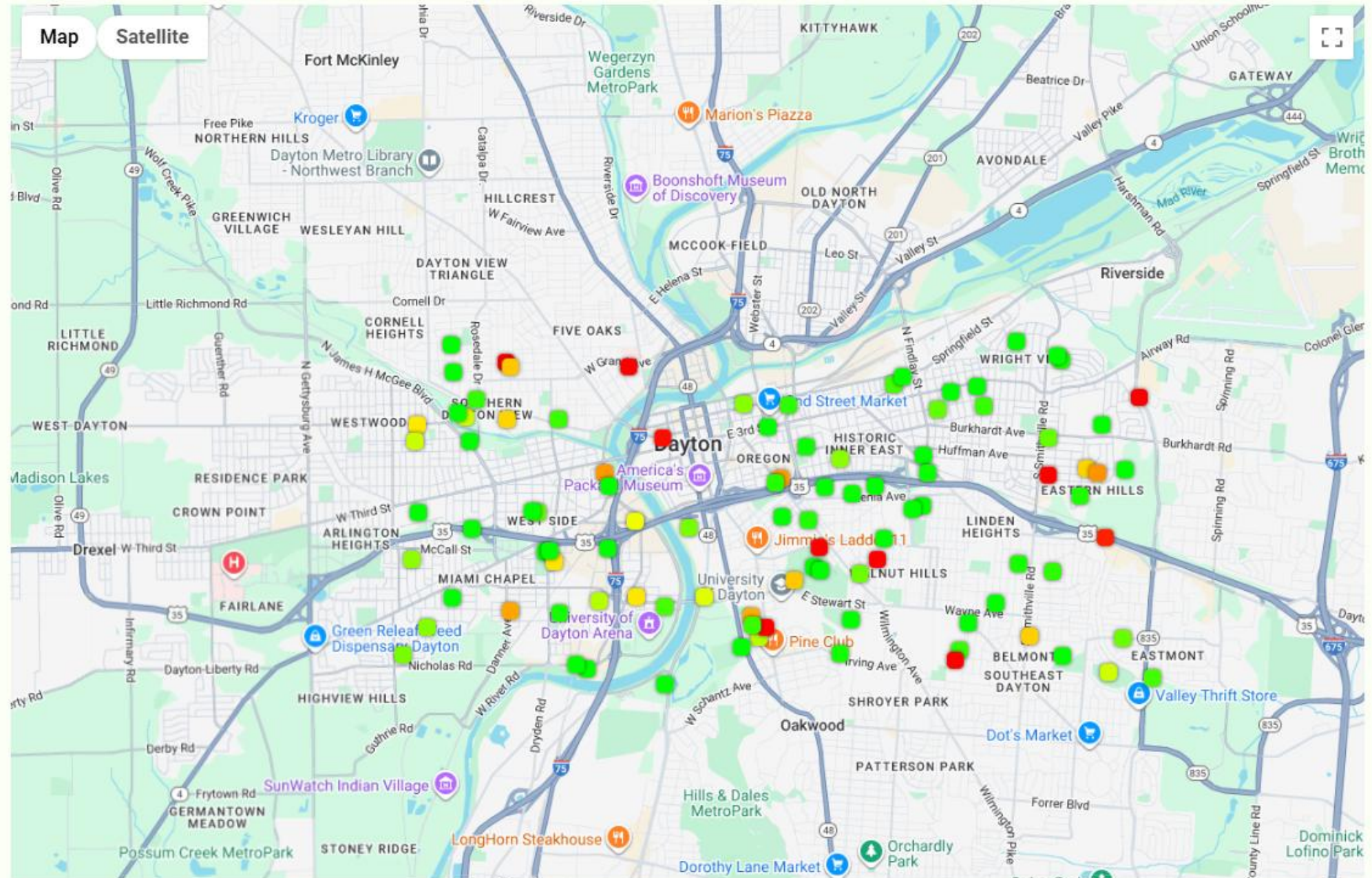


Total Building Stock Breakdown (98 Total)



Eui Breakdown (Total)





