Building Performance Standards Advancements in Minnesota

Meeting 1 – 9.19.2024

Center for Energy and Environment

Agenda

- Introduction
- What is BPS
- Progress on:
    - Covered buildings
    - Metrics
    - Compliance resources

Speakers

Katie Jones
Sr. Manager, Community Policy

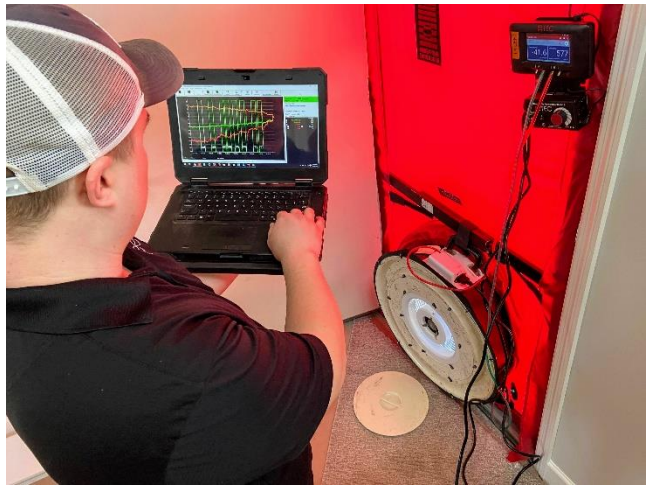
Rep. Larry Kraft
MN House of Representatives

Aly Eilers
Manager, Legislative Affairs

CEE's nonprofit mission

- The Center for Energy and Environment discovers and deploys the most effective energy solutions that strengthen the economy and improve the environment.

- We provide practical energy solutions for homes, businesses, and communities.



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CEE's nonprofit

PROGRAMS

We cut energy waste and improve comfort in homes, buildings, and communities.

RESEARCH

We identify cost-effective, efficient technologies through analysis, modeling, and engagement.

CONSULTING

We help building owners and entire communities achieve long-term, energy-saving solutions.

LENDING

We empower people to make upgrades on energy efficiency and comfort in homes or businesses.

POLICY

We strive for high-impact, pragmatic solutions guided by a public interest ethic.

MARKET TRANSFORMATION

We accelerate adoption of promising technologies through early market engagement.

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CEE's Principles for a BPS

- Build upon existing benchmarking policy
- Set practical milestones and targets using best practices
- BPS should align with our state's economy wide GHG reduction goals
- This policy will require significant ongoing funding, and we should leverage existing sources as much as possible
- Utilities will be able to claim savings and support retrofits

