POLICY OPEN HOUSE #2

Reducing carbon emissions from existing large buildings

September 28, 2020

Reunión de puertas abiertas #2

Para desarrollar una nueva política para descarbonizar grandes edificios existentes

28 de septiembre de 2020

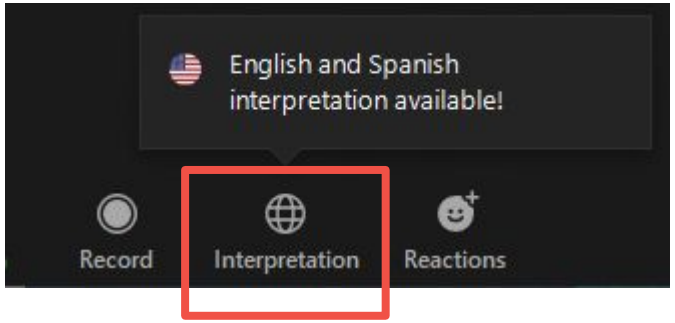
Mayor Martin J. Walsh

ZOOM MEETING GUIDANCE

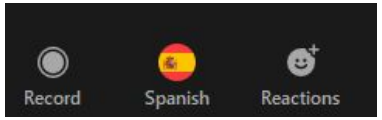
Instrucciones de reunión Zoom

Spanish interpretation is available for this meeting. Please select your preferred language option at the bottom of the screen by clicking on the globe symbol.

NOTE: EVERYONE MUST SELECT A LANGUAGE.



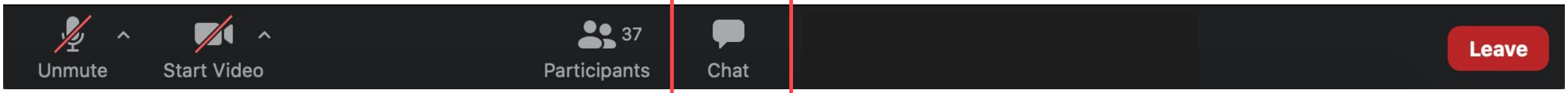
Hay interpretación al español disponible para esta reunión. Seleccione la opción de idioma que prefiera en la parte inferior de la pantalla haciendo clic en el símbolo del globo.



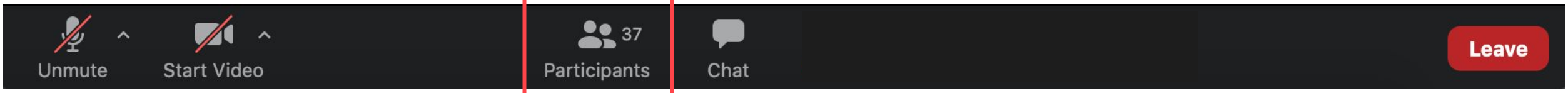
ZOOM MEETING GUIDANCE

Instrucciones de reunión Zoom

- Presentation followed by breakout discussions and comments.
- During the presentation, all microphones will be muted.
- If you are experiencing technical issues or have a clarifying question about something in the presentation, please let us know using the chat function.



- You can also let us know you're having an issue or ask a question by "raising your hand". Click on "Participants" then "Raise Your Hand" in the pop-up window, either by hovering on your name or at the bottom of the window.



MEETING RECORDING

Grabación de la reunión

We are going to be recording this meeting. The recording will include the presentation, any Q&A received during the meeting, and the report-outs from the breakouts at the end.

We are not recording the breakout sessions.

If you do not wish to be recorded during the meeting, please turn off your microphone and camera.

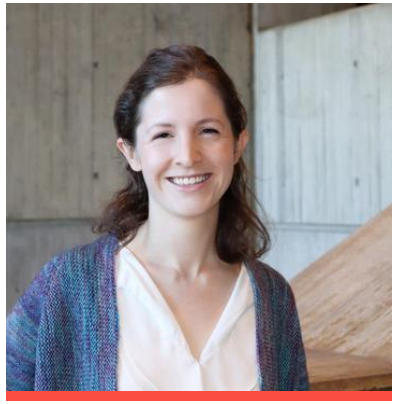
MEETING AGENDA

Agenda de la reunión

- **6:00-6:10**
  - *Welcome & introductions*
- **6:10-6:55**
  - *Group presentation*
  - *Questions & answers*
- **6:55-7:20**
  - *Breakout discussions*
- **7:20-7:30**
  - *Report-outs*
  - *Next steps*

SPEAKERS AT TODAY'S OPEN HOUSE

Ponentes en la reunión de hoy



KAT ESHEL

Carbon Neutrality Program Manager

ALISON BRIZIUS

Director of Climate and Environmental Planning

ANDREA ATKINSON

Executive Director, One Square World

PHILIP EASH GATES

Senior Associate, Synapse Energy Economics

Interpretation services provided by Erika Perez. | Servicios de interpretación proporcionados por Erika Perez.

BREAKOUT DISCUSSION FACILITATORS

Facilitadores de discusión

HOW TO DECARBONIZE A BUILDING

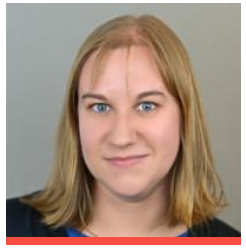
BEN SILVERMAN

Climate & Buildings Program Manager

PHILIP EASH GATES

Synapse Energy Economics

FINANCING RETROFITS



BRENDA PIKE

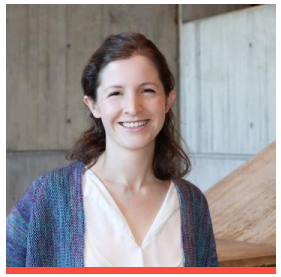
Climate Advisor

EXTENDED TECHNICAL ANALYSIS Q&A

ALISON BRIZIUS

Director of Climate and Environmental Planning

DESIGNING FOR EQUITY



KAT ESHEL

Carbon Neutrality Program Manager

ANDREA ATKINSON

Executive Director, One Square World

PRESENTATION

Presentación

PRESENTATION OUTLINE

Resumen de la presentación

- **Recap of the policy concept and goals**
- **What we heard at the first Open House**
- **Update from the Technical Advisory Group**
- **Update from the Resident Advisory Group**

