

BERDO 2.0 REGULATIONS - PHASE 2 APCC SPECIAL HEARING

September 28, 2022



This public hearing will include opportunity for public comment. During public comment periods, members of the public may submit any comments or questions by “raising their hand” or by typing in the chat box.

AIR POLLUTION CONTROL COMMISSION



Vineet Gupta

*Director of Planning,
Boston Transportation
Department (ex officio,
representing Brad Gerratt)*



**Alison
Brizius**

*Environment
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**Julien
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Agenda

- **BERDO 2.0 Reporting Update**
- **BERDO 2.0 Regulations Development Process**
- **Preliminary regulations proposals**
 - *Commission Q&A on regulations proposals*
 - *Public Q&A on regulations proposals*
- **Environmental justice metrics**
 - *Commission Q&A on environmental justice metrics*
 - *Public Q&A on environmental justice metrics*

BERDO 2.0 Update

Reporting and Compliance to date

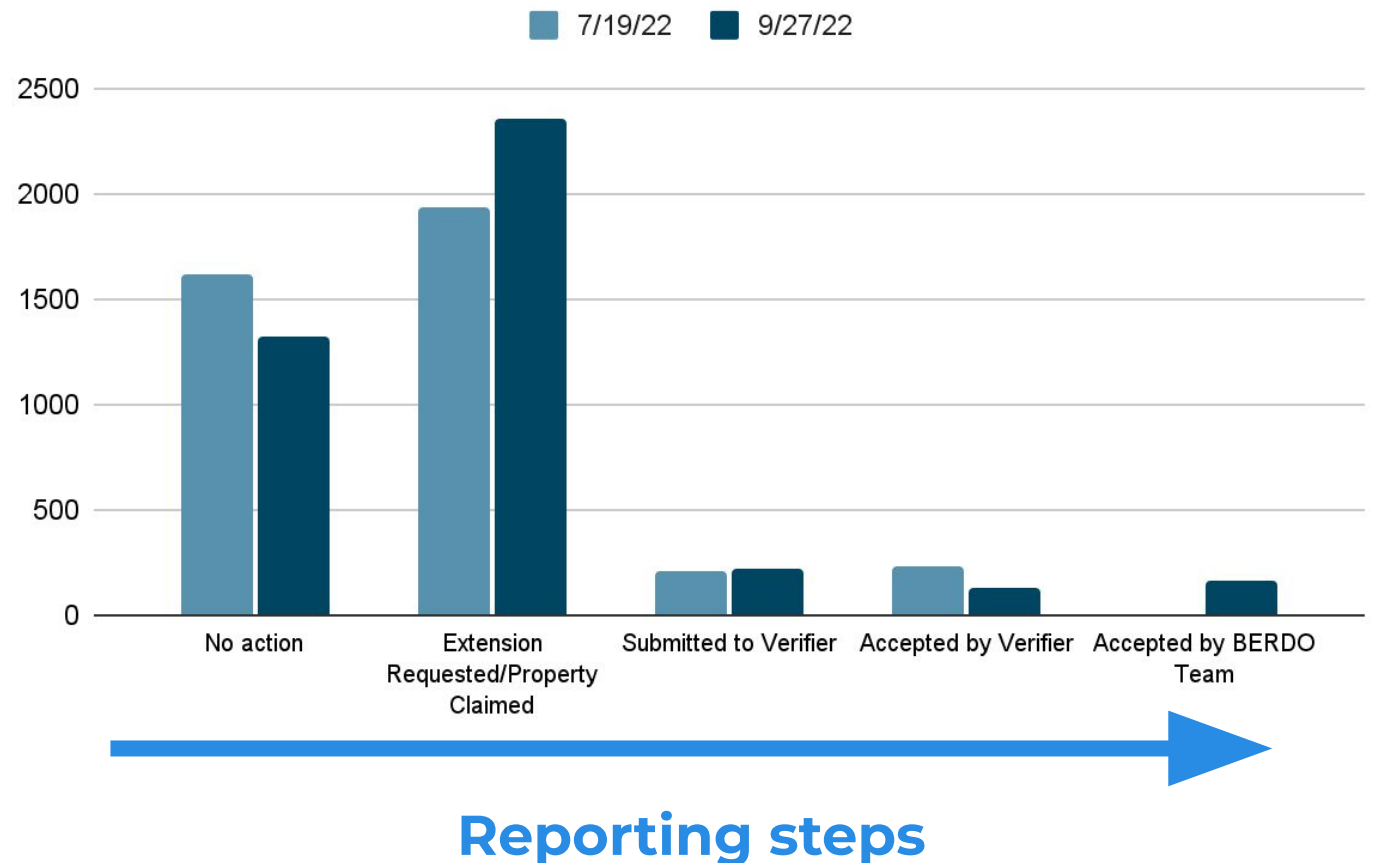


Reporting Progress



- **Reporting Numbers (as of 9/27)**
 - 3969 properties (parcels)
 - 67% have initiated reporting (up from 59% in July)
- **Data validation checks on third-party verified reports are in progress.**
 - *First 150+ reports accepted by BERDO team.*
 - *Several have to fix issues like missing BERDO ID or explain data anomalies.*

Reporting Metrics July and September 2022



Reporting and Compliance Outreach and Support



- **Fielding numerous daily helpdesk calls and emails**
- **Weekly BERDO reporting office hours**
 - *Hosting dedicated sessions on Portfolio Manager and requesting utility data*
- **Issued software RFP for data and helpdesk management platform.**
 - *Goal is to have new platform set up for 2023 reporting season.*
- **Outreach to building owners**
 - *Letter to condo owners: 700 letters sent last week. A second batch will be sent in the next 1-2 weeks.*
 - *BERDO fellows are doing direct outreach to property managers and owners*
 - *1330+ reached out to be email or phone*