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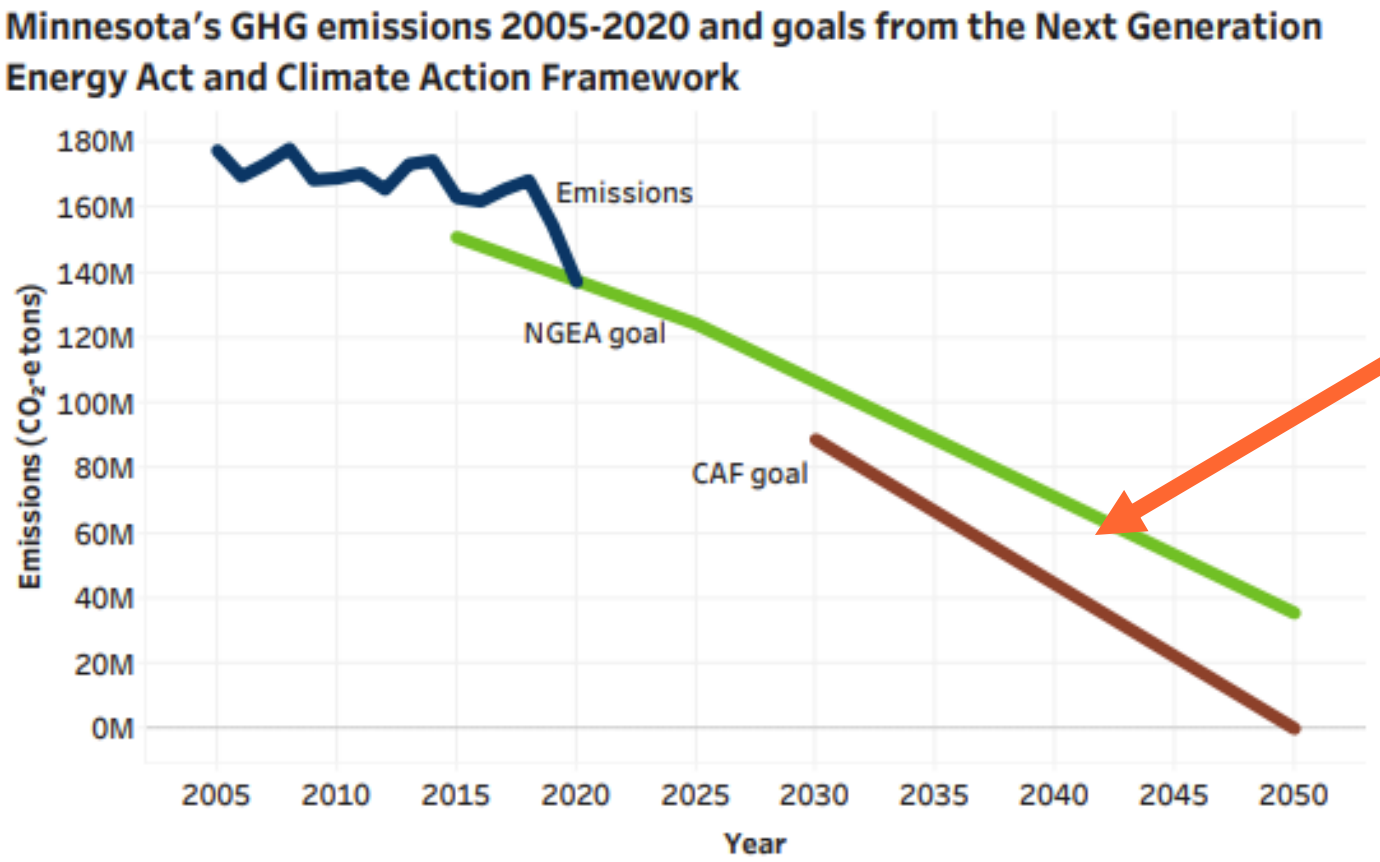
Up next: Rep. Kraft