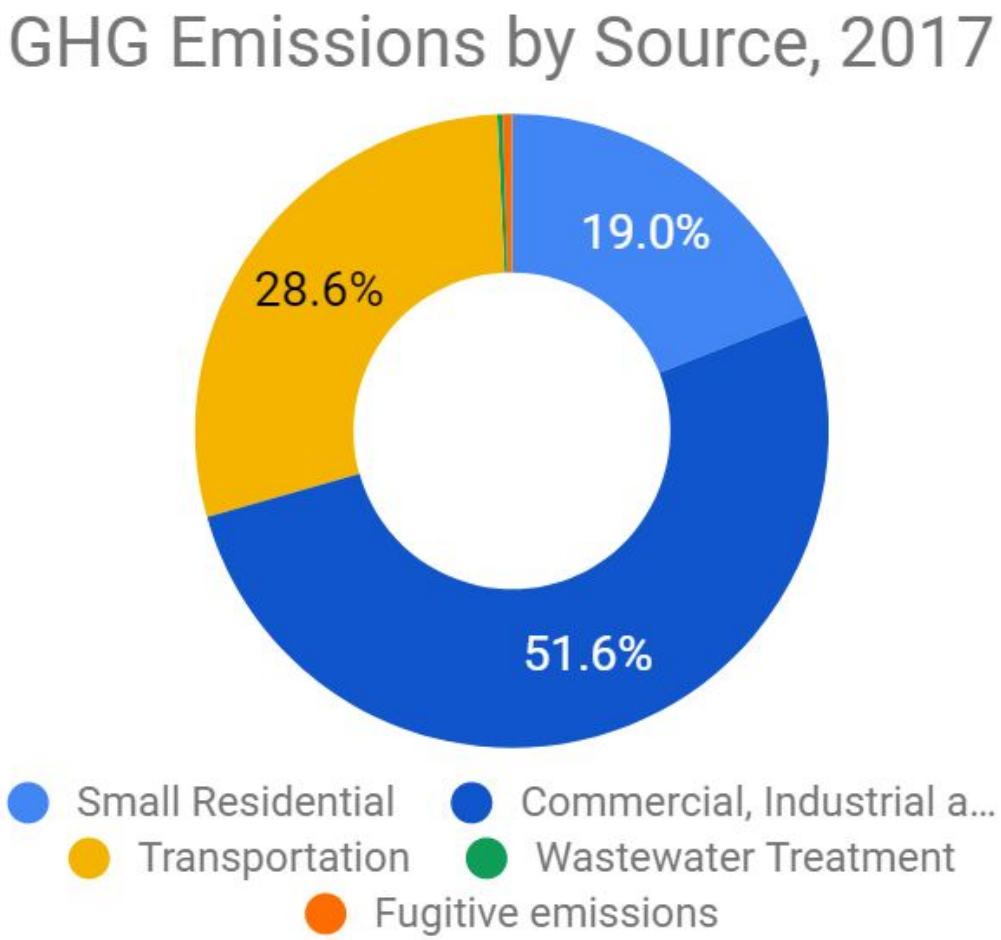
POLICY RECAP

Resumen de la política

Mayor Martin J. Walsh

ACTION IS NEEDED

Se necesita acción



Carbon emissions are changing our climate and causing sea level rise, extreme heat and stormwater flooding in Boston.

Buildings account for 70% of our emissions. Our emissions are not decreasing fast enough.

We need to accelerate carbon reductions:

1. Efficiency
2. Electrification
3. Clean energy

CURRENT POLICY CONTEXT

Contexto político actual

Building Energy Reporting and Disclosure Ordinance (BERDO)

1. Buildings over 35,000 square feet or 35 units are required to report their annual energy and water usage to the City each year. Carbon emissions are calculated by Energy Star Portfolio Manager. The City then discloses the energy, water and emissions data publicly.
2. After five years of being covered under BERDO, buildings must show that they have reduced their energy usage, are certified as a highly efficient building, or have performed an energy audit.

There are also statewide programs to support energy efficiency, including Mass Save.

STRATEGY #5: Develop an emissions performance standard to decarbonize existing large buildings

Why?

- Directly targets our largest emissions source
- Gives buildings flexibility in meeting short- to long-term targets and timing their investments

Components:

- Carbon targets that decrease over time
- Explore 20,000 sqft threshold
- Multiple pathways: retrofits, renewable energy purchases, alternative compliance payment....

BUILDING ON "BERDO"

Construyendo sobre la base de "BERDO"

A) Maintain

BERDO Annual Reporting Requirement

B) Update

Energy Action & Assessment Requirement

- Staggered timelines
- 2014 base year
- Many pathways: 15% reduction, energy audit, REC purchase, or high performance certification

Building Emissions Performance Standard

- Carbon targets by building type that decrease over time
- Equity focus
- Rules for off-site renewable purchases and offsets

POLICY DEVELOPMENT PROCESS

Proceso de desarrollo de la política

CITY *of* BOSTON

Project team

Synapse Energy Economics, Inc.

ONE SQUARE WORLD

ACE alternatives for community & environment
Building Power for Environmental Justice

Technical Advisory Group

Carbon targets
Building pathways
Cost analysis

Resident Advisory Group

Policy principles
Maximize opportunities
Health outcomes

Advise & Inform

Building Owners

Commercial Tenants

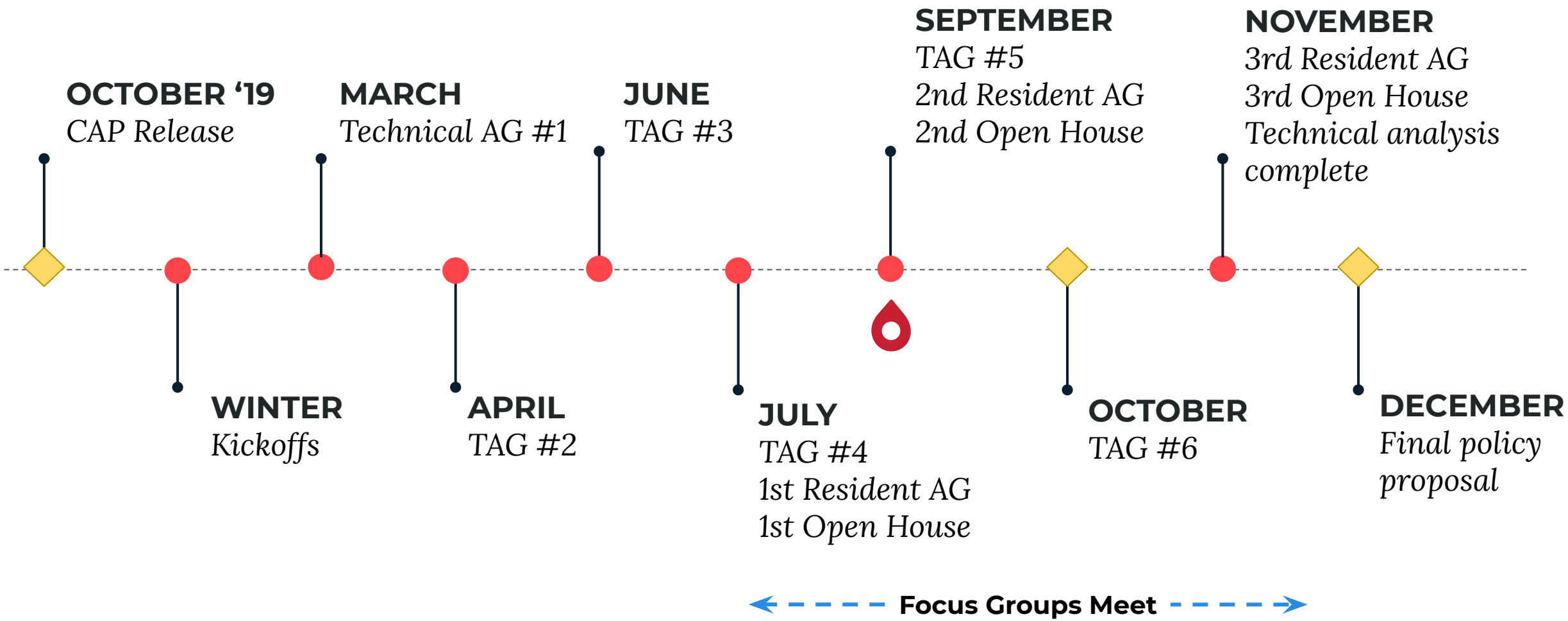
Labor

etc.