 - *300+ contacted within the last 2 weeks*

BERDO 2.0 Regulations

Approach for regulations development



Regulations Development Process

Phased approach by key topics



Phase 1

- ***Adopted in March 2022***
- *Reporting and data verification requirements*

Phase 2

- *Review Board regulations*
- *Emissions factors*
- *Renewable energy purchases*
- *Blended emissions standards*
- *Designating tenant as owner, change of ownership, and other clarifying regulations as needed.*

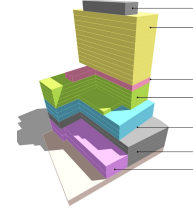
Phase 3

- *Hardship compliance plans*
- *Individual compliance schedules*
- *Portfolio compliance*
- *Equitable Emissions Investment Fund regulations*
- *Additional regulations as needed to implement and enforce the ordinance*

PHASE 2 Regulations Topics



Review Board



Blended Emissions Standards



Emissions Factors

(Grid Emissions, District energy systems)

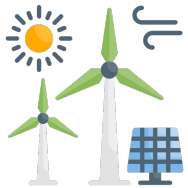


Designating tenant as owner

(Long-term commercial tenants)



Change of ownership



Renewable Energy Purchases

(PPAs, RECs, SMART Program)



Buildings in Special Circumstances

(Vacant buildings, demolitions)

Phase 2 Community Engagement Process



Main components

Community Leads Meetings

Special meetings with community partners

- Advise on community needs and priorities.
- Engage residents.
- Inform and provide feedback on regulations.
- Ensure the regulations and implementation of BERDO are aligned with environmental justice and equity.

Technical Working Sessions

**Public meetings on Zoom
Technical experts invited**

- Provide technical feedback on regulations

Focus Groups

Special meetings to go deep into specific topics

- Convening of specific groups to have in-depth discussions on relevant issues.
- Scheduled as needed.

Air Pollution Control Commission

Public meetings on Zoom

- Series of monthly meetings from September to December.
- City will present proposals and draft language on regulations.
- Commission will provide direction and open public comment periods when appropriate.