- Why and what is a BPS
- Progress on:
    - Covered buildings
    - Metrics

Work to date



Minnesota has new targets in statute

2030

50% greenhouse emission reduction

2050

Net zero emissions

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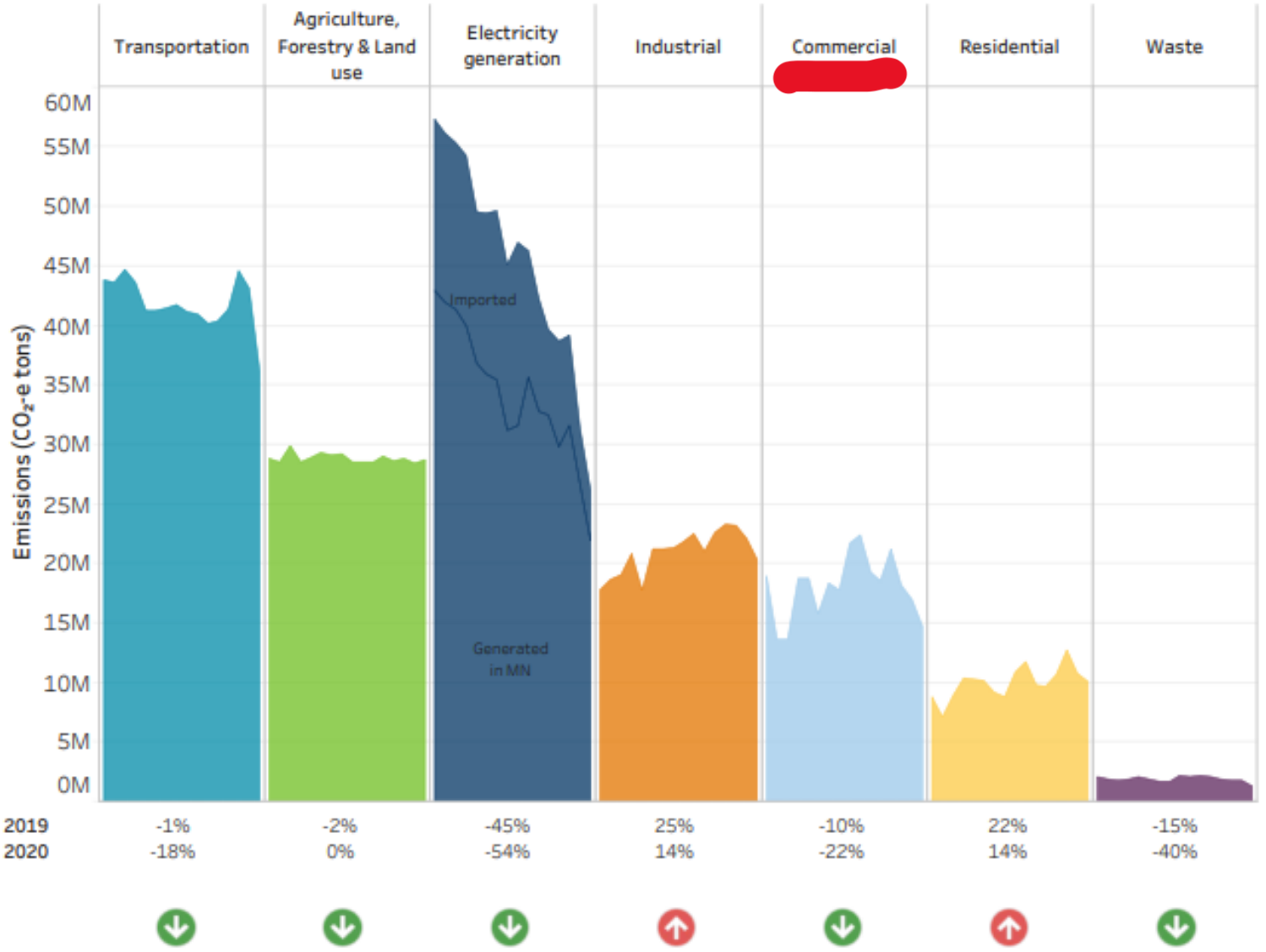
Large existing buildings emit a lot of greenhouse gases

Minnesota's 2023 biennial greenhouse gas emissions reduction report



Direction from Climate Action Framework

Measures of progress

By 2040, all of Minnesota's electricity is carbon-free.

By 2030, weatherize a quarter of dwellings where occupants earn 50% or less of the state median income.

By 2035, reduce GHG emissions from existing buildings by 50% compared to 2005 levels.

By 2030, reduce thermal GHG emissions by at least 20%, compared to 2005 levels.

By 2030, reduce energy use by 10% and total waste heat and waste electricity by 15%, compared to 2005 levels.

By 2030, reduce the energy burden so at least 80% of Minnesotans spend less than 5% of their household income on energy costs.

By 2030, reduce statewide primary energy usage by 10%, compared to 2005 levels.

Reducing building energy-related emissions creates additional benefits

- EXPAND LOCAL JOBS
- IMPROVED BUILDING OPERATION
- IMPROVED ENERGY BILL MANAGEMENT
- IMPROVED OCCUPANT HEALTH AND COMFORT

Let's dig into the bill!

- HF5423 / SF5533
- Introduced late in session
- Sen. McEwen
- Focused at large, existing buildings

What do we mean by "large existing buildings?"