Community Open Houses

PROJECT TIMELINE

Línea de tiempo del proyecto



WHAT WE HEARD IN JULY

Lo que hemos escuchado en julio

Mayor Martin J. Walsh

QUESTIONS SHARED IN JULY

Preguntas compartidas en julio

Building decarbonization: What does electrifying a building look like? How can large institutional buildings electrify heat and hot water? Are there case studies? → Breakout #1: How to decarbonize a building

Impact on residents: How will this improve housing quality? What is the potential impact on displacement or housing costs? Will this result in high-quality jobs for residents? Who will bear the costs? → Breakout #2: Designing for equity

Financing: How do we finance this work? How does this fit into building investment and financing cycles? What new financing options can we imagine? What does a climate bank look like? → Breakout #3: Financing retrofits

Technical questions: carbon targets; site/source emissions; cost/benefit analysis; multi-use buildings; compliance timeline → covered later today, Breakout #4: Extended technical analysis Q&A

QUESTIONS SHARED IN JULY

Preguntas compartidas en julio

Policy-specific questions → For discussion during the next Open House

- What is the standard's legal authority?
- Will Renewable Energy Certificates be allowed?
- Will there be exemptions or waivers?
- How will the standard treat portfolios or campuses?
- How can we ensure data accuracy and quality control?
- What will enforcement look like?
- What incentives can be made available or promoted by the City?
- How does this interact with other local and state policies and programs (zoning, Mass Save…)?

CONCERNS AND OPPORTUNITIES SHARED IN JULY

Preocupaciones y oportunidades compartidas en julio

CONCERNS

- Potential impact on residents
- Strength of enforcement
- Potential impact of lowering threshold (limited building manager capacity)
- Confidence in building technology
- Transparency and accountability
- City capacity

OPPORTUNITIES

- Lower threshold (more efficient buildings benefiting more Bostonians)
- Buildings in need of efficiency
- Regional collaboration
- Education and training opportunities
- Job opportunities

TECHNICAL ADVISORY GROUP UPDATE

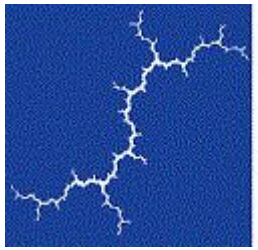
Actualización del Grupo Asesor Técnico

Mayor Martin J. Walsh

TECHNICAL ADVISORY GROUP

El Grupo Asesor Técnico

- **The City has convened a Technical Advisory Group (TAG)** of Boston area experts. The TAG includes experts in building science, architecture, engineering, construction, operations, energy policy, renewable energy, and sustainability.



Synapse
Energy Economics, Inc.

- **The TAG is tasked with providing expertise on:**
  - *Appropriate carbon performance metrics and targets*
  - *Retrofit strategies and costs, appropriate use of off-site renewable energy and offsets*
  - *Data, case studies and expertise (e.g., technical potential for energy conservation measures, cost data, financing approaches)*
- **The TAG has met 5 times and will conclude by November.**

PROCESS OVERVIEW

Vista general del proceso

1. Analyze BERDO data
   a. *Descriptive statistics and data visualization*
   b. *Development of Boston-specific building use typologies*
2. Propose zero net carbon performance policy elements
   a. *Develop building emissions performance targets, forecast resulting emissions reductions*
   b. *Evaluate building size thresholds*
3. Identify decarbonization pathways
   a. *Develop end-use energy/emission and equipment profiles by building type*
   b. *Identify emissions reduction strategies and assess the technical potential*
   c. *Assess impact of alternative energy & offset procurement*
4. Estimate cost impact of performance standard
   a. *Estimate the marginal abatement cost per strategy*
   b. *Identify cost of pathways to zero net carbon across strategies*

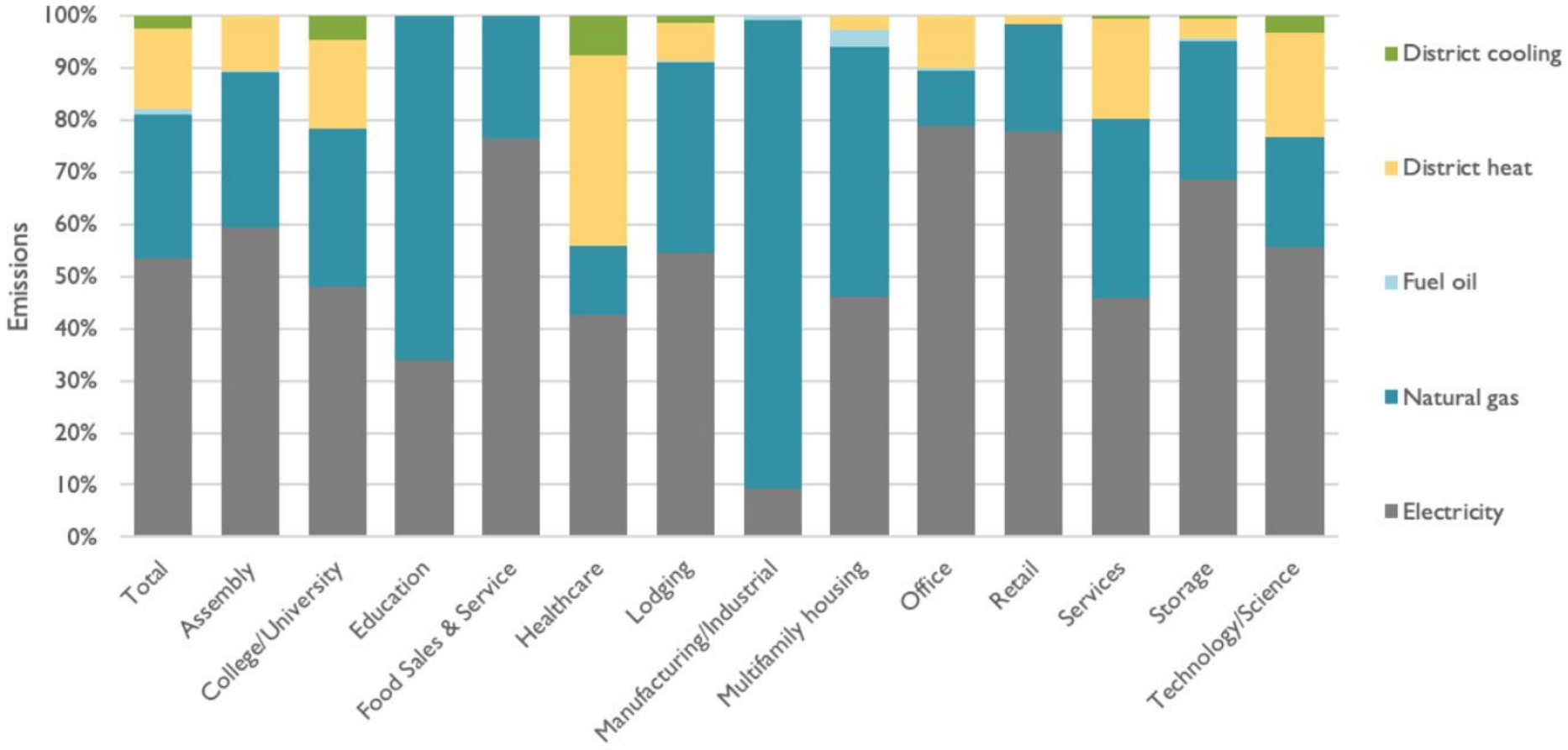
BERDO EMISSIONS BY FUEL

Emisiones BERDO por combustible

Electricity accounts for over half the end-use emissions in 2018.

