



BUILDING ENERGY REPORTING & DISCLOSURE IN CHELSEA

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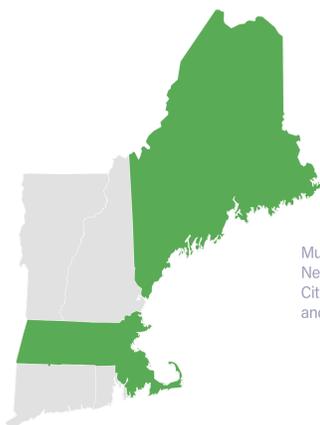
INTRODUCTION

The Commonwealth of Massachusetts approved the **Climate Roadmap Law** in 2021, requiring emissions to be reduced by 50% through 2030, and achieving net-zero by 2050. This means cities and towns like Chelsea will have to generate the same amount of greenhouse gas (GHG) emissions as these are removed from atmosphere. To achieve these goals, Chelsea has to understand energy consumption in buildings throughout the city.

The City of Chelsea is considering an energy benchmarking policy that would require large building owners to report on their energy use in an annual basis. The benchmarking policy, known as **BERDO**, would generally apply to residential and non-residential buildings with 20,000 square feet of gross floor area (GFA) or more. Residential buildings that do not meet the GFA threshold, but do have 20 units or more, would also be required to report energy use.

ENERGY BENCHMARKING

Background research was made to know which municipalities keep track of energy use in buildings and how these work. Cities throughout the United States were included in the research, but New England policies were evaluated more thoroughly due to similar population and urban characteristics.



Municipalities with benchmarking policies in New England included the City of Boston (MA), City of Cambridge (MA), City of Portland (ME), and City of South Portland (ME).

KEY QUESTIONS

In order to present the draft energy benchmarking policy to the Chelsea City Council, city staff had to answer 2 primary questions:

1. Which buildings would have to report under the 20,000 GFA and 20 residential unit thresholds?
2. What percentage of GFA would the City of Chelsea be able to capture under the 20,000 GFA and 20 residential unit thresholds?

METHOD

GATHERING NECESSARY INFORMATION

In order to know which buildings would need to report under BERDO, geospatial data was gathered from the Massachusetts Bureau of Geographic Information (**MassGIS**) website. The North Suffolk Office of Resilience & Sustainability (**NSORS**) avoided grouping numerous datasets for the exercise, centering exclusively on the **L3 Standardized Assessors' Parcel** and the **Building Structures (2-D)** datasets administered by MassGIS.

KEY TABLES FROM MASSGIS DATASET

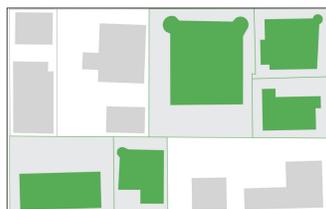
- M057TaxPar Table from L3 Standardized Assessors' Parcel identifying parcels for the municipality. Relevant fields include (1) **map-lot number**; (2) **location ID**.
- M057Assess Table from L3 Standardized Assessors' Parcel identifying uses and attributes within a parcel identified in M057TaxPar. Relevant fields include (1) **use code**; (2) **gross floor area**; (3) **map-lot number**; (4) **location ID**.

STANDARDIZING GFA CALCULATIONS

The structure of the MassGIS datasets includes information on parcels that have multiple buildings within them. In order to have a finalized amount of GFA to select which buildings would have to report, NSORS staff summarized the M057Assess table by **location ID**.

The importance of using the location ID for summarizing GFA relates to the ability to join the finalized **M057Assess** grouped table to the **M057TaxPar** table. Transferring the GFA sum to the parcel geospatial dataset is necessary in order to visualize on a map which parcels would have to report.

SINGLE-BUILDING PARCELS



Single-building parcels are straightforward to calculate the total GFA in order to know if a building has to report energy use.

MULTI-BUILDING PARCELS



Multi-building parcels are more complicated to calculate total GFA, summarizing information at the parcel level was the most practical method.