- Structures that use energy and have existed for one year or longer
- Commercial, multifamily, public (government) buildings
- Generally, 50,000 sq. ft. and larger

Same definition as used in Commercial Building Benchmarking law passed in 2023

Building performance standards (BPS)

- A policy for existing buildings to drive continuous, long-term energy performance improvements and greenhouse gas reductions.
- Requires building owners to meet performance targets by actively improving their buildings over time.
- Building owners determine how they'll reach the target.

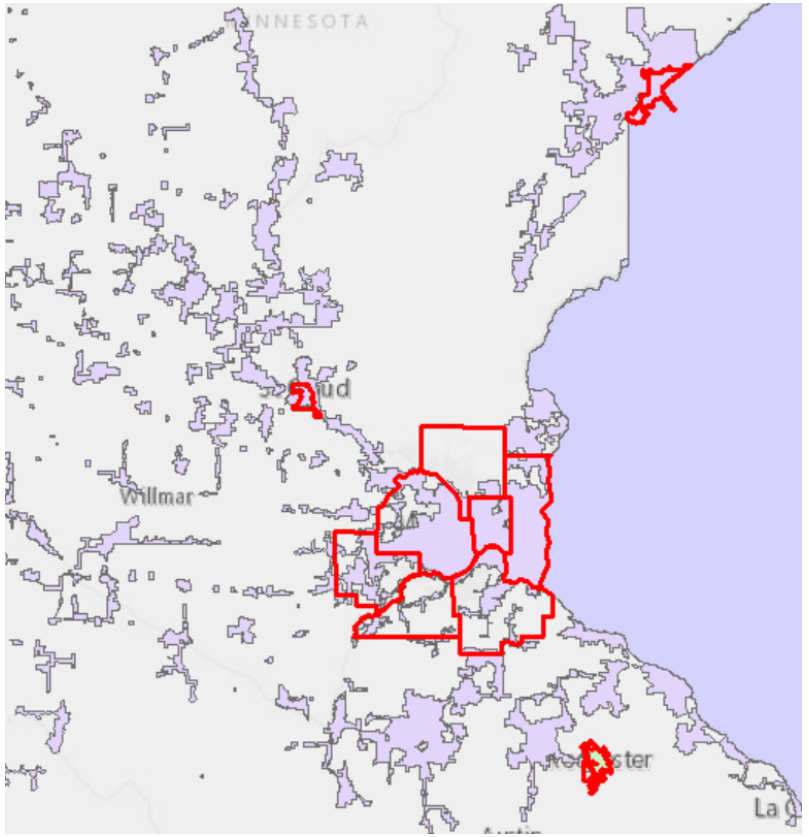
Image source: Institute for Market Transformation

Impacted buildings – clarification for public buildings

•Map of impacted areas outlined in red.

•Current definition in benchmarking law: "Covered property" means any property that is served by an investor-owned utility in the metropolitan area as defined in section 473.121, subdivision 2, or by a municipal energy utility or investor-owned utility in any city outside the metropolitan area with a population of over 50,000 residents, and that has one or more buildings containing in sum 50,000 gross square feet or greater.

•BPS would **also include public buildings** (schools, city, county, state government) within this geography