Data source: BERDO

BERDO emissions by fuel type and building typology, 2018



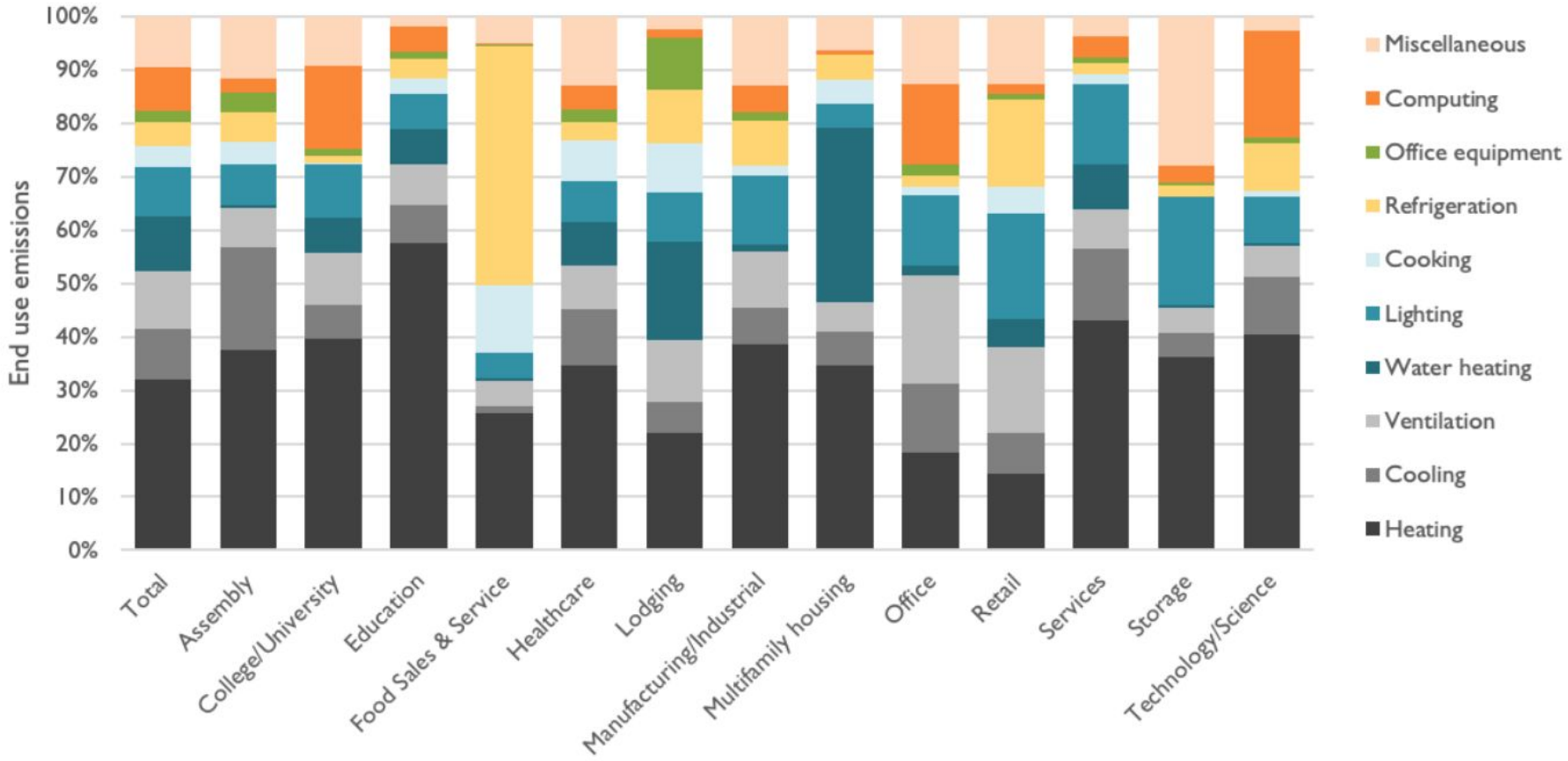
BERDO END-USE EMISSIONS

Emisiones BERDO por uso final

Space heating is the largest source of end-use emissions.

Data sources: BERDO, CBECS, RECS, Cadmus 2012

BERDO end-use emissions by building typology, 2018

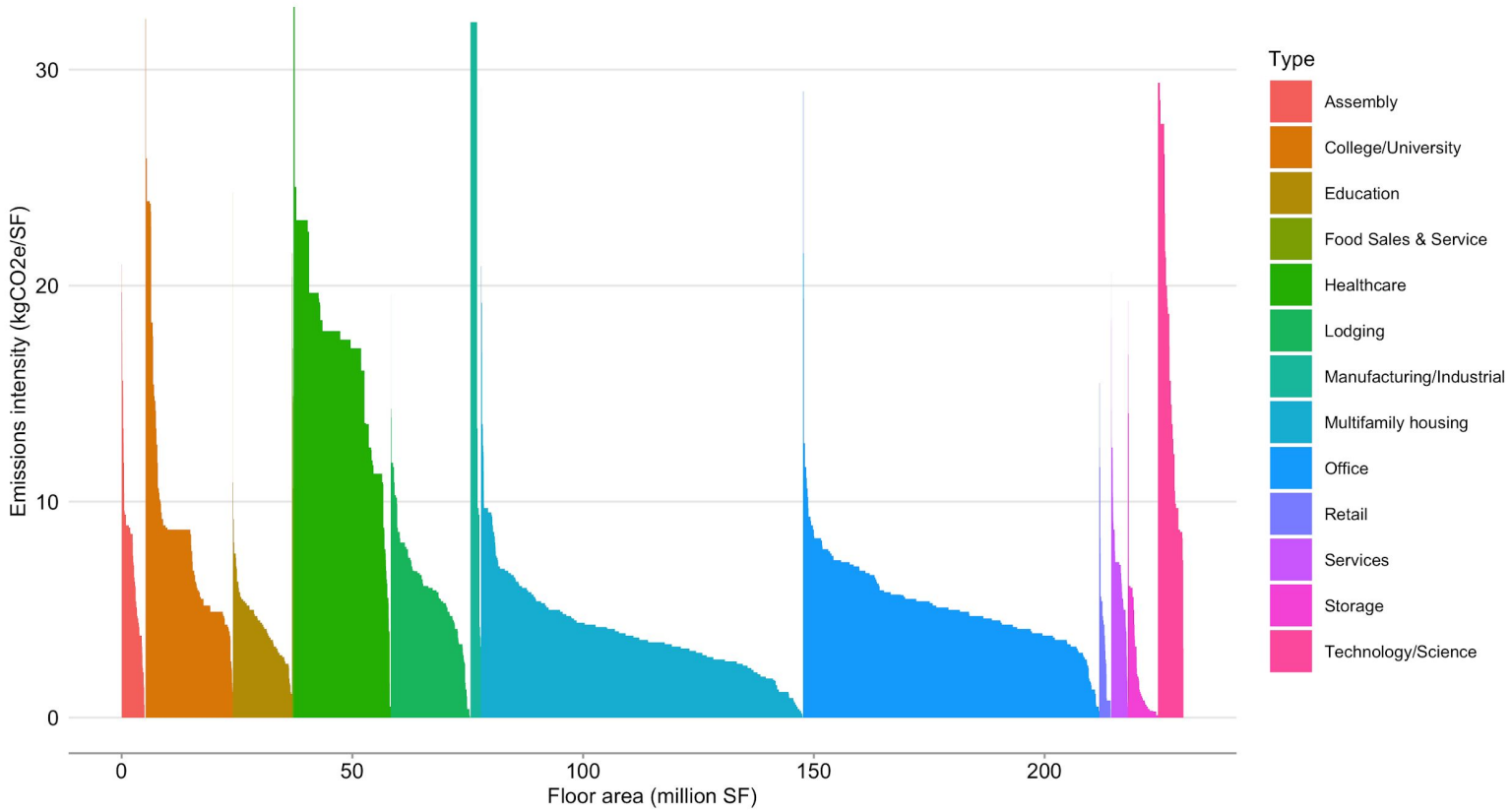


Emissions distribution shape is similar across types.

