**ZEAB BERDO INITIATIVE SYNOPSIS**

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| --- | --- |
| GHG Emissions from Onsite Combustion of Natural Gas and Heating Oil | |
|  | Portion of All Brookline GHG Emissions |
| Non-Residential Buildings | 19% |
| One to Three Family Homes | 13% |
| Condominiums | 9% |
| Apartment Buildings | 4% |

Voluntary decarbonization/retrofit programs are not keeping Massachusetts on pace to meet its Net Zero goals. Several municipalities have addressed this by enacting Building Energy Reporting and Disclosure Ordinances (BERDO).

Four Massachusetts municipalities, Boston, Cambridge, Lexington, and Newton have BERDO laws in effect as of this writing. In some cases, building owners are only required to report energy consumption and greenhouse gas (GHG) emissions. In others, building owners must report GHG emissions and make an Alternative Compliance Payment of $234 per metric ton CO2e if they exceed allowable emissions standards.

Options are available to building owners to adjust their emissions limits and/or timelines for emissions reductions. These measures are subject to eligibility criteria, and most require approval from a BERDO Review Board.

Boston has established an Equitable Emissions Investment Fund. Boston’s BERDO Ordinance states the following: “Money in the Fund shall be expended for the support, implementation, and administration of local building carbon abatement projects that benefit the City of Boston’s emissions reduction goals. Fund expenditures shall prioritize projects that benefit Environmental Justice Populations and populations disproportionately affected by air pollution.”

In Cambridge: “Monies from Alternative Compliance Credits shall be used by the City solely for City programs and projects that directly reduce carbon emissions, including but not limited to, greenhouse gas reduction projects in Affordable Housing properties, if approved by the Cambridge Affordable Housing Trust.”

BERDO ordinances typically target commercial buildings that have floor areas 20,000 SF and above. Residential buildings are subject to BERDO if they have floor areas at least 20,000 SF or, in some cases, as few as 15 residential units.

The Massachusetts Large Building Energy Reporting (MA LBER) legislation applies to buildings 20,000 SF and larger, both commercial and residential. Owners of large buildings in Brookline and throughout the state must file MA LBER reports beginning June of this year. The state will publish the results annually, beginning this fall.

MA LBER reporting is a starting point for Brookline since it will provide a valuable database of energy usage and GHG emissions. The question is how far a Brookline BERDO ordinance should venture beyond MA LBER. Should it only include commercial buildings, or should residential buildings be covered as well?

Finally, any BERDO ordinance in Brookline that goes beyond MA LBER will have to be phased in over many years. This is consistent with the experience in Boston, Cambridge and Newton.

**OVERALL GOALS**

* Eliminate onsite combustion of fossil fuels from all buildings in Brookline by 2040 consistent with WA37 approved by Brookline Town Meeting in May 2021, which established a goal of net zero carbon emissions by 2040
* Propose, develop and enact a Building Energy Reporting and Disclosure Ordinance (BERDO)
* Provide mechanisms to address equity issues such as cost and disruption that disproportionately affect Environmental Justice Populations.
* Incentivize building owners to gain support for BERDO
* Incentivize building decarbonization

**ASSUMPTIONS**

* Building characteristics, including type, size, number and GHG emissions are approximations based on preliminary information from the Brookline Assessor’s FY2025 Property Database, the Brookline GIS Administrator’s Condominium Data, the Massachusetts LBER Covered Buildings List (March 31, 2025), and Blue Strike’s 2023 Brookline GHG Inventory.
* Allocation of GHG emissions among building types is based on weighted approximations of emissions per square foot.
* The cost to decarbonize buildings is based on *New York Building Electrification and Decarbonization Costs*, Rosen Consulting Group, June 2022.
* The cost to install heat pumps in single family homes from Massachusetts Clean Energy Center/Energy Sage Air Source Heat Pump Cost Estimator.

