



Building Performance Standards Stakeholder Committee Meeting #2

February 28, 2023

Meeting Agenda

12:00 **Welcome, Brief Re-Introductions and Goals for Today**

12:20 **Agenda Review, Process Agreements and Context for Today's Discussion**

12:30 **Which Buildings Should Be Covered by the BPS?**

12:55 **What Should Aspen's Energy Efficiency Targets Be?**

1:25 **BREAK**

1:30 **Small Group Discussions** – consider the policy options presented

2:15 **Group Debrief**

2:30 **Getting from Here to There – What Types of Compliance Support May Be Needed?**

2:55 **Role of Workgroups Going Forward – Equity + Workforce and Potentially Water**

2:55 **Next steps + March Committee meeting**



Where We Are in the Process + Where We're Going

Meeting 1 January 24th	Introductions, background and scope or 'charge' for the Committee
Meeting 2 February 28th	<ul style="list-style-type: none">• What buildings should be covered• Energy efficiency targets/policy options• Supports needed• Workforce• Discuss workgroup formation
Meeting 3 March 21st	<ul style="list-style-type: none">• Beneficial electrification policy options• Alternative compliance• Workforce• Supports needed
Meeting 4 April 25th	<ul style="list-style-type: none">• Costs and funding, with equity focus• Compliance/Enforcement• Workforce• Supports needed
Meeting 5 May, 31st	Synthesize recommendations, discuss next steps + wrap up



Meeting Participation / Agreements

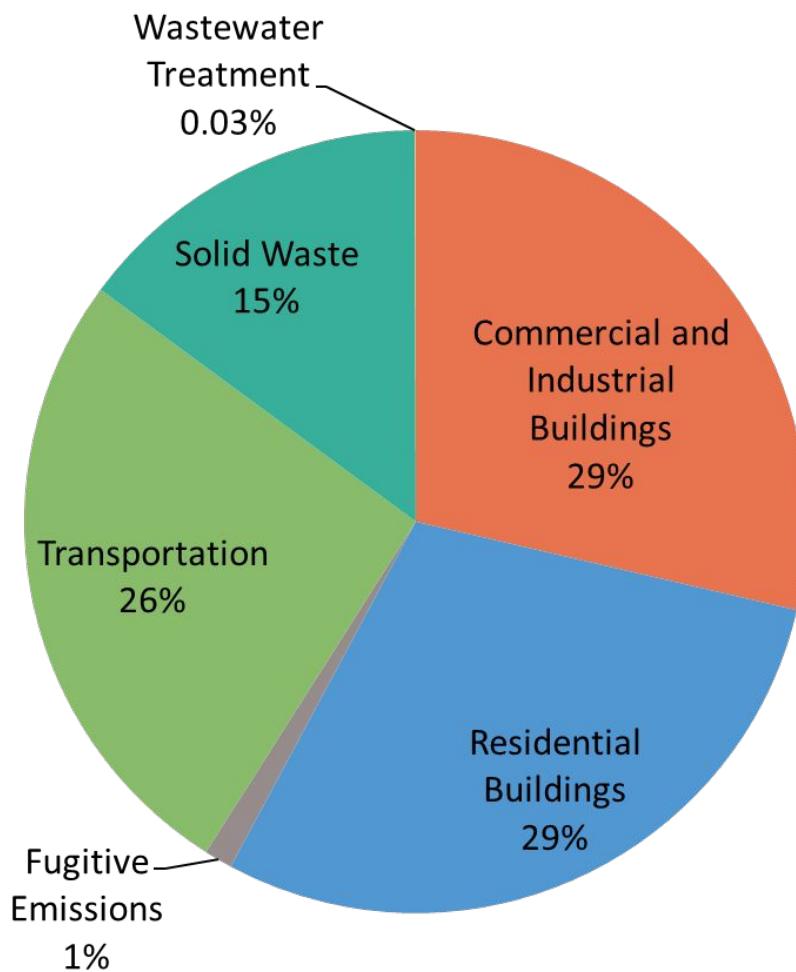
- ❖ Thank you for being present and **engaged!**
- ❖ Please help create an **inclusive**, participatory atmosphere.
- ❖ There are no dumb **questions!**
- ❖ Seek creative solutions that respond to your + others' **interests.**
- ❖ Engage in respectful, **constructive** dialogue with others.

- ❖ Feel free to ask clarifying questions as we go (via Chat or 'hand raise' function), but please hold other topics/questions until our **Discussion** time.