A few types account for most of emissions.

Limited number of high emissions intensity buildings.

Aggregate emissions in BERDO buildings, 2018



Notes: data points >33 kgCO2e/SF are excluded to improve scale

ZERO NET CARBON PATHWAY

Vía de "carbono neto cero"

Identify technical potential for reducing emissions:

1. Develop Boston building profiles by building type: characteristics, end-use energy, and equipment
2. Identify applicable retrofit measures and abatement strategies
    a. *Select strategies relevant to existing equipment and systems:*
        i. *Deep energy retrofits: thermal envelope, lighting, HVAC, water heating, refrigeration, etc.*
        ii. *Electrification of space heating, water heating, cooking, of district energy systems*
        iii. *On-site renewable installation*
3. Quantify technical potential: estimate performance of existing and future systems
4. Quantify interactive effects between retrofit measure
5. Estimate effect of changing grid emission rates due to state action
6. Quantify green power or other offsets for residual emissions.

PRELIMINARY CARBON TARGETS

Objetivos de carbono preliminares

BUILDING TYPE	EMISSIONS STANDARD (kgCO2e/SF)					
	2025	2030	2035	2040		2050
Assembly	6.9	3.9	2.9		0.9	0
College/University	8.4	4.5		2.2	1.1	0
Education	3.7	2.1			0.5	0
Food Sales & Service	16.2		7.	4.7	2.4	0
Healthcare	14.3	8.8	6.6	4.3	2.2	0
Lodging	5.4		2.4	1.6	0.8	0
Manuf g/Indstrial	22.6	12.9		5.8	2.8	0
Mtifamily hsing	3.7	2.1	1.5	1	0.5	0
Oce		2.8	2.1	1.4	0.7	0
Retl	5.3	2.8	2	1.3	0.6	0
Servs	6.8	3.9	2.9	1.9	1	0
Stora	4.9	2.2	1.5	0.8	0.3	0
Technology/Science	17.3	9.4	6.8	4.5	2.2	0

Targets are:

- Aligned with citywide emissions targets
- Customizable for mixed use buildings

ZNC PATHWAY WITH 2050 EMISSIONS FACTOR

Vía de "carbono neto cero" usando el factor de emisiones de 2050

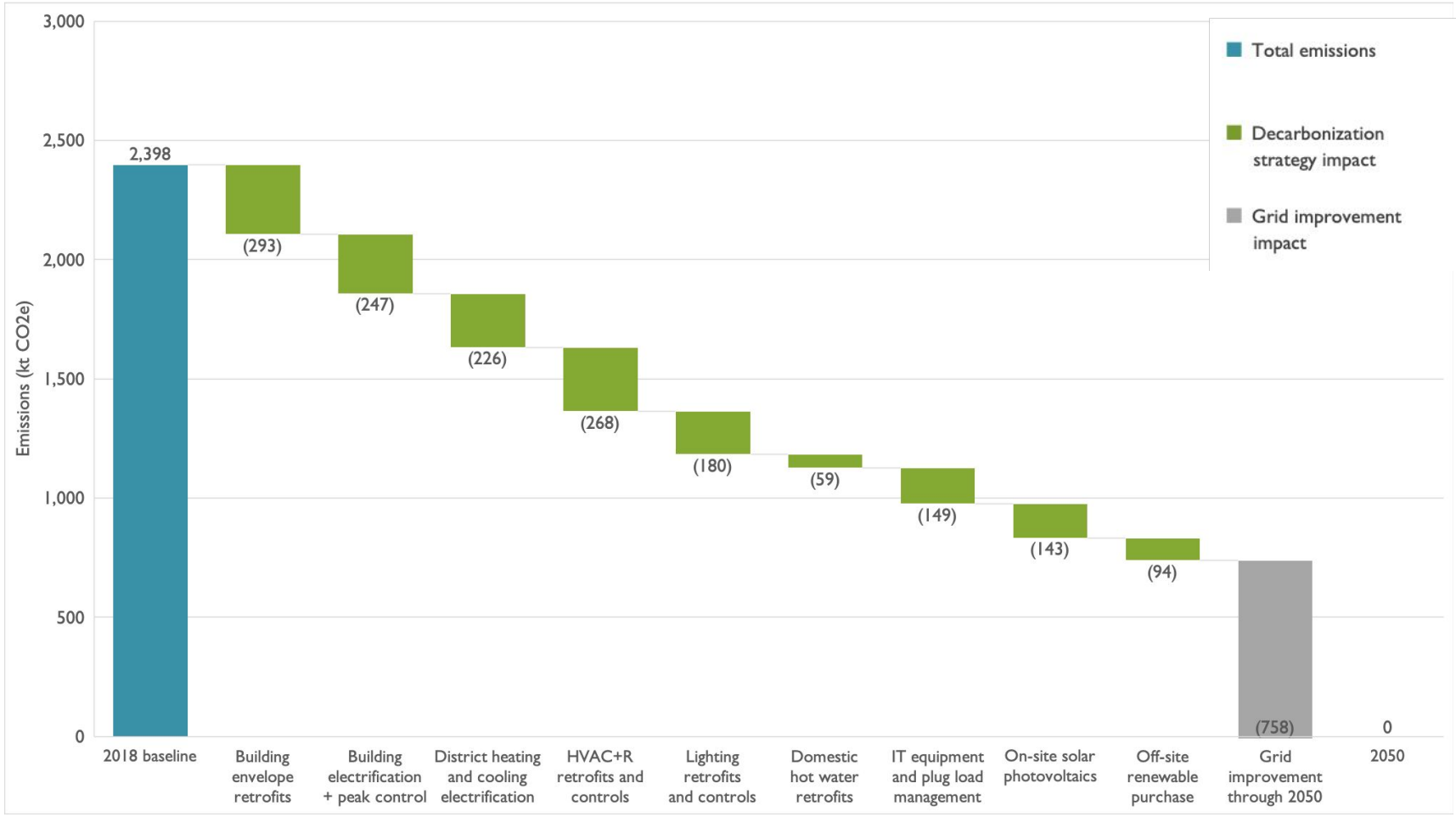
Strategies with greatest emissions reduction:

- Electrification of building end-uses
- Electrification of district thermal
- Building envelope retrofits

Grid improvement:

- Increases the emissions reduction potential of electrification
- Will reduce building emissions by 40% by 2050

Impact of decarbonization strategies for covered buildings (2050 grid emissions factor)



APPROACH TO ESTIMATE ABATEMENT COST

Enfoque para estimar el costo de reducción

1. Identify Boston-specific abatement costs:
   a. ***Energy efficiency measures***: *MassSave program data, local case studies, loca construction cost estimates*
   b. ***On-site renewables***: *MassCEC solar cost database*
   c. ***Off-site renewables***: *Massachusetts REC market prices*
   d. ***Building electrification***: *MassSave program data and literature search*
   e. ***District thermal electrification***: *case studies from Northern Europe and North America*
2. Estimate lifecycle costs
   a. ***Forecast cost of energy*** *through 2050 by fuel type*
   b. ***Quantify lifecycle costs***: *capital investment, O&M, energy, and procurement (i.e., RECs)*
   c. *Identify incremental costs for end-of-life replacement measures and total cost for "retrofit"*
3. Estimate net abatement cost:
   a. ***Quantify costs and energy savings*** *by end use and by strategy*
   b. ***Translate fuel savings into emissions savings*** *by strategy*
   c. ***Estimate average cost per ton*** *to decarbonize Boston buildings*

NEXT STEPS

Próximos pasos

1. Final TAG meeting by November
2. Summarize technical advising for policy framework
3. Finalize performance standard recommendations
4. Finalize cost impact estimate
5. Identify recommendations for future study

RESIDENT ADVISORY GROUP UPDATE

Actualización del Grupo Asesor Residente

Mayor Martin J. Walsh

RESIDENT ADVISORY GROUP

El Grupo Asesor Residente

Goal: Develop a building emissions standard that minimizes harm and maximizes benefits and opportunities for Boston's frontline populations most affected by the proposed policy

Approach:

- *Receive community expertise and feedback*
- *Raise awareness of potential impacts and opportunities*
- *Collaborate with and center communities that will be impacted by the policy*

The first resident advisory group meeting was held on July 27th.