CALCULATION METHODOLOGY & WORKFLOW

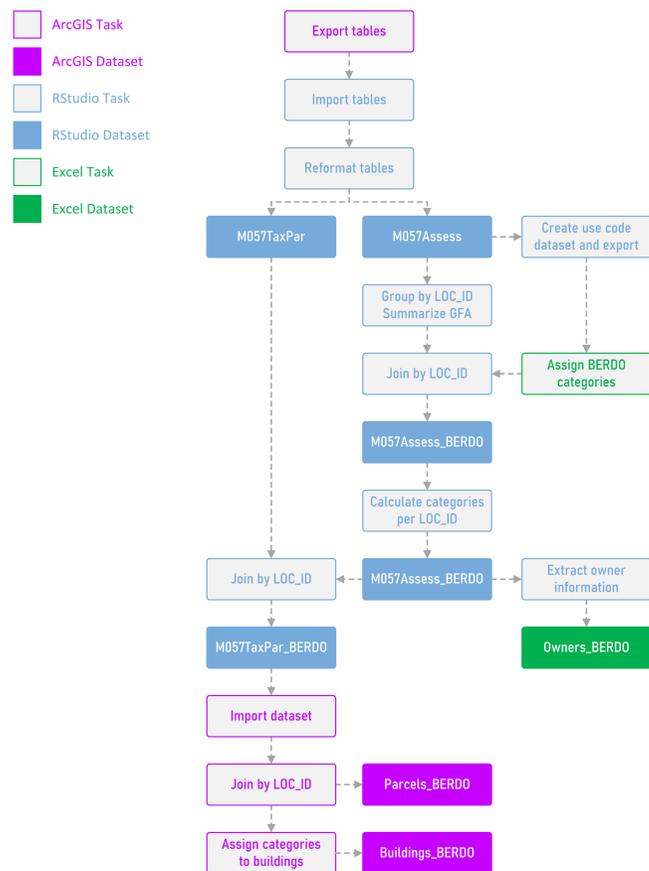
The NSORS staff developed a methodology that can be replicable for future use. Since the BERDO program is expected to be active in subsequent years, a clear way to recalculate GFA is needed to know which new buildings are required to report annual energy use.

In addition to identifying calculations for GFA at the parcel level to then assign relevant categories to buildings, the NSORS staff had to establish which uses were considered residential, non-residential, and municipal. To assign these categories, the **use code** information found in the **M057Assess** dataset was used.

Once the GFA sum and use category were determined for each case in the **M057Assess** dataset, a summary of GFA by category was done to assign a final category to the relevant parcel. The calculation for this task was a simple formula where if a parcel has more than 1 **use code**, whichever has a majority of the total parcel GFA (> 50%) will be considered the **general category** for that parcel.

Once the calculations were completed, the team created a list of building owners that would have to report annual energy use. The new **M057TaxPar** dataset with summarized GFA and use category was used in ArcGIS Pro to create a map of parcels. The buildings were then selected by each parcel to identify which ones met the 20,000 GFA threshold.

The finalized dataset was then used to calculate the percentage of GFA the City would be able to capture under the BERDO program.

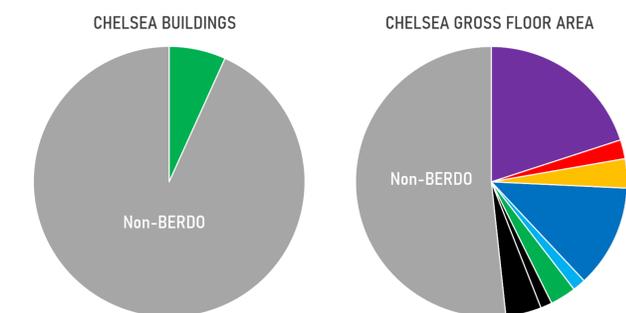


RESULTS

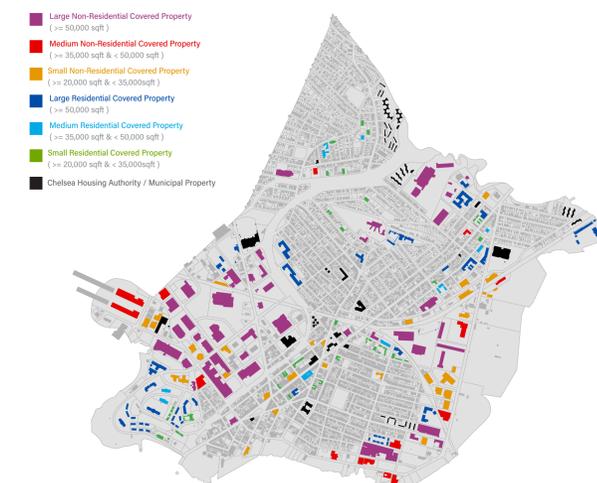
TOTAL GFA CAPTURED UNDER BERDO

Once the calculations were completed to enable the identification of buildings required to report through GIS, the parcels were classified according to other municipalities' ordinances for **covered properties** (buildings required to report). The dataset was then summarized and grouped by covered property type, identifying the number of buildings under each category, as well as GFA subject to reporting under the proposed BERDO program.

Municipality	Eligible GFA	Covered Type	Buildings	%	GFA	%
Chelsea	23,749,318	L-NR	57	1.32%	4,745,807	19.98%
		M-NR	17	0.39%	538,503	2.27%
		S-NR	33	0.76%	829,523	3.49%
		L-R	62	1.43%	2,919,958	12.29%
		M-R	12	0.28%	369,330	1.56%
		S-R	45	1.04%	733,889	3.09%
		HA	42	0.97%	324,414	1.37%
		MUN	24	0.55%	1,006,773	4.24%
		NC	4038	93.26%	12,281,121	51.71%



BUILDINGS REQUIRED TO REPORT UNDER BERDO



ACKNOWLEDGMENT

The research and resulting information is made possible thanks in part to support from the Barr Foundation.