**EQUITY**

Northeast Energy Efficiency Partnerships published a position paper, *Centering Equity in the Rules and Regulations of A Building Performance Standard*, that’s relevant to BERDO. Highlights include the following:

“…A BPS creates a burden on owners to make capital expenditures to improve performance. For many, these burdens are exacerbated by a lack of capital resources, staffing, and historical discrimination, such as red lining, that still shape the building landscape today. The least efficient buildings will have the most to gain from complying with a BPS but will also cost the most to improve. It is not uncommon for older and neglected buildings to be owned by populations that will be challenged to make upgrades. Exempting this sector will only lead to bigger disparities between low-performing and average-performing buildings…

…A BPS may also cause compounding issues, such as increased property values of upgraded buildings. Compounding issues might include the displacement of tenants if efficiency investments are made and result in higher home values. Improvements that lower a building’s operating costs such as modern efficient HVAC systems and appliances, renewable energy, and weatherization improvements make a building more desirable and can increase the upfront cost to buy or rent the space, thus pushing out historically marginalized populations. For rental spaces, BPS policies create landlord tenant split incentives that can lead to displacement. When tenants pay for utilities, the financial savings of energy improvement projects go to tenants, while owners

pay upfront cost. Thus, property owners may be inclined to increase rent to recoup losses from paying for the efficiency upgrades…

…There are two main considerations when determining which buildings should comply with the BPS. The first relates to the square footage threshold. The smaller the size threshold, the more family-owned, small, and independent businesses will be included in the BPS. These facilities may struggle with resources and may be unfamiliar with tracking and reporting energy usage. Larger buildings often benefit by being managed or owned by professional companies that have the sophistication to deal with a program such as a BPS, especially as performance standards increase in popularity across the country. The second consideration in defining covered buildings is how the square footage threshold impacts the number and type of affordable housing buildings

within the covered buildings list. Affordable housing should be included to make sure the benefits of a BPS are distributed equally, and certain groups of people are not left out…

…There are some instances where complying with a BPS might be exceptionally or unreasonably burdensome for a building. Factors preventing compliance may include buildings that require major investments and improvements, building owners that do not have the necessary financial or staffing resources to make improvements, or buildings that have high energy or carbon emitting systems that still have a useful life and do not make economic sense to replace yet.”

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**BARRIERS**

The capital cost to retrofit existing buildings will be significantly more than that of meeting the incremental cost of compliance with fossil fuel free new construction.

Many (possibly a majority) building owners are likely to oppose BERDO

The administrative expense to expand BERDO to include one to three family homes and small condominiums will be significant.

Combined emissions from one to three family homes and small condominiums are nearly five times those from large condominium buildings. Condominium owners, especially owners of units in large condominium buildings, are likely to object if smaller homes are not included in BERDO.

Since condominium units are generally less expensive to own than single family homes, the owners of many condominiums will be less able financially to address the cost of BERDO compliance.

**INCENTIVES**

The basic framework for BERDO already exists.

Brookline is surrounded by municipalities that have already enacted BERDO ordinances.

Owners of buildings 20,000 SF and larger are already required to report energy usage as part of the MA LBER.

BERDO energy reporting is more detailed and informative than a GHG inventory.

Alternative Compliance Payments will be viewed as punitive. A BERDO ordinance should consider incentivizing building owners to decarbonize. Two possibilities are:

ACP offsets - If a building owner installs solar panels or EV charging stations or other decarbonizing devices, the cost (or some fraction) could be used to offset Alternative Compliance Payments from onsite fossil fuel combustion or

End of Useful Life Escrow Accounts - Building owners can elect to deposit Alternative Compliance Payments (0r some fraction) into escrow accounts. Funds would be kept in escrow until existing fossil fuel combustion equipment is replaced with fossil fuel free equipment, with the requirement that installation is no later than the year in which the existing fossil fuel combustion equipment reaches its Expected Useful Life.

Boston and Cambridge include GHG emissions from electricity consumption when determining Alternative Compliance Payments, with offsets for electricity from renewable sources. It can be argued that it is the state’s role to transition the grid to renewable sources and that it is unfair to impose Alternative Compliance Payments on building owners who have spent money to electrify their buildings. Newton excludes electricity entirely from compliance. Brookline should consider including reporting electricity consumption but should follow Newton’s lead in excluding electricity from compliance.

Newton has adopted a more gradual compliance path to zero emissions than Boston and Cambridge, with all targeting zero emissions in 2050. This provides building owners time and opportunity to make incremental decarbonization investments.

A support system needs to be provided for those building owners requiring assistance navigating issues including engineering/design/cost estimation for retrofit projects; contractors capable of executing retrofits; and HVAC servicing contractors capable of providing good service once systems are operational.