Public Meetings to Date

- **Listening Sessions**

- *July 19: Review Board Regulations*
- *August 18: Emissions Topics*

- **Technical Working Sessions**

- *September 7: Blended Emissions Standards, Change of Ownership, Designating a Tenant as “Owner”, and vacant buildings*
- *September 14: Grid Emissions Factors, Renewable Energy Purchases, Fossil Fuel Emissions Factors*
- *September 21: District Energy Emissions Factors*

- **Slides and meeting notes are available on the [BERDO Regulations website](#)**

Community Priorities for BERDO 2.0

What did we hear that residents want?



Boston residents want carbon reduction programs that:



**Improve
air quality
for residents**



**Reduce renter
energy bills**



**Do not contribute to
displacement**



**Improve heating
+ cooling in
homes**



**Create jobs for
residents**



**Are good for the
environment**

The background of the slide is a dark blue wireframe illustration of a city skyline, viewed from an elevated perspective. The buildings are represented by white and light blue lines, creating a complex geometric pattern of rectangles and polygons. The overall aesthetic is modern and architectural.

BERDO 2.0 Regulations

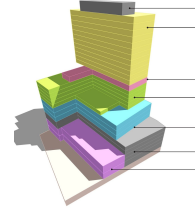
Preliminary Phase 2 Regulations Proposals



PHASE 2 Regulations Topics



Review Board



Blended Emissions Standards



Emissions Factors

(Grid Emissions, District energy systems)

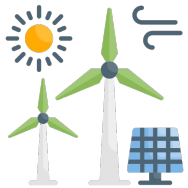


Designating tenant as owner

(Long-term commercial tenants)



Change of ownership



Renewable Energy Purchases

(PPAs, RECs, SMART Program)



Buildings in Special Circumstances

(Vacant buildings, demolitions)

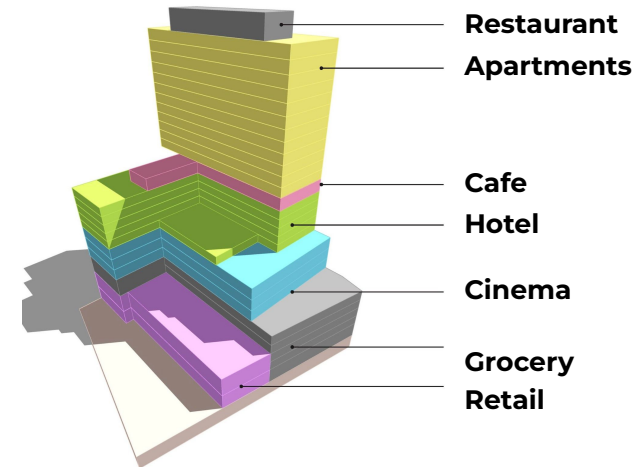
Blended Emissions Standards

Topic #1

When can blended emissions standards be used by building owners?

Per the Ordinance:

- “Buildings or Building Portfolios **with more than one primary use** may comply with a blended CO₂e Emissions standard; provided, however, that a use may constitute a primary use only if it:
 - (i) occupies **at least 10%** of a Building’s or Building Portfolio’s **square footage**, or
 - (ii) accounts for **more than 10%** of a Building’s or Building Portfolio’s total annual **Energy use** or **CO₂e Emissions**.”



Example of building with multiple primary uses

Blended Emissions Standards

Topic #1



Preliminary proposals:

- *Blended emissions standards would require third-party verification every “Verification Year”, as part of the regular verification process (i.e., starting in 2026 and every 5 years thereafter).*
- *Owners may update, opt-in, or opt-out from a blended emissions standard every “Verification Year” (i.e., starting in 2026 and every 5 years thereafter).*
- *If primary uses change, owners may update their blended emissions standard before a “Verification Year”, and this updated standard would require third-party verification.*
- *To verify their primary use(s), Owners would need to provide:*
 - *Gross Floor Area as listed in City of Boston Assessing Department records; or*
 - *Building Documentation such as Blueprints, Architectural Plans, or Project Capital Needs Assessments, if calculating alternative Gross Floor Area.*

Change of Ownership

Topic #2



Preliminary proposals:

- *If a Building changes ownership, any outstanding Compliance obligations and liabilities shall become the responsibility of the new Building Owner.*

Designating Tenant as Owner

Topic #3

Preliminary proposals:

- *This process would require submitting a letter of agreed designation to the Environment Department, signed by **both** the Building Owner and the lessee.*
- *When lease ends, the responsibility of compliance and any outstanding obligations would revert back to the Building Owner.*

Buildings in Special Circumstances

Topic #4

Preliminary proposals:

Vacant buildings

- A Building that **was not occupied**, did not use **any utilities for all 12 months**, and did not have an **active certificate of occupancy (COO)** for the relevant calendar year would not be required to report for that year.
- Third party verification would not be required until the first year after receiving a COO.
- Verification would be required on reported data prior to utility shut-off.