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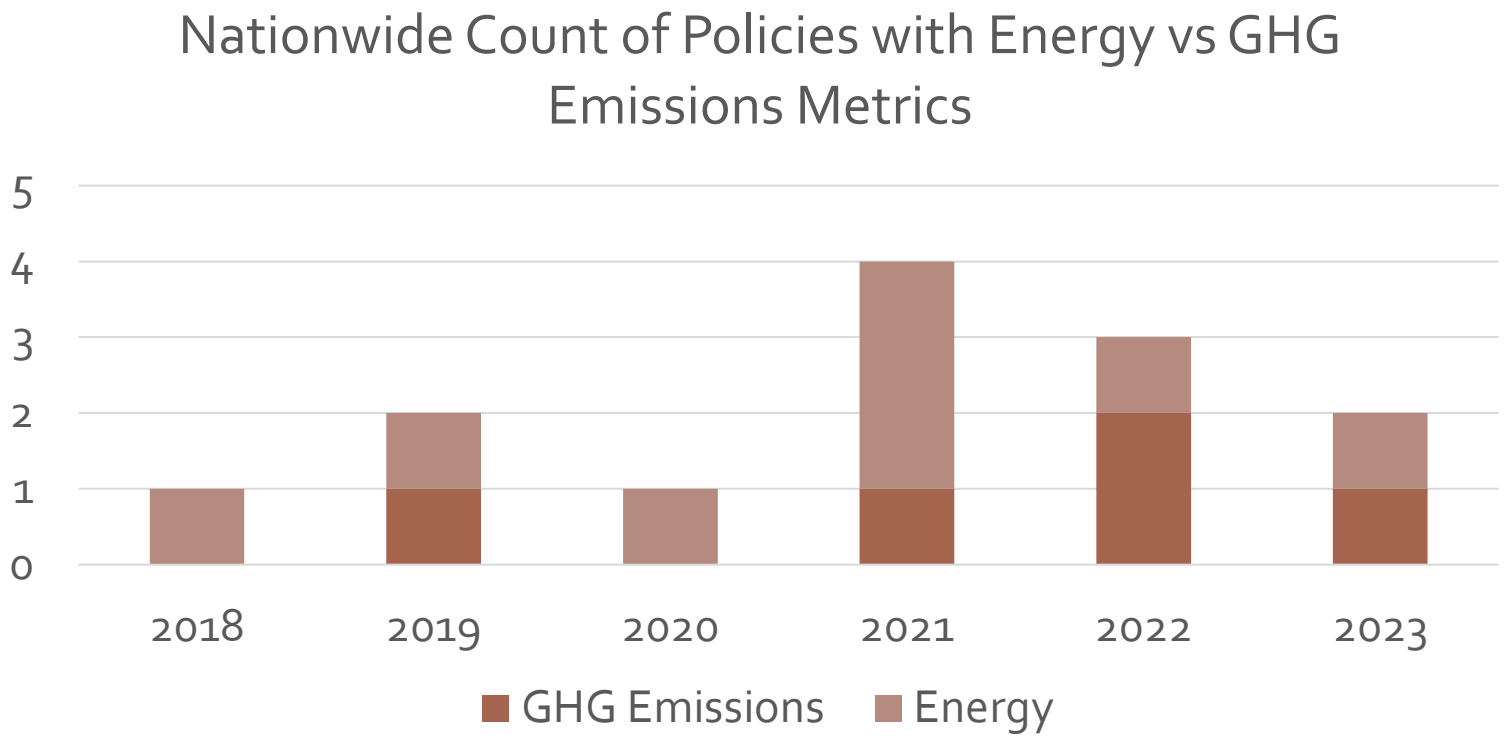
Metrics



The MN bill currently includes greenhouse gas emissions AND energy use intensity metrics.

Metrics – Feedback Summary

Site EUI Advantages	GHGi Advantages

• Simplicity
  ○ Easily calculated using total energy consumption from utility bills and gross square footage
• Energy is the current standard
  ○ Aligns with current building code and energy programs
  ○ Provides easier alignment for new buildings that need to meet building code during development and BPS once constructed
  ○ Energy is a common language among contractors, building managers, and utilities
  ○ Common language makes it easier to connect with and promote savings
  ○ Builds on benchmarking
  ○ Direct connection to energy burden
  ○ Feels less mysterious to building managers
• Energy efficiency focus
  ○ Cuts waste and costs
  ○ Reduces grid strain
  ○ Pace of utility grid greening is irrelevant
  ○ Drives energy optimization
  ○ Less risk of increasing energy burden
• Fuel neutral
  ○ Energy code is agnostic to type of energy used
  ○ Likely garners fewer detractors
  ○ Creates equitable incentives between utilities
	• Alignment with the State's core climate goal and impetus for BPS
	• Flexibility
	  ○ Compliance options of energy efficiency and/or clean energy generation
	  ○ Accommodates buildings that have limited ability to do energy efficiency onsite
	  ○ Provides additional options for buildings that may struggle with efficiency alone (e.g., historic buildings)
	• Increase climate literacy
	  ○ Clearly connects building performance to climate change
	  ○ Raises awareness of climate change
	  ○ Models exist to easily calculate GHG emissions
	• Leverage the greening of the grid
	  ○ Minnesota's 2040 100% clean electricity utility mandate gives a clear timeline of lower emissions energy source
	• Incentive alignment
	  ○ Some IRA funding is GHG based