Consideration should be given to providing finance options that are break-even (or close to break-even) for building owners. This may require government subsidy or an enhanced Mass Save program,

**BASELINE DATA AND SCENARIOS**

|  |  |  |
| --- | --- | --- |
| GHG Emissions from Onsite Combustion of Natural Gas and Heating Oil | | |
| Building Type | Share of Total Brookline GHG Emissions | Share of Number of Buildings in Brookline |
| One to Three Family Homes | 13% | 73% |
| Non-Residential Buildings >20,000 SF | 12% | 2% |
| Condominiums <20,000 SF | 5% | 16% |
| Condominiums >20,000 SF | 4% | 2% |
| Apartment Buildings >20,000 SF | 3% | 1% |
| Apartment Buildings <20,000 SF | 1% | 3% |

**Buildings Proposed for Inclusion in Brookline BERDO**

*High Impact* - All buildings

*Medium Impact* - All buildings subject to MA LBER

*Low Impact* - All buildings subject to MA LBER except residential buildings

**Climate impact**

*High Impact* - Total elimination of GHG emissions from all buildings will result in a 43 % reduction in Brookline’s GHG emissions

*Medium Impact* - Total elimination of GHG emissions from all buildings subject to MA LBER will result in a 19% reduction in GHG emissions

*Low Impact* – Total elimination of GHG emissions from buildings subject to MA LBER, except residential buildings, will result in a 12% reduction in GHG emissions

**Cost to Implement (Town Government)**

The initial cost to implement BERDO will be $XXX,XXX. This might be offset or eliminated by adopting technology and methodology from other municipalities or the State.

Among the municipalities already having BERDO ordinances, Newton is most similar to Brookline. The number and total floor area of Newton buildings subject to MA LBER is comparable to Brookline’s. Newton has allocated $290,000 per year to support BERDO, including one FTE. Brookline might be able to offset some cost by aggregating staffing efforts with other municipalities or the State.

Costs to implement will be more than proportionately higher if one to three family homes are included due to the large number of buildings and less ability of individual homeowners to navigate the reporting system.

**Revenue From Large Building Alternative Compliance Payments**

The following examples are based on residential and commercial emissions from onsite fossil fuel combustion reported by Blue Strike’s 2023 Brookline GHG Inventory. The emissions standards are based on the Newton BERDO ordinance. It should be noted that while Boston is enforcing BERDO compliance for both residential and non-residential properties, Newton and Cambridge do not require compliance for residential properties.

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**Cost to Brookline Building Owners - $/Metric Ton GHG**

|  |  |  |
| --- | --- | --- |
| Cost to Decarbonize Existing 20,000+ SF Commercial Buildings (Subject to MA LBER) | | |
|  | 16,100,000 SF | 39,500 MT CO2e |
|  | Air Source Heat Pumps | |
|  | Low Cost | High Cost |
|  | $193,000,000 | $337,000,000 |
| $/MT CO2e | $5,000 | $8,500 |

|  |  |  |
| --- | --- | --- |
| Cost to Decarbonize Existing 20,000+ SF Apartment Buildings (Subject to MA LBER) | | |
|  | 4,375 Units | 8,500 MT CO2e |
|  | Air Source Heat Pumps | |
|  | Low Cost | High Cost |
|  | $85,000,000 | $188,000,000 |
| $/MT CO2e | $10,000 | $22,000 |

|  |  |  |
| --- | --- | --- |
| Cost to Decarbonize Existing 20,000+ SF Condominiums (Subject to MA LBER) | | |
|  | 6,150 Units | 12,100 MT CO2e |
|  | Air Source Heat Pumps | |
|  | Low Cost | High Cost |
|  | $119,000,000 | $264,000,000 |
| $/MT CO2e | $10,000 | $22,000 |

|  |  |  |
| --- | --- | --- |
| Cost to Decarbonize Existing 1,000 to 5,000 SF One Family Homes (88% of Brookline One Family Homes) | | |
|  | 4,000 Homes | 24,200 MT CO2e |
|  | Air Source Heat Pumps | |
|  | Low Cost | High Cost |
|  | $121,000,000 | $145,000,000 |
| $/MT CO2e | $5,000 | $6,000 |

**STRATEGIES TO CONSIDER FROM OTHER MUNICIPALITIES**

Contact municipal staff and community organizers from Boston, Cambridge, Lexington, and Newton to discuss their experience with enacted BERDO ordinances

Contact municipal staff and community organizers from Watertown to discuss their experience developing BERDO implementation