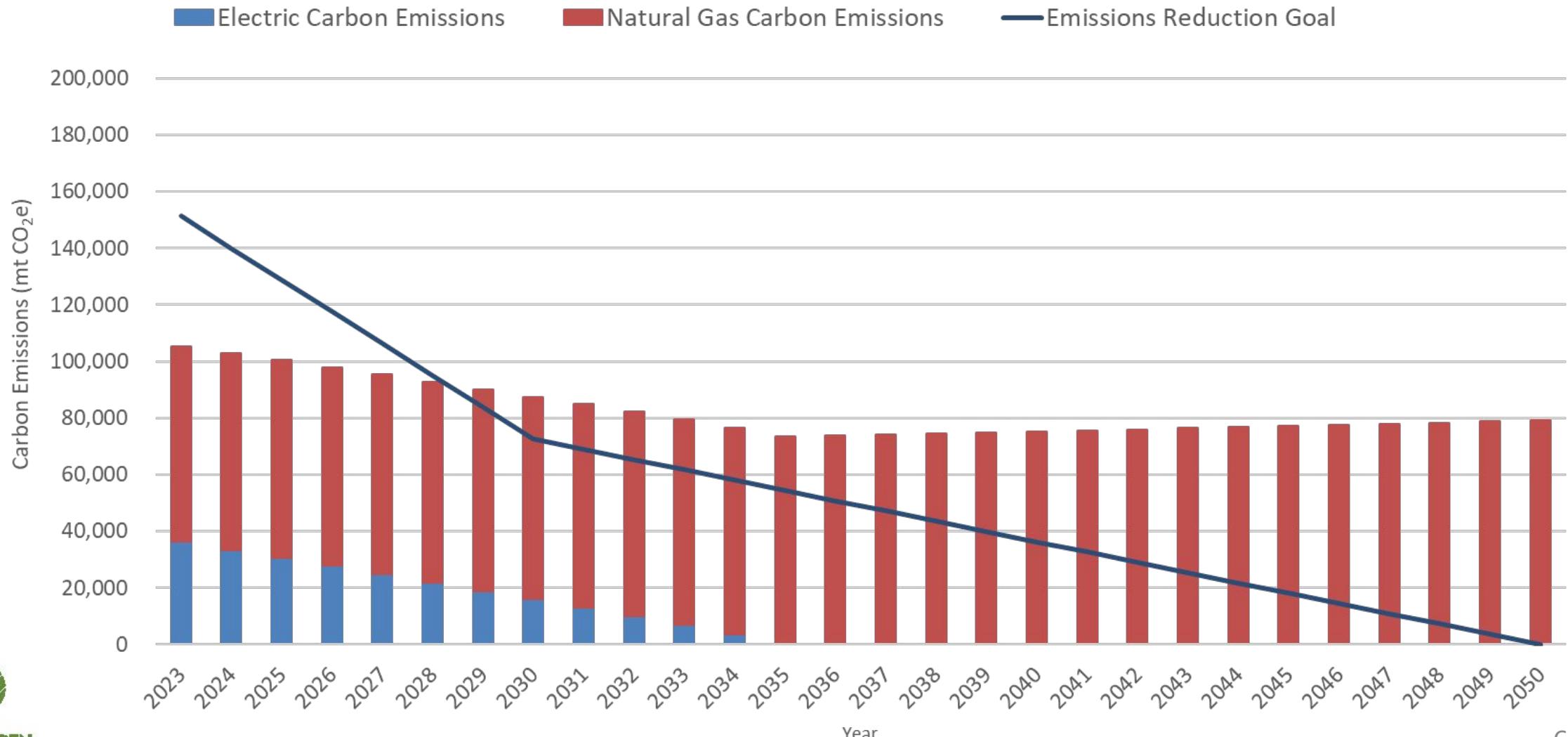


Buildings are Aspen's biggest contributor to GHG emissions

Emissions by Sector (mt CO2e)



Business as Usual Emissions from Buildings



Principles

- Reaching Aspen's decarbonization goal.
- Ensuring the policy is easy to understand and achievable.
- Ensuring BPS is feasible and practical from the perspective of building owners and managers..
- Incentivizing the adaptation of current infrastructure to minimize demolition waste.
- Keeping Committee discussions sufficiently high-level to develop a realistic framework and fleshing out the BPS over time in light of unique circumstances and/or subsequent policy needs.
- Use of pilot projects and 'proof of concept' case studies where useful to promote learning and build buy-in, receive and incorporate feedback from building owners, and adapt accordingly.
- Providing buildings with information so they can plan capital expenditures within different compliance periods.
- Building community awareness about long-term financial, climate, and health-related savings, as well as the upfront costs to buildings.

What about Cost? (Principles, cont.)

- Ensuring BPS is feasible and practical from the perspective of building owners and managers.
- Avoiding cost burdens for those least able to afford it; ensure the costs of compliance are not born by the most vulnerable citizens and don't impact remaining affordable housing in Aspen.
- Avoiding unintended consequences in terms of costs and energy use.
- Having transparent conversations about policy trade-offs, from climate impacts to community costs and benefits.
- Providing buildings with information so they can plan capital expenditures within different compliance periods.
- Building community awareness about long-term financial, climate, and health-related savings, as well as the upfront costs to buildings.
- Incentivizing the adaptation of current infrastructure to minimize demolition waste.



What about Cost? (Principles cont.)

- **Incentivizing the adaptation of current infrastructure to minimize demolition waste.**
- **Providing buildings with information so they can plan capital expenditures within different compliance periods.**
- Ensuring BPS is feasible and practical from the perspective of building owners and managers.
- Avoiding cost burdens for those least able to afford it; ensure the costs of compliance are not born by the most vulnerable citizens and don't impact remaining affordable housing in Aspen.
- Avoiding unintended consequences in terms of costs and energy use.
- Having transparent conversations about policy trade-offs, from climate impacts to community costs and benefits.
- Building community awareness about long-term financial, climate, and health-related savings, as well as the upfront costs to buildings.

Recap of Committee's Purpose

- Provide input to City staff in developing draft Building Performance Standards (BPS) guidelines for **existing** buildings to help City of Aspen reach goal of **zero** greenhouse gas emissions by **2050.***
- Guidelines may consider related opportunities to develop **workforce** skillsets, foster **job** creation, and improve **health** and **equity**.