Metrics – Moving forward with EUI

- Based on further discussion and stakeholder feedback, we will change to EUI in the bill
- Benefits of doing so:
  - Xyz from Larry
- From beginning, target has been to reach 90% greenhouse gas emissions reduction by 2045
  - An equivalent EUI reduction of 44% will be needed based on LBNL modeling

Results from the impact analysis

- Katie to add building stock info

Compliance Resources

- Show list/table – Katie to add

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Compliance Resources

- Show list/table – Katie to add

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Commercial Utility Program Recommendations

ECO #	Description	Total Annual Cost Savings		Project Cost	Simple Payback	Total Rebate	Payback with Rebate
		($)	(%)	($)	(yrs)	($)	(yrs)
5.1	Occupancy Schedule Optimization with Optimum Start	$11,093	16.9%	$73,400	6.6	$11,547	5.6
5.2	RTU Supply Fans VFD	$6,395	9.7%	$8,250	1.3	$2,500	0.9
5.3	Duct Static Pressure Reset	$233	0.4%	$200	0.9	$0	0.9
5.4	Economizer Lockout Optimization	$172	0.3%	$0	0.0	$0	0.0
5.5	High Efficiency Condensing Boiler	$1,712	2.6%	$8,400	4.9	$4,200	0.0
5.6	HWP ECM Motor	$721	1.1%	$8,948	12.4	$830	11.3
Totals		**$20,327**	30.9%	**$99,198**	**4.88**	**$19,077**	**3.94**