Meg Maloney

Sustainability Manager

City of Dayton



Community-Wide Emissions by Scope, Source, and Gas

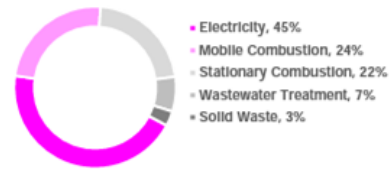


Figure 1.
Percentage of Gross Emissions by Source – City of
Dayton 2019



Figure 2.
Percentage of Emissions by Scope – City of Dayton
2019

2019 Emissions by Source - MT CO ₂ e	CO ₂	CH ₄	N ₂ O	Total	Percent of Total
Scope 1	971,636	204,109	14,300	1,190,045	55%
Stationary Combustion	480,937	1,068	271	482,276	22%
Mobile Combustion	490,699	1,402	13,322	505,423	24%
Solid Waste	-	56,683	-	56,683	3%
Wastewater Treatment	-	144,956	707	145,663	7%
Scope 2	952,578	2,208	3,722	958,508	45%
Electricity	952,578	2,208	3,722	958,508	45%
Scope 3	(29,705)	16	49	(29,009)	(1%)
Water	-	-	-	-	-
Agriculture & Land Management ³	-	-	49	49	0%
Urban Forestry	(29,075)	-	-	(29,075)	-1%
Waste Production	-	16	-	16	0%
2019 Total Gross Emissions	1,924,214	206,334	18,071	2,148,619	100%
2019 Total Net Emissions	1,895,139	206,334	18,071	2,119,544	

Community-Wide Emissions by Scope, Source, and Gas

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Other local programs for energy assistance



Department of Energy Industrial Training and Assessment Centers



Local engineering consultants



Ohio Department of Development State Energy Program



Montgomery County's Dayton Regional Green/Bring Your Green

Challenges

There is more demand than we can meet

There is a strong desire from the business community for standardized recommendations

Rising energy costs (higher demand, LNG exports, etc.)

Pressure from multiple sectors to address climate change impacts



Benefits to Bring Your Green

- Dayton Regional Green
 - Building owners voluntarily report on data for green business certification
 - Created AES Enhanced Rebates to incentivize efficiency
 - While these incentives do not exist anymore, the trust is still there
 - ~ 1,000 voluntary participating locations
- DRG is an advantage Dayton has over other cities – we want to make it even better

Benefits to Dayton Businesses



“You can’t manage what you don’t measure”