Building demolitions

- Buildings with **demolition permits** will need to report under BERDO and provide third party verification for the relevant calendar years in which the building was still in operation.
- Following demolition, any new covered buildings on the parcel would need to follow the requirements of the Ordinance.
- Buildings with active demolition permits would **not** need to provide third-party verification for **2022**.

Grid Emissions Factors

Topic #5

There are two types of grid emissions factors to consider:



**Forward-looking
emissions factor for
planning purposes**



**Annual emissions
factor for compliance
with BERDO 2.0**

- Forward-looking grid emissions factors are important to enable building owners to plan investments in energy efficiency, electrification, and renewable energy procurement.
- Annual grid emissions factors are needed for compliance with BERDO each year.

In calculating these emissions factors, we need to balance providing **certainty** to building owners on their emissions and ensuring **accuracy** for emissions accounting and compliance.

Grid Emissions Factors

Topic #5



Preliminary proposals (Part 1):

- The City of Boston will provide estimated **forward-looking grid emissions factors for planning purposes**.
 - Forward-looking emissions factors will be based on ISO NE projections.
 - These emissions factors shall not be used for compliance.
- Each year, the City of Boston will release an **annual grid emissions factor for compliance with BERDO 2.0**.
 - This annual grid emissions factor will be based on real data published by ISO NE and any other relevant governmental sources for the compliance year.
 - We expect this emissions factor would become available during the first 1-3 months of each year, before the compliance deadline of May 15.
 - This will be the default emissions factor used for compliance.

Grid Emissions Factors

Topic #5



Preliminary proposals (Part 2):

- Subject to approval by the Environment Department, building owners may opt-in to use **time-of-use emissions rates for compliance with BERDO 2.0**.
 - Time-of-use emissions data would need to be aggregated into a custom annual emissions factor.
 - Owners may opt-in or opt-out from using time-of-use emissions factors every “Verification Year” (i.e., starting in 2026 and every 5 years thereafter).
 - Owners will need to demonstrate that the time-of-use emissions data and methodology they used is accurate and provide third-party verification (this will require specific verification in addition to the typical third-party data verification under BERDO).
 - Owners would need to publish their time-of-use emissions data publicly and make data available for audit.

Renewable Energy Purchases

Topic #6

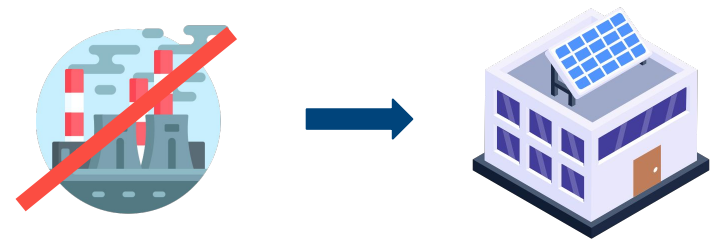
The Ordinance establishes that buildings may mitigate their CO₂e emissions from electricity by:

- **Purchasing Renewable Energy Certificates (RECs).**
 - Must be generated by non-CO₂e emitting renewable sources and meet the RPS Class I eligibility criteria.
 - 1 REC = 1 MWh = 1,000 kWh of renewable electricity.
- **Entering Power Purchase Agreements (PPAs) for energy generated by renewable non-emitting fuel sources.**
 - A PPA is a contract by which an Owner agrees to purchase electricity from a generating facility over a fixed term of years.
 - The Ordinance allows out-of-state PPAs and virtual PPAs for compliance.
- **Participating in Boston's Community Choice Electricity program.**

Renewable Energy Purchases

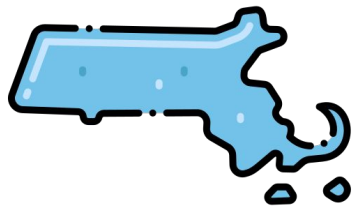
Topic #6

Regulations for renewable energy purchases should follow community priorities for BERDO 2.0:



Prioritize clean renewable energy generation that improves air quality and reduces greenhouse gas emissions.