Design Process: RESIDENTS ARE CO-DESIGNERS

Resident Advisory Meeting 1:
Understanding community priorities
“Here are the facts, what would be best for you?”

- Understand the reality.
- Imagine the future.
- Clarify what you definitely want and what you do not.

Policy Development
City & Consultant teams build policy principles based on Resident priorities

Resident Advisory Meeting 2:
Check-in with community on direction of ordinance development
“Is this what you wanted?”

Policy Refinement
based on community feedback

Resident Advisory Meeting 3:
Final review from community
“Here is the final draft! Let’s make it a reality together.”

Boston Building Emissions Performance Standard

Goal: Large buildings must reduce emissions, with the greatest benefit and least harm to Boston residents

The equation:

PART 1:
Bring down fossil fuels in large buildings

+

PART 2:
Benefit to residents

=

The New Boston Building Emissions Performance Standard

What did we hear that residents want?

Carbon reduction in Boston that:

Improves air quality for residents

Reduces renter energy bills

Does not contribute to displacement

Improves heating + cooling in homes

Creates jobs for residents

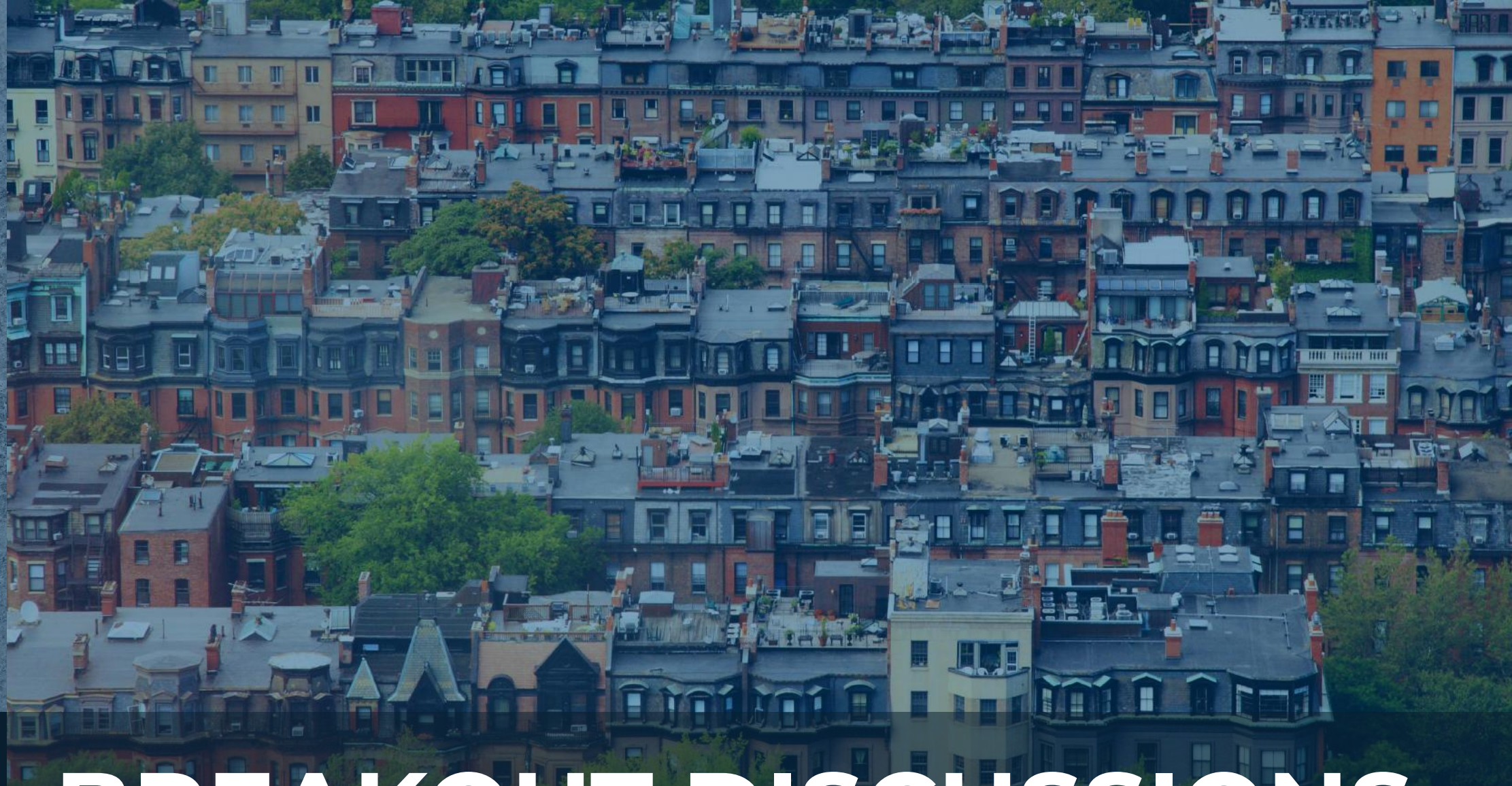
Is good for the environment

Timeline and Next Steps

Community Meeting #1: **Mon 7/27**

Community Meeting #2: **Thurs 9/24**

Residents Meeting #3: **Mon, Nov 16.**



BREAKOUT DISCUSSIONS

Discusiones de grupo

WHAT TO EXPECT IN YOUR BREAKOUT

Qué esperar en su discusión de grupo

- Small group discussions using the “Zoom Room” function.
- During the breakout, you can turn on your microphone and share your video.
- Please click on the three dots at the top right of your video/name screen to include your full name, pronouns and organization if applicable.
- If you have a question or comment but don’t feel comfortable jumping in, you can “raise your hand” or press *9 if you’re calling in.