Complements existing work in our office with local businesses



Sets easy to understand and scalable goals

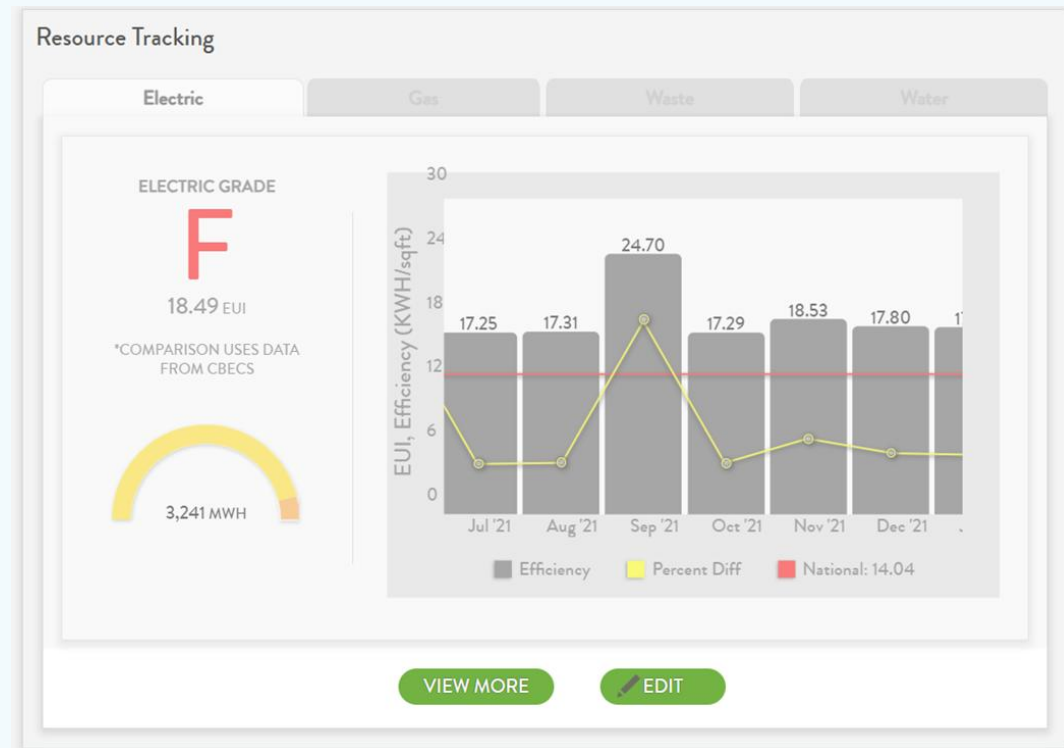
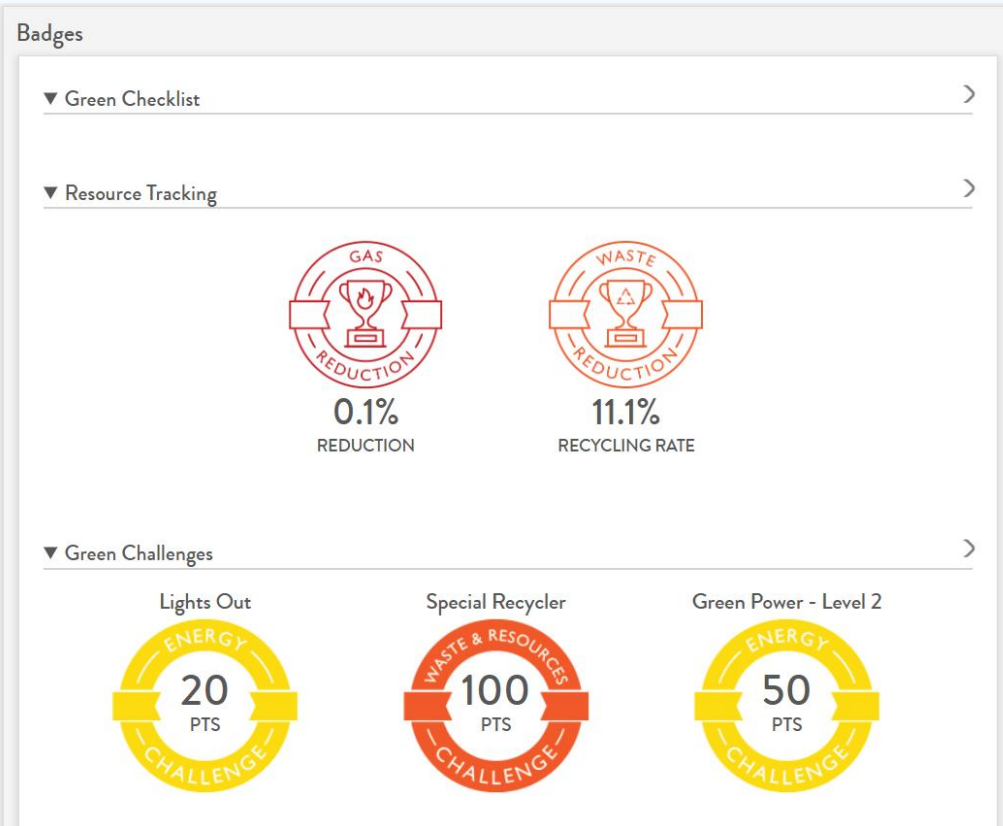