Enable enrollment into the Boston CCE program, which reduces energy costs and promotes local renewable energy.



Promote new local renewable energy to provide job opportunities and improve energy resilience.

Renewable Energy Purchases

Topic #6

Preliminary proposals on PPAs:

- All PPAs used for BERDO 2.0 compliance must meet the requirements set by the Ordinance as well as any **additionality** requirements set by regulations.
- Additionality requirements may include:
 - The **commercial operation date** for the contracted project is set after the PPA contract execution.
- Energy purchased through PPAs that meet the criteria in the Ordinance and Regulations will be assigned an emissions factor of zero.

Questions:

- Are there other additionality criteria we should consider?

Renewable Energy Purchases



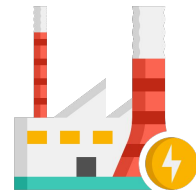
Topic #6

There are different types of arrangements to benefit from solar energy in Massachusetts:

Building installs solar PV and receives power (off-taker), but doesn't keep RECs



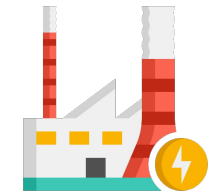
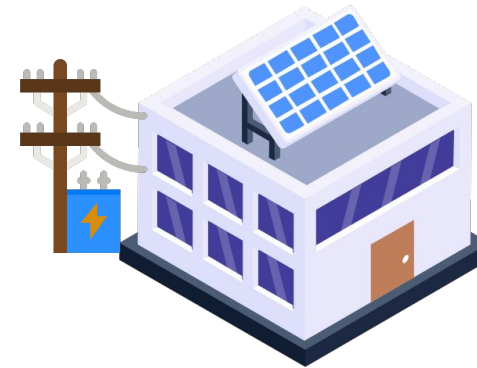
- Owns PV and receives net metering credits.



Utility

- RECs are retired by the utility through SMART program.
- SMART program provides incentive payments in return.

Community solar



Utility



- Many parties purchase power (**off-takers**)

Renewable Energy Purchases

Topic #6

Preliminary proposals on solar:

- *Up until a specified sunset date, energy off-takers from on-site solar systems or energy off-takers from PPAs for PV systems located in the City of Boston, may use the systems' annual energy generation for compliance with BERDO 2.0, regardless of whether the corresponding RECs are retired by or on behalf of the energy off-taker.*
 - *The building owner shall report the PV system's annual generation, as measured in kWh.*
 - *The PV systems' annual generation will be assigned an emissions factor of zero.*

Questions:

- *What would this mean for community solar projects? Are there other considerations for community solar?*
- *What is a reasonable sunset date?*

District Energy Systems

Topic #7



Goals for emissions factors from district energy systems:

- *Regulations set consistent, transparent methodology for district energy systems.*
- *Emissions factors can be customized to reflect the plant's actual operations and are responsive to decarbonization actions.*
- *Emissions factors reflect the entire system, including both electricity and thermal (steam, hot water) production.*
- *Emissions factors for district systems are updated annually and will be available within first few months of the year.*

Independent District Energy Systems

Topic #7

Possible approaches for emissions allocations (Part 1):

1. Efficiency method

- Allocates GHG emissions according to the **amount of fuel energy used to produce each final energy stream.**
- Assumes that conversion of fuel energy to steam energy is more efficient than converting fuel to electricity.
- Requires the use of assumed efficiency values.

2. Energy Content

- Allocates GHG emissions according to the **useful energy contained in each output stream.**
- Need information regarding the intended use of the heat energy.
- Best suited where heat can be characterized as useful energy, e.g., for process or district heating.