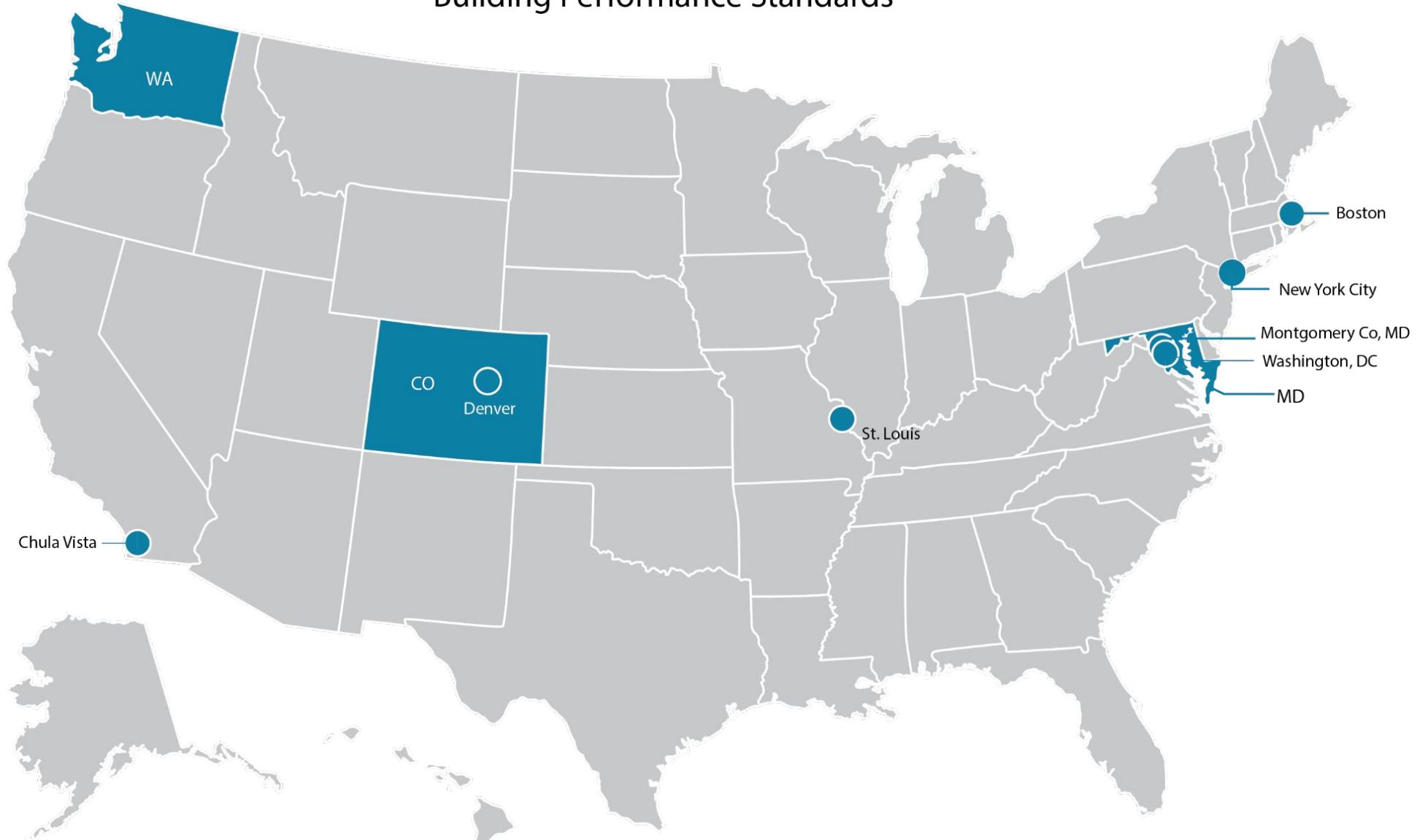


National Building Performance Standards Coalition

January 25, 2023



U.S. City and State Policies for Existing Buildings: Building Performance Standards



Key Components of BPS Energy Efficiency Guidelines

1. Building sizes
2. Building types
3. Targets and how to meet them



Key Components of BPS Energy Efficiency Guidelines

1. Building sizes
2. Building types
3. Targets and how to meet them



Denver

Covered Buildings	Targets	Compliance
Commercial & Multifamily >25k sq ft (buildings required to comply with benchmarking ordinance)	<p>EUI targets for specified by building type that achieve 30% energy savings across all buildings.</p> <p>Interim targets for 2024 and 2027 set by building's trajectory from baseline site EUI performance to final site EUI standard for property type</p>	<p>Meet 2024, 2027 interim targets and 2030 final performance standard and maintain that performance afterward.</p> <p>Prescriptive compliance options for buildings 25-100k sq ft inquiring electrification of at least 70 % of heating and water heating load and verification of the use of LEDs lighting. Still required to meet 2030 target.</p>



Washington D.C.

Covered Buildings	Targets	Compliance
2021 Privately owned buildings $\geq 50k$ sq ft; District-owned buildings $\geq 10k$ sq ft	ENERGY STAR score: no lower than the District median score for each property type. New target every 6 years	Cycle: 5 years with 1 year in between to recalculate the standards
2027 Privately owned buildings $\geq 25k$ sq ft	Source EUI for ENERGY STAR ineligible buildings	Meet the performance standard OR Reduce site EUI by 20% in cycle
2033 Privately owned buildings $\geq 10k$ sq ft	Assess emissions metric by 2023	Comply prescriptively OR If the standard for property type is $>$ than national median, can improve performance to standard by end of cycle



Boston

Covered Buildings	Targets	Compliance
<p>All municipal buildings</p> <p>Non-residential buildings $\geq 20,000$ sq ft</p> <p>Residential buildings that have 15 or more units.</p> <p>Any parcel with multiple buildings that sum to $\geq 20k$ sq ft or 15 units.</p>	<p>Annual greenhouse gas (GHG) emissions (tCO₂e/sq. ft.)</p> <p>Building targets set by building type on emissions intensity basis, each building's target being multiplied by its gross floor area.</p>	<p>Buildings must meet targets annually starting in 2025 and targets ratcheted down every 5 years. Buildings can also opt into “glide path” target achieve 50% emissions reduction by 2030 and 100% by 2050 using a 2005 or later baseline</p> <p>Any combination of energy efficiency, electrification, onsite renewables is allowed to reach targets</p> <p>Buildings may use Renewable Energy Credits (RECs) to offset GHG emissions from electrical demand.</p>