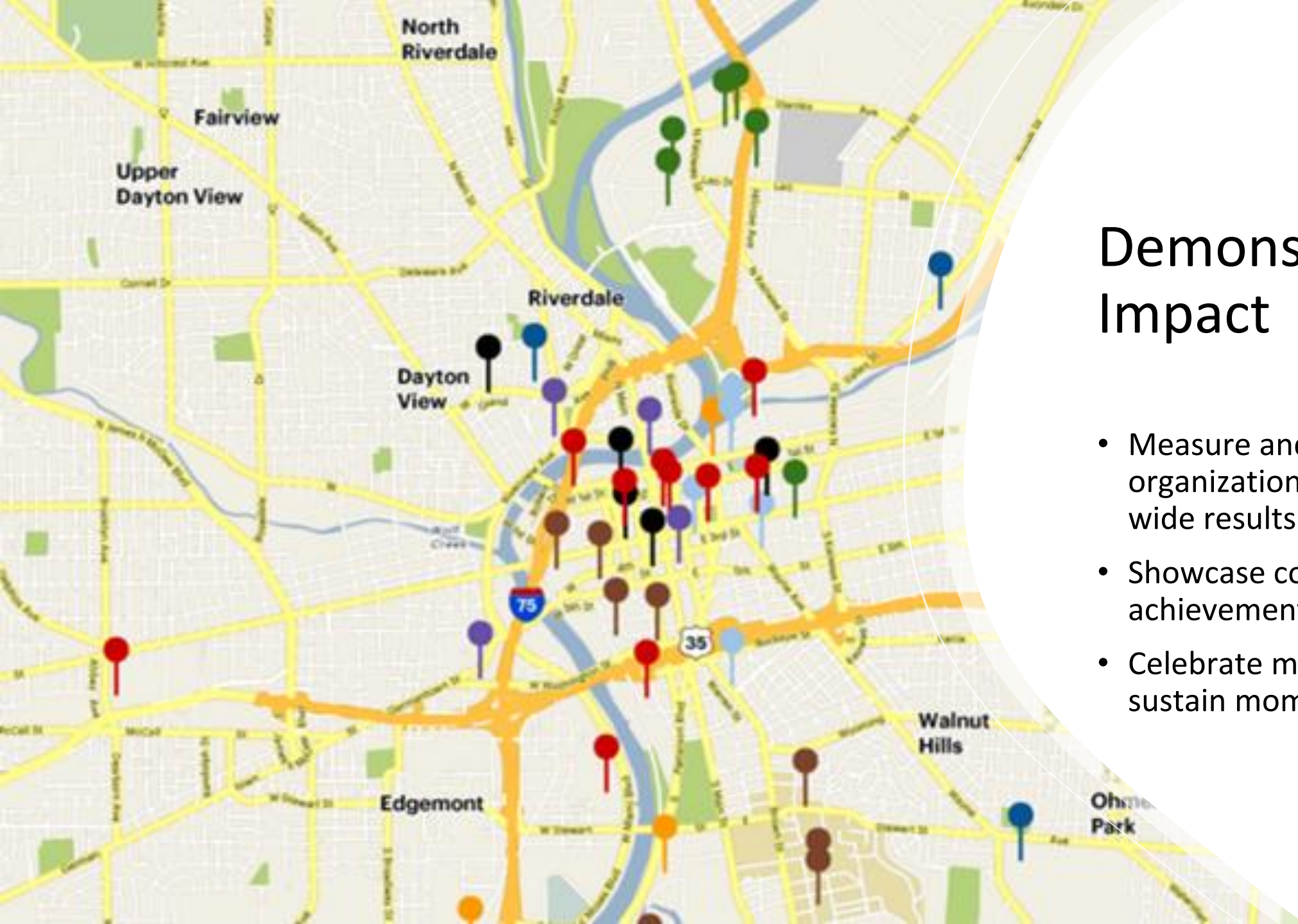
Creates the infrastructure needed to support building owners in their efforts to achieve energy savings



Preliminary analysis predicts cost savings of \$61,000 per building

Benefits to Dayton Businesses





Demonstrating Impact

- Measure and display organization and community-wide results
- Showcase collective achievements
- Celebrate milestones to sustain momentum

Outcomes & Cost Savings

Carbon reductions achieved through tracked actions



Energy savings translated to cost reductions



Improved community awareness and engagement



Your Sustainable Journey Starts Now!

Learn more at
BringYourGreen.com

Contact Our Speakers