WRI recommends using the efficiency method as the preferred methodology.



Possible approaches for emissions allocations (Part 2):

Topic #7

3. Default Factors from EPA (as reported in Portfolio Manager)

Fuel Type	CO _{2eq} Emissions (kg/MBtu)	
	United States	Canada
District Steam	66.40	88.54
District Hot Water	66.40	88.54
District Chilled Water - Electric Driven Chiller	52.70	17.19
District Chilled Water - Absorption Chiller using Natural Gas	73.89	73.86
District Chilled Water - Engine-Driven Chiller Natural Gas	49.31	49.29

We have heard significant feedback so far that this is not a preferred approach for BERDO because it doesn't track real emissions or encourage plant decarbonization.

Possible approaches for emissions allocations (Part 3):

Topic #7

Allocating 100% of emissions to electricity production

- Total emissions of large CHP systems are counted by ISO-NE (grid operator) in grid emissions rate
- No emissions are applied to the thermal production (steam, hot water)

EPA Part 75 Reporting Requirements

- Part of the EPA's Acid Rain Program
- All generators >25 MW, including CHP, must continuously monitor and report nitrous oxides, sulfur dioxide, and carbon dioxide emissions
- Data reported in US EPA Clean Air Markets Database (CAMD).
- ISO-NE uses CAMD data as the primary data source for emissions calculations.

Campus District Systems

Topic #8

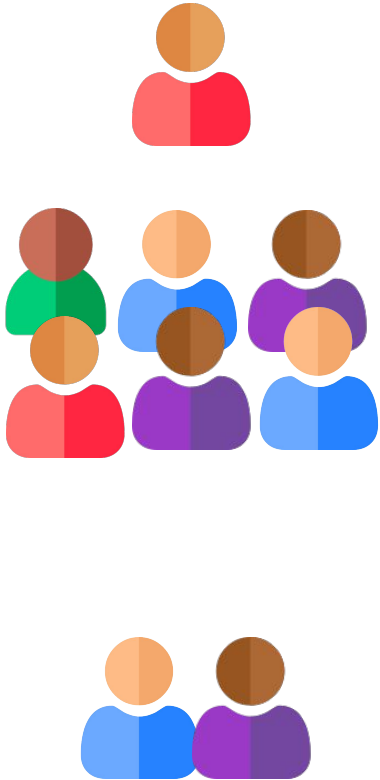
Preliminary proposals:

1. Campus district systems can choose to use the same methodology as the independent district systems, or;
2. Campus cogen plants can apply an emissions factors to their central plant's fuel inputs and apportion the emissions across their campus.
 - Buildings with metered or submetered energy must report the metered data at the building level.
 - If energy is not separately metered:
 - For buildings with the same building use, the total shared Energy use should be apportioned by the Gross Floor Area.
 - Buildings with different building uses, should be reported as a campus as defined in Portfolio Manager.

Review Board Requirements from Ordinance

Topic #9

- Nine members.
- Must be current residents of the City of Boston.
- Members will be appointed by the Mayor and approved by the City Council.
- Six members will be nominated by Community-Based Organizations.
- The Chair of the Boston City Council’s Environment, Resiliency and Parks Committee, or a designee hold one seat.
- Term: 3 years.
- Members for whom participation is not part of a full- or part-time job may request compensation for their service.



1 City Council seat

**6 seats
nominated by
CBOs**

**2 additional
seats**

Review Board Responsibilities

Responsibilities are detailed in the Ordinance



Decide on how to spend the Equitable Emissions Investment Fund



Approve flexibility measures (portfolios, hardship plans, individual compliance schedules)



Propose updates to Alternative Compliance Payments and Emissions Standards



REVIEW BOARD



Enforce ordinance and issue penalties



Recommend changes to compliance mechanisms and regulations

Review Board Regulations

Topic #9

Questions to address in regulations

- *How should nominating CBOs be selected? Who gets to be a nominating CBO?*
- *How should CBOs nominate members?*
- *What evidence makes sense to demonstrate the expertise of Review Board nominees?*
- *What rules should exist for members to be renominated and to fill in vacancies?*
- *How should members be compensated?*
- *What standards should exist for Review Board meetings?*