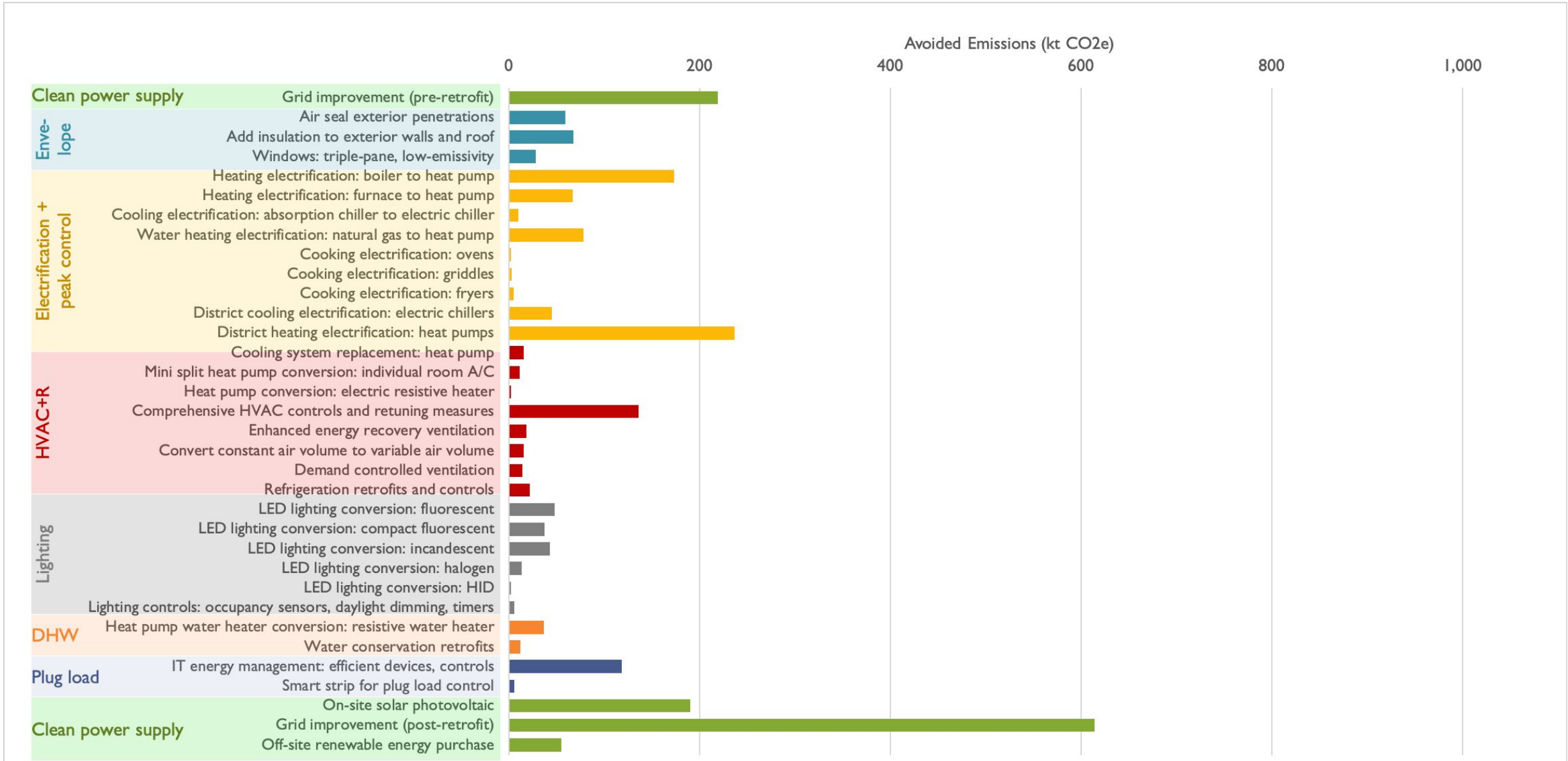
WHAT TO EXPECT IN YOUR BREAKOUT

Qué esperar en su discusión de grupo

- We have prepared a list of questions to get the conversation started.
- A staff member will take notes to record your questions and comments and help facilitate the conversation.
- These questions will help design our next meeting.
- Ways of being:
  - *Speak from the "I"*
  - *Take space, make space*
  - *Actively listen*
  - *Own your intentions and impacts*

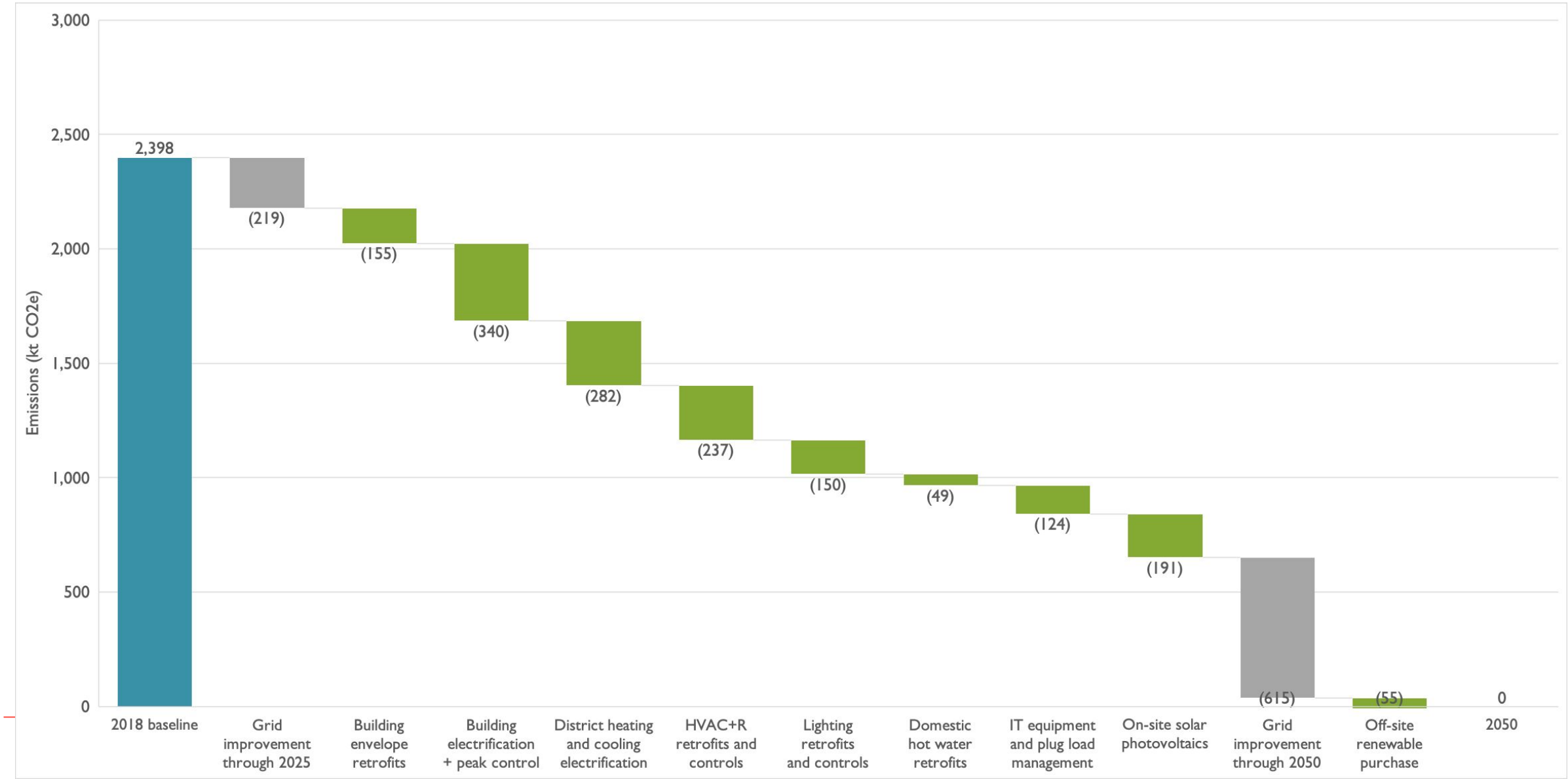
HOW TO DECARBONIZE A BUILDING

Emissions impact of decarbonization strategies for covered buildings (2025 grid emissions factor)



HOW TO DECARBONIZE A BUILDING

Emissions impact of decarbonization strategies for covered buildings (2025 grid emissions factor)



DESIGNING FOR EQUITY

Per the Resident Advisory Group, residents want carbon reduction that...