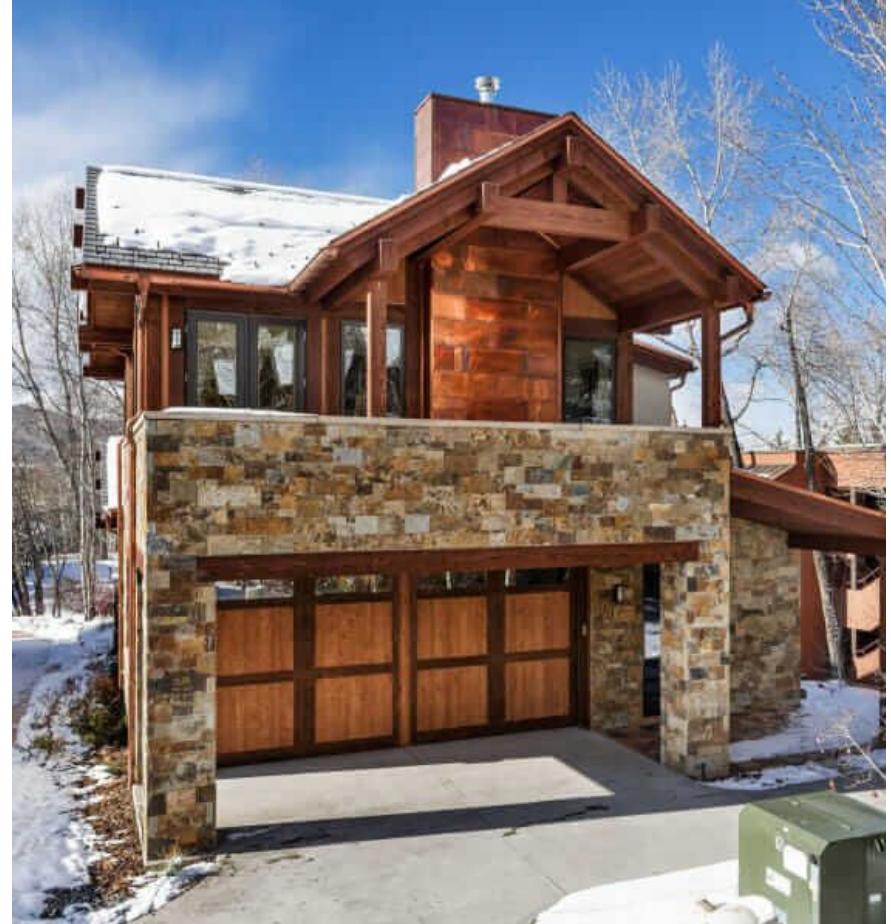


Key Components of BPS Energy Efficiency Guidelines: Part 1

- 1. Building sizes**
- 2. Building types**
3. Targets and how to meet them

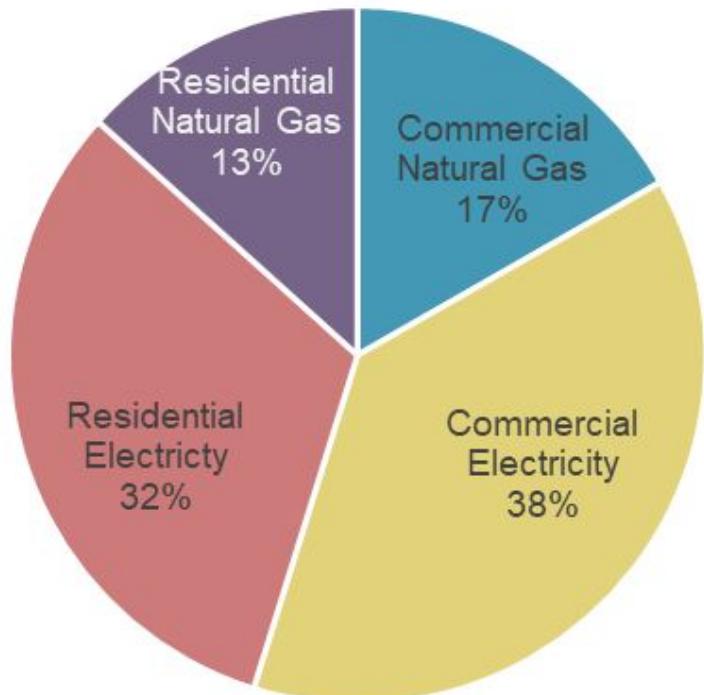


What Buildings Should be Covered?

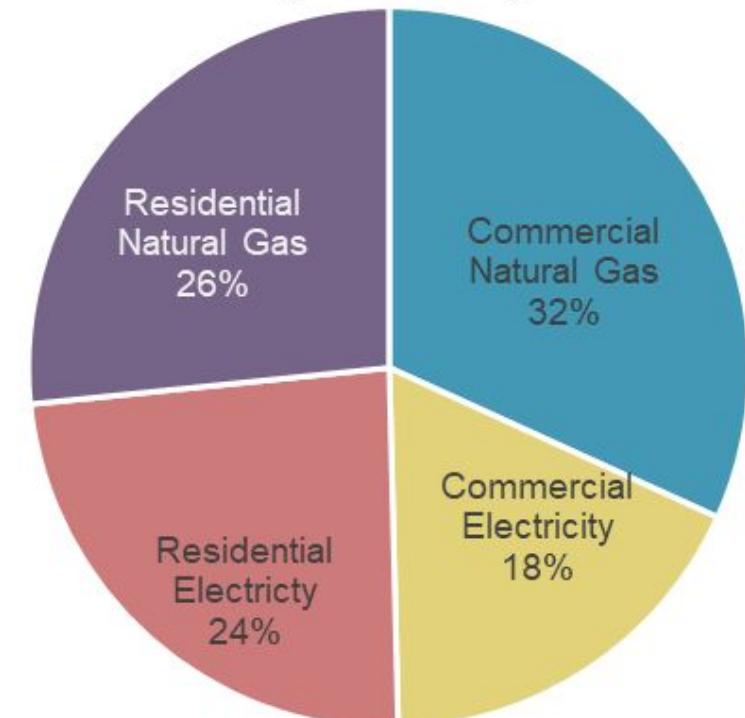


What Buildings Should Be Covered?

Energy Use by Building Type
(kBtu/Yr)

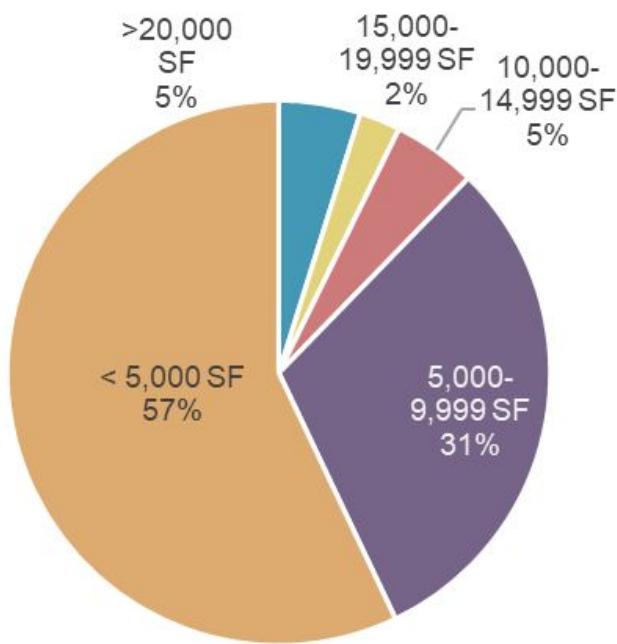


Emissions by Building Type
(mtCO₂e)