Goals for Nominating Process

Goals

- Review Board members are accountable to community and CBOs
- Nomination process enables a well functioning Board
- Nominating CBOs can be updated to respond to changes in organizations and community priorities
- Vacancies can be quickly filled with good candidates

Working with Community Leads

- *Community Leads are weighing in on Review Board straw proposals first.*
- *The City will bring proposals on the Review Board and other topics based on community feedback in upcoming hearings.*
- *Community Leads will be conducting additional resident engagement on Phase 2 regulations.*

Invited Community Leads:

- Action 4 Equity
- Allston Brighton Health Collaborative (ABHC)
- Alternatives For Community & Environment (ACE)
- Boston Climate Action Network (BCAN)
- Chinese Progressive Association (CPA)
- City Life/Vida Urbana
- Dudley Square Neighborhood Initiative
- Fairmount Indigo CDC Collaborative (represented by CSNDC)
- Mothers Out Front
- New England United 4 Justice (NEU4J)
- VietAID

Tentative Timeline

APCC meetings publicly noticed and accessible via boston.gov/public-notices.

Next steps:

- Continue meeting with stakeholders on regulations proposals.
- Review and respond to feedback on straw proposals.
- Draft regulations language.
- **Goal:** bring first draft regulations to October 19 meeting

Upcoming APCC Meetings:

- **October 19 at 1:00 p.m.**
 - City intends to submit draft regulations language. At the discretion of the Commission, first public comment period could open.
- **November 16 at 1:00 p.m.**
 - Discussion of feedback from public comment period.
- **December 14 at 1:00 p.m.**
 - To be determined by prior hearing.

Commission Q&A

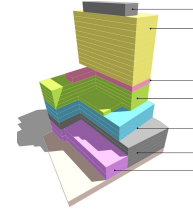
BERDO 2.0 Preliminary Phase II Regulations Proposals

Public Q&A will follow shortly. Members of the public may submit any comments or questions by “raising their hand” or typing in the chat box.

Phase 2 Regulations Topics



Review Board



Blended Emissions Standards



Emissions Factors

(Grid Emissions, District energy systems)

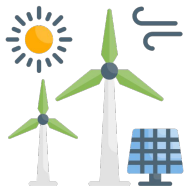


Designating tenant as owner

(Long-term commercial tenants)



Change of ownership



Renewable Energy Purchases

(PPAs, RECs, SMART Program)



Buildings in Special Circumstances

(Vacant buildings, demolitions)

Public Q&A

BERDO 2.0 Preliminary Phase II Regulations Proposals

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The background of the slide is a dark blue wireframe map of a city, showing building footprints, streets, and parks in a light blue color. The map is viewed from an elevated perspective.

Environmental Justice Metrics

Policy Context

Environmental justice metrics would monitor BERDO 2.0's impact on key community priorities:

- ***During the development of BERDO 2.0, the City of Boston conducted a resident-focused engagement process that identified a series of community priorities related to the program.***
 - *The City found that residents prioritize issues of indoor and outdoor air quality, reduction of energy bills, displacement, heating and cooling improvements, local job creation, and environmental benefits.*
- ***These community priorities are directly reflected in the Ordinance text:***
 - *“The [Air Pollution Control] Commission shall **disclose information relevant to air quality, Energy cost burdens, fair housing and housing displacement, jobs, and other qualitative and quantitative metrics related to Environmental Justice Populations and equitable implementation of this Subsection**” [...]*
 - *“Within one year, the Environment Department shall identify appropriate metrics and research mechanisms for (i) measuring and collecting this type of information and (ii) analyzing the impact, if any, of this Subsection on such metrics.”*

Today's presentation is meant to kick-off this process. We will lead a more robust engagement process on this topic with the Review Board, once it is seated.