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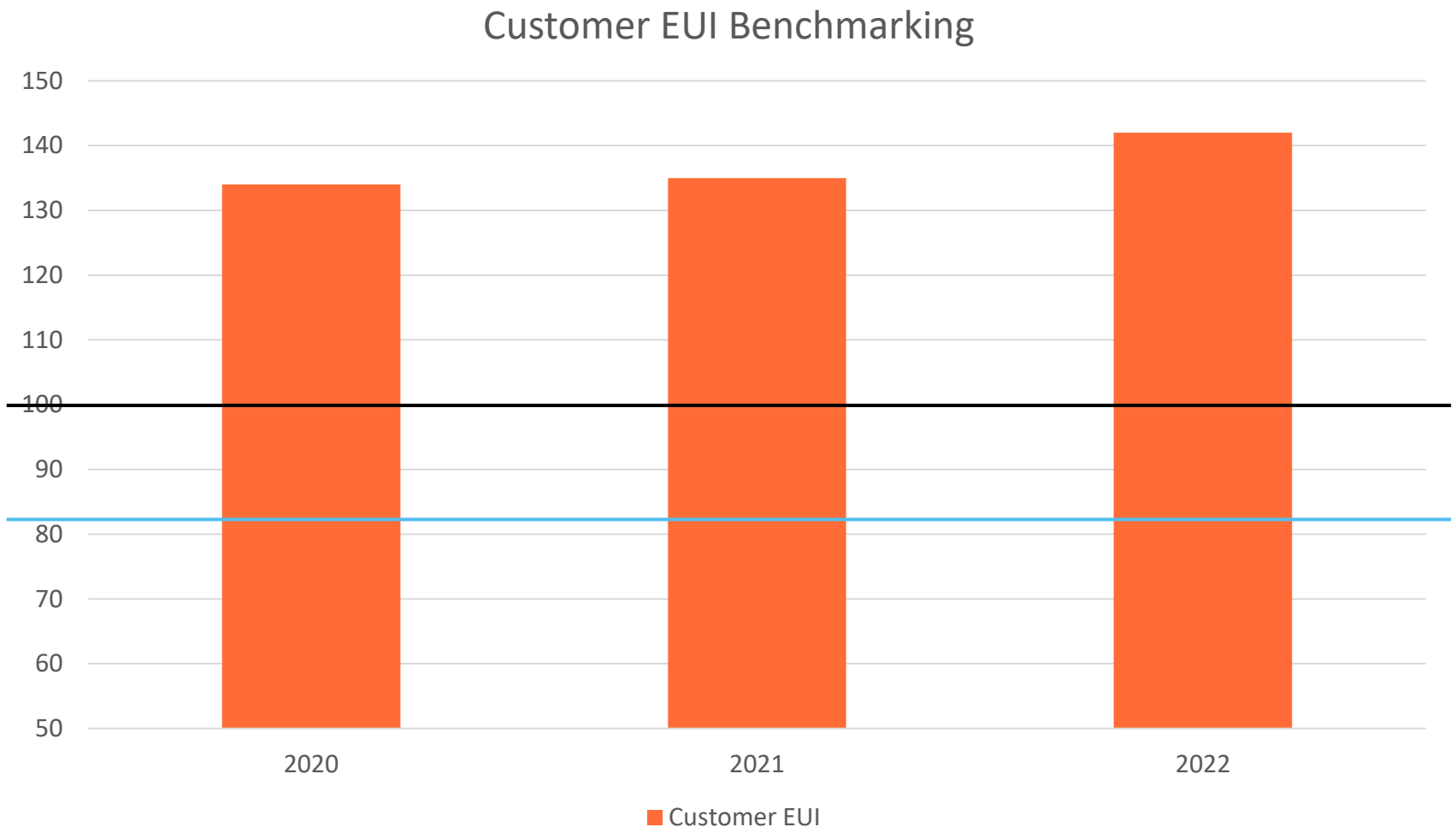
Commercial Program Example



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Multifamily Utility Program Recommendations

ECO	Recommendations	Savings (annual)	Savings ($/yr)*	Cost Estimate	Rebate	Payback	SIR***
1	Adjust boiler outdoor reset and cutout control settings (High Pointe II)	337 therms	$391	$0	$0	Immediate	No investment
2	Consider a boiler tune-up by a qualified HVAC contractor	432 therms	$504	$1,330	$1,330	Immediate	No investment
3	Replace non-functioning boiler outdoor reset and cutout control (High Pointe I)	1,181 therms	$1,382	$1,188	$600	0.4 years	24
4	Upgrade stairwell lighting to LED	6,833 kWh	$683	$1,026	Contact RPU for rebates	1.5 years	10.7
5	Replace your boilers with high-efficiency (95%+) boilers upon failure	3,447 therms	$4,014	$21,240**	$11,610	2.4 years	8.3
6	Upgrade hallway lighting to LED	27,997 kWh	$2,800	$6,277	Contact RPU for rebates	2.2 years	7
7	When replacing choose a high-efficiency, condensing water heater (High Pointe I)	292 therms	$341	$1,350**	$600	2.2 years	5
8	Replace community room and laundry room lighting with LED	4,152 kWh	$415	$2,344	Contact RPU for rebates	5.6 years	2.8
9	Replace exterior lighting with LED bulbs	8,213 kWh	$821	$5,265	Contact RPU for rebates	6.4 years	2.3
10	Install the Enovative AutoHot Demand Control recirculation pump control	591 therms	$720	$4,000	$591	4.7 years	2.1