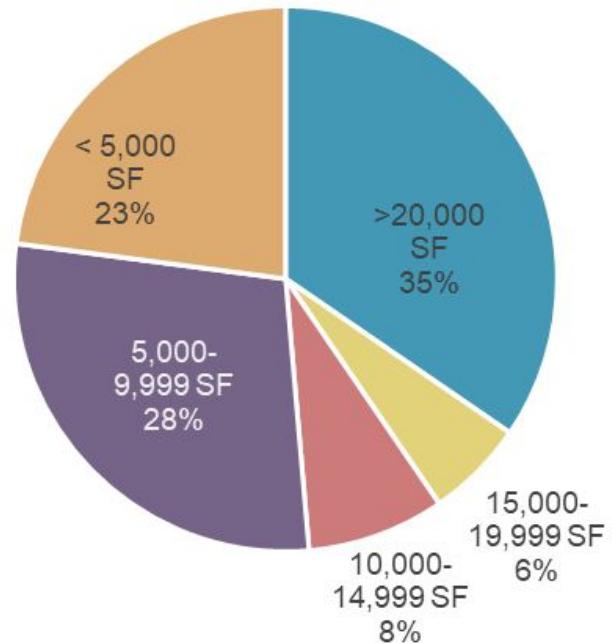


What Buildings Should Be Covered?

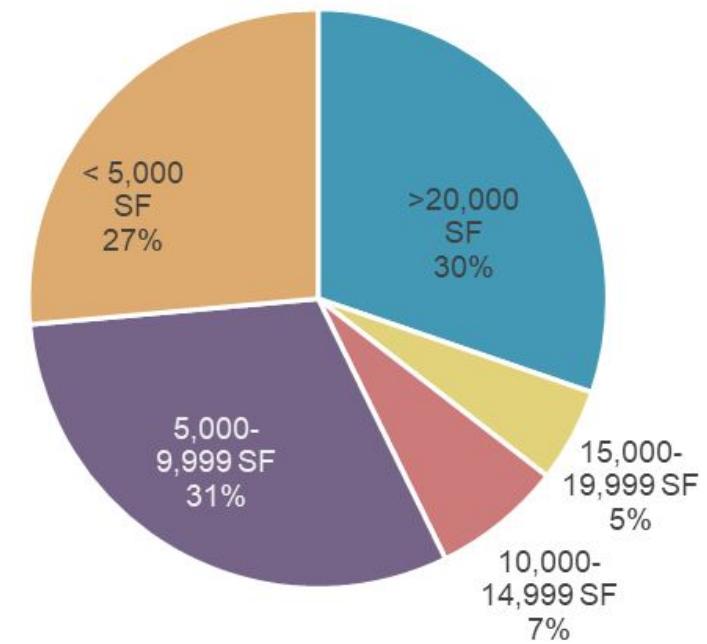
Building Count (#)



Building Area (SF)

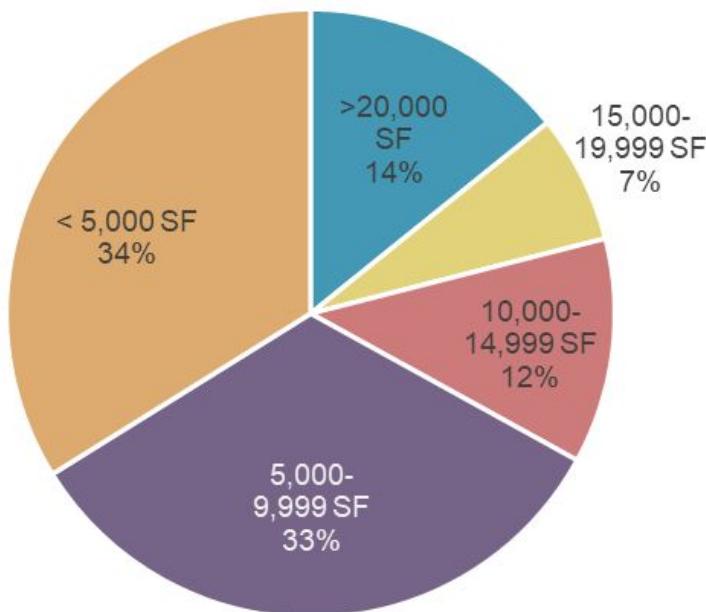


Emissions (mtCO2e)

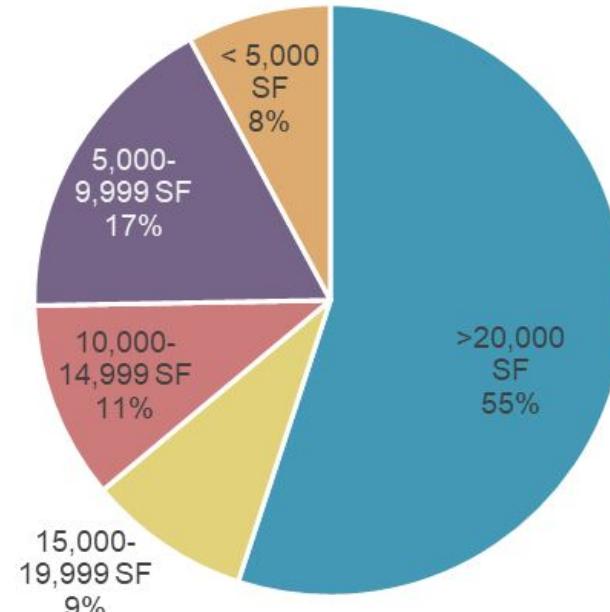


What Buildings Should Be Covered?