Key Topics for Disclosure

Environmental justice metrics would monitor BERDO 2.0's impact on key community priorities:



Indoor and outdoor air quality



Thermal comfort



Energy cost burdens



Local jobs and workforce development



Displacement and fair housing



Environmental performance

Challenges to Monitor Environmental Justice Impacts

- **Data availability and collection**
 - No systematic data collection practices on several of the key topics.
 - Data dispersed across departments and third parties.
- **Data granularity**
 - Data usually not available at an address or building level.
 - Data confounding the impacts of BERDO with other socioeconomic and policy dynamics present in the city.
- **Privacy concerns**
 - Sensitive data related to health impacts or displacement may not be appropriate to collect.

Environmental Justice Metrics Research Findings

- Based on a literature review of existing environmental justice metrics and interviews within city departments and other third parties, we identified **over 40 metrics** that could be used to monitor the environmental justice impacts of BERDO 2.0
- These metrics would track the impacts and performance of BERDO 2.0 either **directly or by proxy**, and they correspond to data that is currently available or could be collected by the Environment Department from different sources.
- Several metrics would rely on **increasing reporting requirements** on building owners to collect additional information through the BERDO Reporting Form.
- The potential metrics have different levels of **reliability** and **internal validity** (i.e., the extent to which metrics are actually measuring the real-world state of the key topic they are intended to measure),

Proposed Approach

- Given the obstacles the City faces to collect, monitor, and disclose environmental justice related data, there are two types of metrics that the City could use for annual disclosure purposes

Type of metric	Description	Example
Impact and performance metrics	Indicators that can be directly traced at the building level and aggregated for disclosure. These also include general performance metrics for the Equitable Emissions Investment Fund.	<p>“Stove electrification in BERDO buildings”</p> <p>We could ask building owners to report whether all (or some) of their units have switched to electric stoves, and aggregate these numbers into a single metric for all BERDO buildings..</p>
Contextual metrics	Indicators that can be traced at the level of a census tract, zip code, or neighborhood*, and compared against the number (or density) of BERDO buildings in each area.	<p>“Asthma emergency department visits by zip code”</p> <p>We cannot track asthma emergency department visits coming from each BERDO building, but we have this data by zip code and can analyze whether zip codes with more or less BERDO buildings have greater rates of asthma.</p>

* For purposes of public disclosure, **the zip-code level** may be the most appropriate scale for contextual environmental justice metrics.



Example Metrics: Indoor and Outdoor Air Quality

Possible metrics for indoor and outdoor air quality - final metrics to track will be determined through process with Review Board

Metric	Metric type	Data source	Internal validity
A. Indoor and outdoor air quality			
A.1. Indoor air quality complaints in BERDO buildings	IMPACT	B	1
A.2. Adult asthma rates by zip code	CONTEXT	D	3
A.3. Asthma emergency department visits by zip code	CONTEXT	B	2
A.4. Asthma hospitalizations by zip code	CONTEXT	B	2
A.5. Efforts for indoor air quality monitoring in BERDO buildings	IMPACT	C	1
A.6. Stove electrification in BERDO buildings	IMPACT	C	3
A.7. Investments in populations impacted by air pollution	IMPACT	E	2
A.8. Investments in populations with high asthma rates	IMPACT	E	2

DATA SOURCES: A = Data collected by the Environment Department; B = Data collected by other City of Boston Departments and Agencies; C = Self-reporting data from building owners; D = Data collected from U.S. Census or other third-parties; E = Data collected after Equitable Emissions Investment Fund is established

INTERNAL VALIDITY: 1 = Metric is unlikely to reflect the actual status of the key topic that is intended to measure; 2 = Metric may reflect the actual status of the key topic that is intended to measure; 3 = Metric is highly likely to reflect the actual status of the key topic that is intended to measure.

Next Steps

- Research report will be posted on boston.gov/berdo
- We will report in aggregate on *optional* reporting questions asked on BERDO reporting form in 2022 disclosure.
 - *Topics: Air quality monitoring and whether tenant utilities are paid by the owner*
- Engage with Review Board (once established) to identify metrics for 2023 disclosure of 2022 data and long-term monitoring.

Commission Q&A

Environmental Justice Metrics

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Public Q&A

Environmental Justice Metrics

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Adjourn

Thank you! Please visit boston.gov/berdo for more BERDO information and updates.