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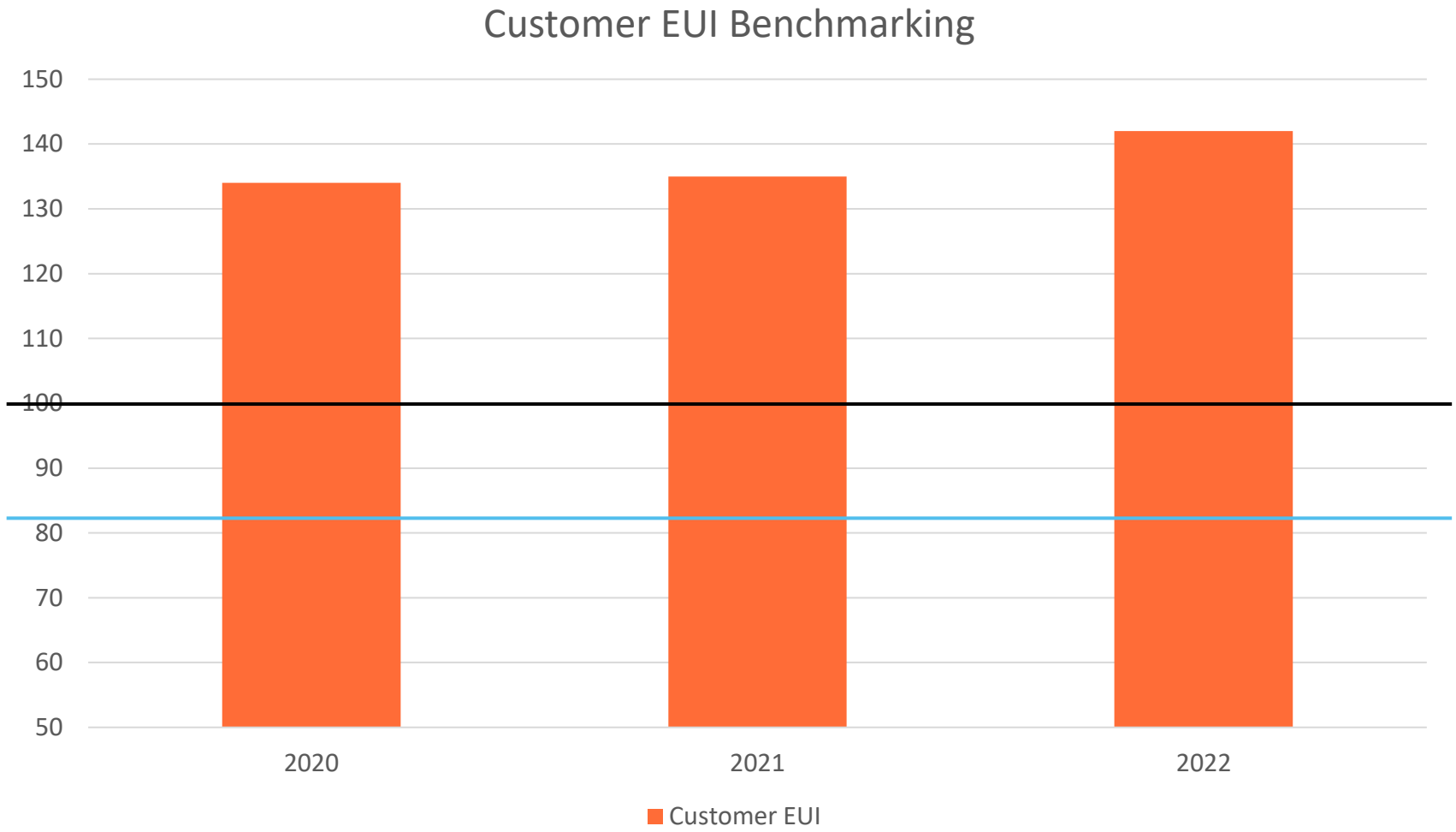
Multifamily Program Example (Needs Update w/MF Data)



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Questions

Next Steps

- Upcoming sector focused meetings:
  - Affordable housing
  - Utilities?
- Next meeting date:

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https://www.menti.com/

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THANK YOU!

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