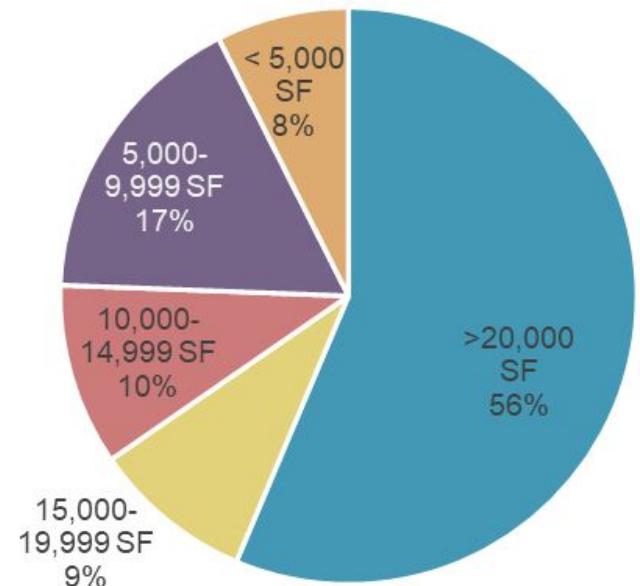
Commercial Building Count (#)



Commercial Building Area (SF)

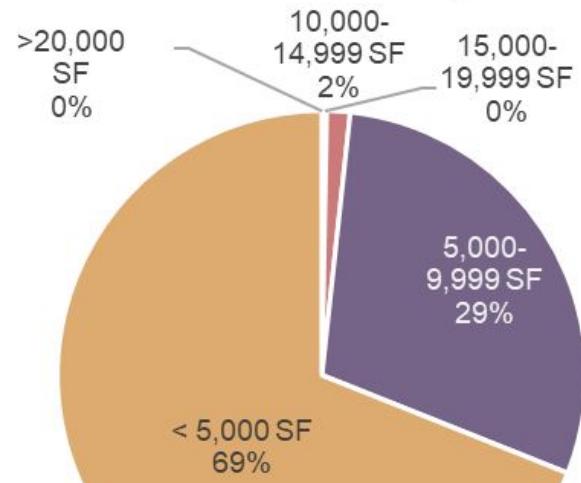


Commercial Emissions (mtCO₂e)

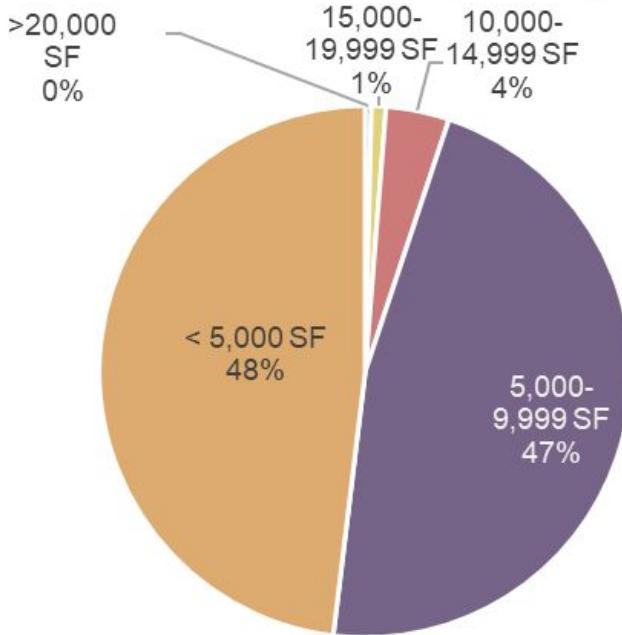


What Buildings Should Be Covered?

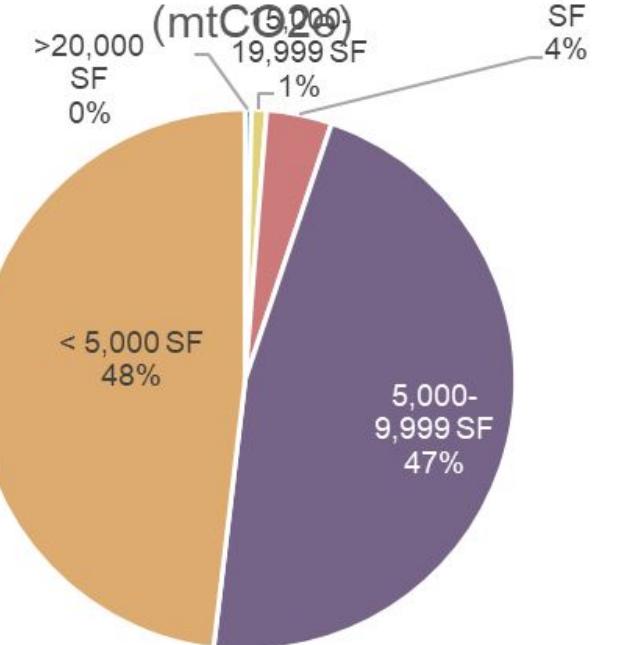
Residential Building Count (#)



Residential Building Area (SF)



Residential Emissions (mtCO₂)



Key Takeaways

1. Building emissions are **50%** from commercial and **50%** from residential
1. **57%** of buildings are under 5,000 square feet (SF) and make up 27% of the City's building emissions
1. 5,000-9,999 SF buildings make up the **largest** percentage of emissions (31%), followed closely by buildings **greater** than 20,000 SF (30%)
1. Of buildings between 5,000-9,999 SF, **63%** of them are residential



COMMITTEE QUESTIONS / THOUGHTS?