Improves air quality for residents

Reduces renter energy bills

Does not contribute to displacement

Improves heating + cooling in homes

Creates jobs for residents

Is good for the environment

LEGAL CONSTRAINTS

- Prescriptive versus performance
  - *Ordinance versus regulations versus guidance*
- Limits of the Resident Jobs Policy
- Intersection with housing policy

OPPORTUNITIES

- How should any potential revenue from the standard be used?
- What companion local or state policies are needed?
- How do we measure success?

FINANCING RETROFITS

- **Existing (Resource Hub)**
  - *Incentives*
  - *Financing*
  - *Tax Credits*

- **Exploring**
  - *PACE*
  - *Climate Bank*
  - *Use of Alternative Compliance Payments*

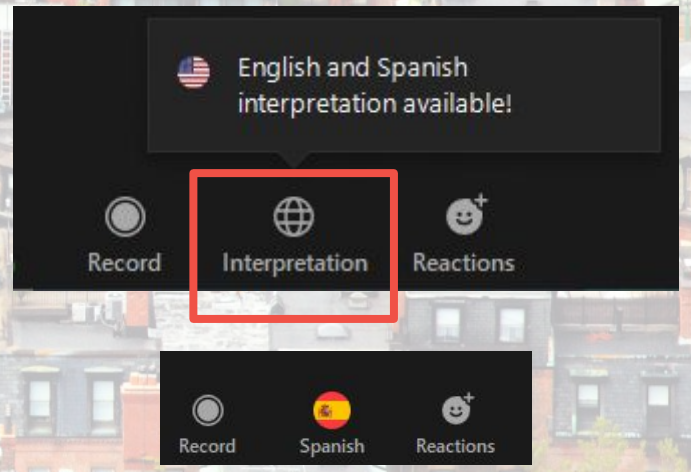
- **What gaps still need to be filled?**

REPORT OUT

Compartir los resultados de la discusión

Please remember to select your language.

Por favor, recuerda seleccionar su idioma.



NEXT STEPS

Próximos pasos

Mayor Martin J. Walsh

NEXT STEPS

Próximos pasos

- The next Open House will take place in November (date to be confirmed).
- The questions and comments you shared today will continue to shape the agenda and structure of these meetings.
- To share additional feedback, please respond to our survey (link shared in the chat and to be emailed after the end of the meeting).
- We will continue to update our website with up-to-date information.

UPCOMING EVENTS - BOSTON.GOV/EVENTS

Próximos Eventos - boston.gov/events

Wednesday, Sept 30
7:00pm-8:00pm

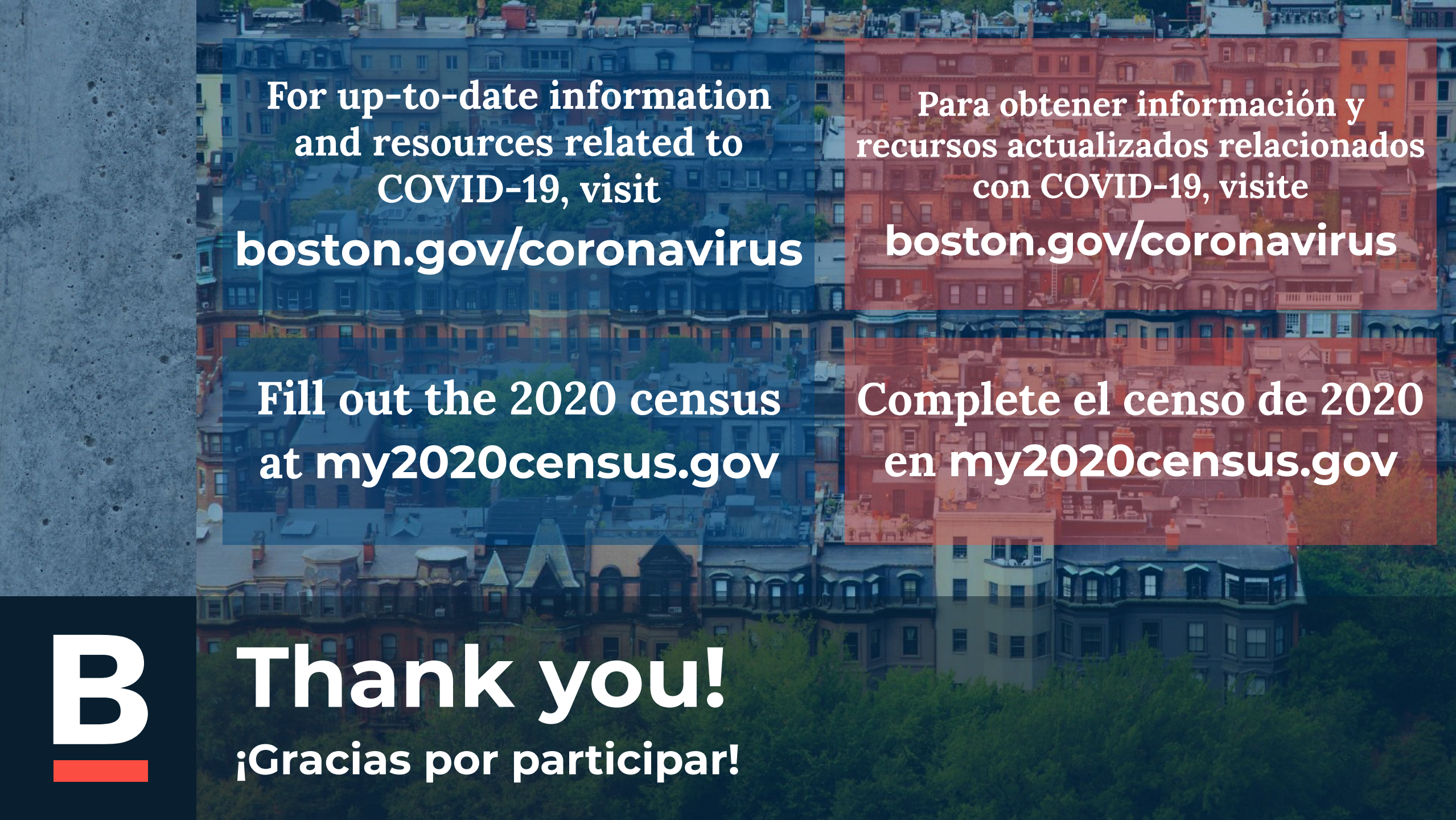
ZERO NET CARBON BUILDING ZONING

BPDA Event

Online registration

ENERGY JUSTICE WEBINARS: PROTECT YOUR ELECTRIC ACCOUNT

- Tuesday 9/24, 6-7:30pm (Cantonese/廣東話, CART, ASL)
- Thursday 10/1, 6-7:30pm (Spanish/español)
- Tuesday, 10/6, 6-7:30pm (Vietnamese/Tiếng Việt)
- Thursday, 10/8, 6-7:30pm (Haitian Creole/kreyòl ayisyen, ASL, CART)


For up-to-date information and resources related to COVID-19, visit
boston.gov/coronavirus
Para obtener información y recursos actualizados relacionados con COVID-19, visite
boston.gov/coronavirus
Fill out the 2020 census at my2020census.gov
Complete el censo de 2020 en my2020census.gov
Thank you!
¡Gracias por participar!