Key Elements of BPS Energy Efficiency Guidelines: Part 2

1. Building sizes
2. Building types
3. Targets and how to meet them



Impact of Energy Efficiency

City of Aspen BPS Tool

Inputs

Building Type

All Buildings

Building Size

All Buildings



Number of Interim Targets

2

Target Years

2027

EUI Reduction Target

0%

2031

2035

0%

0%



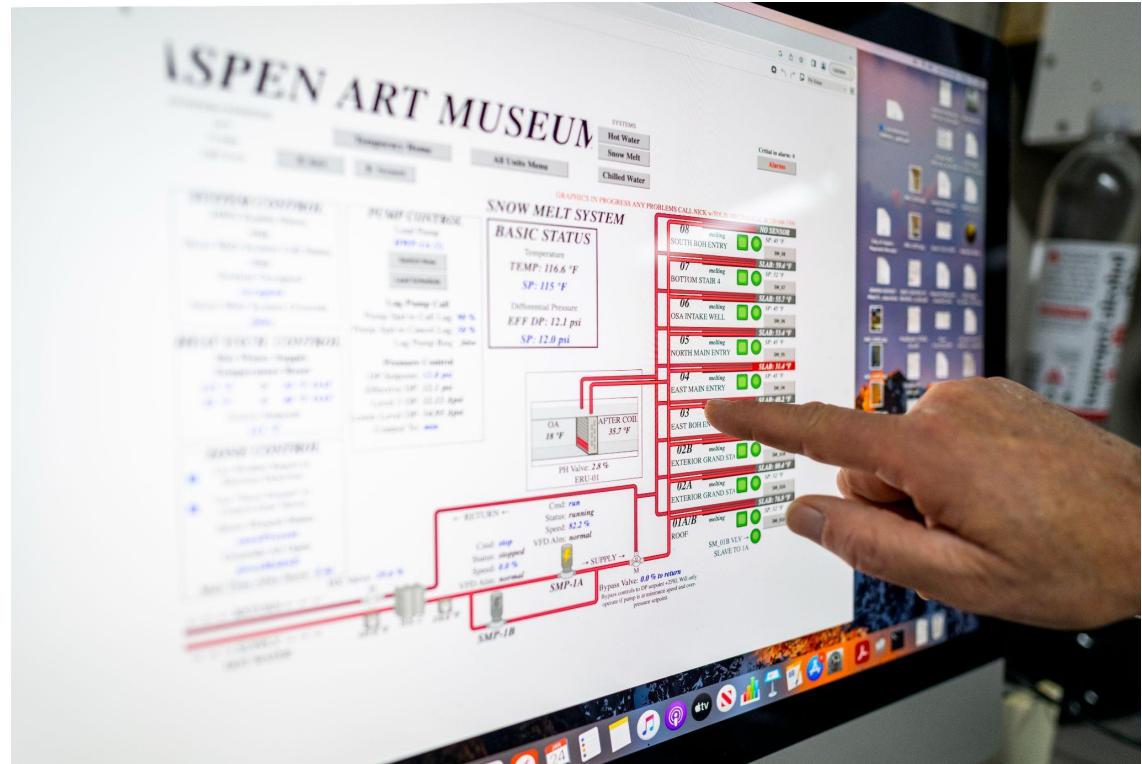
Local Energy Efficiency Projects



Aspen Art Museum Mechanical Room



CITY OF ASPEN



Aspen Art Museum Building Automation System (BAS)

Energy Efficiency (EE) Policy Options

- EUI Targets
- ENERGY STAR Score
- Emissions Targets
- *Prescriptive requirements*

Denver

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EE Policy Options: EUI Trajectory Approach

Pros	Cons
Directly connected to local building data- contextualized for local buildings	Slower rollout: need at least 2 years of benchmarking data for covered buildings
Certainty: everyone knows what everyone's targets are and they are based on on-the-ground data	More complex rollout: need consultant support to create targets for each building type.
Alignment with State of Colorado Policy	Limited data set to develop targets for each building type.



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EE Policy Options: ENERGY STAR Score

Pros	Cons
Quicker rollout: don't need to create individual targets by building type	Some buildings cannot receive energy star score , need alternative compliance pathways
Easy to communicate and understand what makes "good" performance	Uncertainty: meaning of a "score" can change



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EE Policy Options: Emissions Targets

Pros	Cons
Sends unambiguous message to move away from local fossil fuel use	Difficult for building owners and tenants to understand
Directly aligns with community's GHG reduction goals	Without accompanying efficiency metrics, it can result in inefficient electrification (like installing electric resistance heat) and frequently results in increase energy burden on residential tenants
	Difficulty and variety in carbon counting
	May not see operating costs savings



EE Policy Options: Prescriptive Requirements

Examples:

- Energy Audits and Retro-Commissioning
- BAS Upgrade
- LED Upgrades
- Lighting Controls
- Programmable thermostats
- Envelope upgrades
- HVAC Upgrade
- Electrification

Pros	Cons
Straightforward , clear for building owners	Enforcement challenges
Can help reach smaller buildings	Increases complexity of policy
	No tracking towards goals





COMMITTEE QUESTIONS / THOUGHTS?



Small-Group Discussions (~45 min)

- ❖ **Which BUILDINGS should be covered and why?**
- ❖ **What energy efficiency POLICY OPTIONS do you like and why? What should count as meeting the target?**
- ❖ **What will be key CHALLENGES or barriers for buildings to achieve these targets?**



Full Group Discussion

Getting from Here to There...

What types of compliance SUPPORT may be needed to achieve these targets, *in light of the anticipated challenges?*



Working Groups

- Workforce
- Equity and Affordability
- Potentially Water



Draft Work Plan

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Final QUESTIONS / THOUGHTS?





Draft Work Plan



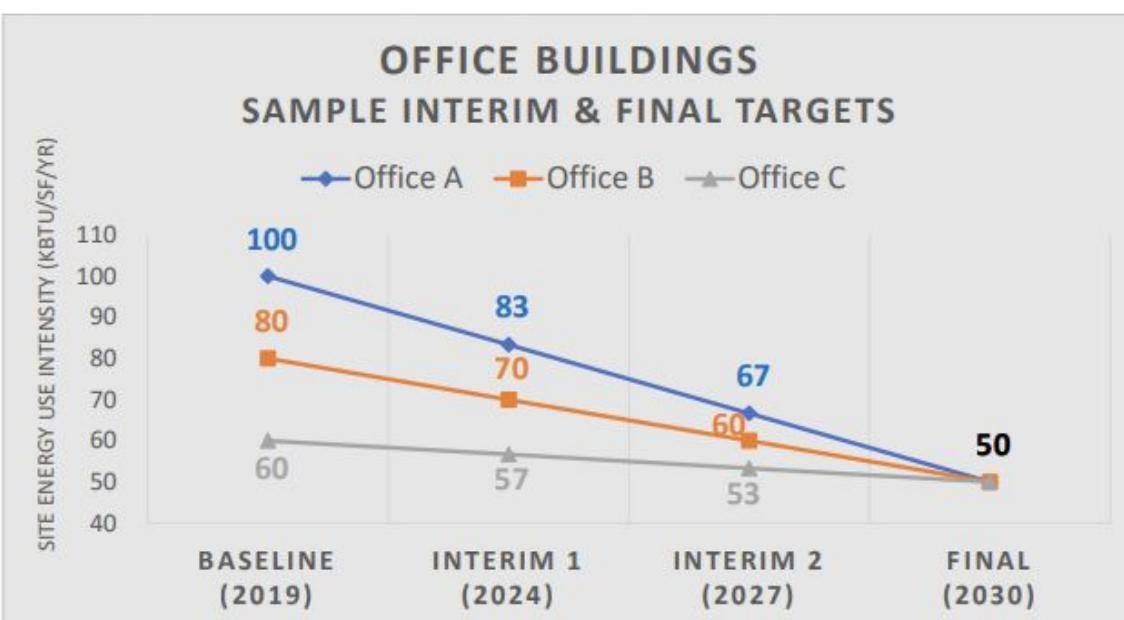
Timeline

-
- visual timeline
 - on top- city wide sbts
 - below - building iq specific timeline
 - 2035
 - potential interim targets- 2027 and 2031 – code/dot
these to note they are still up in the air
 - 2040 - check in
 - what data will have been gathered via benchmarking -
make benchmarking timeline on a hidden slide



Other Cities efficiency targets

- ❖ Denver: Achieving 30% savings is challenging but achievable according to many experts nationally and locally. It is achievable with current technologies and meets the Energize Denver Task Force's goal of feasibility and flexibility as part of the proposed policy. 30% savings means that all buildings will need to perform as well as the top 15% of buildings of that building type by the deadline of 2030. Each covered building will have a baseline EUI based on average historical energy use in 2019. The City should use weather normalized EUI from ENERGY STAR Portfolio Manager. Solar on-site will be fully credited towards energy use, directly lowering the net EUI of the building. Local off-site solar capacity installations and contracts will also be fully credited towards energy use, lowering the EUI. Building owners and managers will self-certify the off-site solar contract. Offsite solar will be revisited every three years by the Technical Advisory Committee as utility-scale solar is increasing. Credit for high performers: The 15% of buildings that already have the target EUI for that building type (or better) will not need to take further action, they will just need to maintain their performance. For buildings where building owners often don't have any control over what energy system are installed per the lease, the City will look further into these lease clauses to determine if we need an exemption for owners in some cases, such as possibly in retail or warehouse buildings.



Other Cities efficiency targets

- ❖ **Denver: 3.3 LIGHTING UPGRADES OR SOLAR FOR BUILDINGS 5,000-25,000 SQUARE FEET**
 - Commercial and multifamily buildings 5,000-25,000 square feet should either certify that they have installed all LED lights or that they have achieved an equivalent lighting power density to what all LEDs would have resulted in. Alternately, the building owner may install solar panels or purchase off-site solar that generates enough electricity to meet 20% of the building's annual energy usage. Buildings will be required to comply by the end of the year listed the following schedule:
 - 2025: buildings 15,001-25,000 square feet • 2026: buildings 10,001-15,000 square feet • 2027: buildings 5,000-10,000 square feet
 - The City should only dedicate resources to the implementation of this requirement that are proportional to the savings it will achieve. This recommendation adds ~1 million metric tons of Page 15 of 36 savings, compared to ~7 million metric tons of cumulative greenhouse gas savings by 2040 from the other energy efficiency and renewable energy policy recommendations above.

3.4 COST-EFFECTIVENESS The simple payback from energy savings for measures most buildings would need to undertake to comply with the above energy efficiency and renewable energy policy is 3-15 years.



Other Cities alt. compliance

- ❖ REQUEST A DIFFERENT COMPLIANCE TIMELINE: APPLY FOR A MORE COST EFFECTIVE TIMELINE TO MEET THE SAME END GOALS
 - End of system life for space and water heating systems that the building owner plans to electrify with heat pumps.
 - Time to refinance the building for affordable housing or other projects with very limited access to capital.
 - Timing of a major renovation.
 - Timing when a major tenant will move out
 - To adjust the timeline, a building owner must submit a plan for an alternate timeline to reach the same end goal. The requirements for a plan should be relatively simple, but the penalties should be higher than under a normal timeline if the goal is not met. Plans should provide:
 - The reason for the requested delay.
 - A retrofit plan with planned project dates and an energy model showing the results of the future planned project and how it meets the required EUI reduction.
 - Documentation that all reasonable efficiency improvements have already been undertaken given the reasons for the requested delay. For example, if a building owner is waiting for the end of space or water heating systems to electrify those systems, and expecting the energy savings from those system replacements, they must still demonstrate that quick payback items such as LED lighting upgrades, VFD and motor upgrades and controls upgrades have been completed. They also must demonstrate the reason why solar cannot be installed to meet the interim target.
- ❖ ADJUST THE END GOAL: DUE TO INHERENT CHARACTERISTICS OF THE BUILDING OR A SUBSTANTIAL CHANGE IN USE
 - Denver should develop a standard application process through which building owners and managers can apply to adjust their performance target to account for significant variations in occupancy type, operating hours, or other operations of the building or inherent characteristics of the building itself that make achieving the target challenging. For example, a building owner or manager could use this process to adjust their target if a new data center moved into a building that was previously office space which used significantly less electricity. A standard analysis should be developed that a building owner must hire an engineer to complete. The final target EUI, as well as the interim targets, for a building may be adjusted up (or down) based on the analysis
- ❖ PRESCRIPTIVE OPTION (2024, 2027): FOR 25,000-100,000 SQUARE FOOT BUILDINGS
 - To get buildings under 100,000 square feet on the path, a prescriptive option will be available in 2024 and 2027 to meet interim targets, but not for final 2030 targets. If a building electrifies space and water heat (partially or fully) through the use of heat pumps and verifies they have all-LED lights, they would then be in compliance with interim targets, regardless of EUI. Just doing these two things will result in 25-35% savings. This gets most buildings well on the way to performance. Building owners will need to self-certify that heat pumps are the primary source of space heat, that all hot water is provided by a heat pump, and that all lights in the building are LEDs. They also will need to report the year when each piece of equipment was installed so the City can check benchmarking data for verification. The City should also conduct on-site audits of a statistically significant number of buildings to verify compliance



to implement this we will need alternatives and support. Frame high level discussion: we need these types of supports. 20 min conversations so we can do work between now and march meeting to give

NEXT MEETING (BY ZOOM)

February 28, 2023 @ 12:00-2:30pm

TOPICS:

- ❖ Which **buildings** are covered by the BPS
- ❖ Energy **efficiency** – interim targets + alternative compliance options
- ❖ Begin discussing **incentives / support** needed for buildings to be able to comply
- ❖ Begin to discuss **workforce** needs
- ❖ Discuss potential **work groups**

HOMEWORK:

- ❖ How do you communicate with your peer community? **Due Feb. 14th**