

Energy Efficiency & Commercial Real Estate

Barriers and Opportunities
in the Boston Market



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EXECUTIVE SUMMARY

A Better City (ABC) is a membership based non-profit focusing on the environment, land development, and transportation in the Metro Boston area. ABC works with leading commercial real estate market participants, including building owners, property managers and major tenants, through the Commercial Real Estate Working Group of the Boston Green Ribbon Commission. The goal of the Commission is to assist the City in meeting the goals of its 2010 Climate Action Plan. This report, which was funded through the support of the Barr Foundation, is an effort to characterize the Boston commercial real estate market and to identify key barriers to wider energy efficiency technology adoption. The information found in this report was developed through focus groups, interviews and surveys of Boston building owners and property managers.

The report is divided into three sections. The first section reviews key metrics about the Boston commercial office and hotel building stock. Critical metrics such as building age and size distribution are discussed in detail. A review of nationally prominent environmental certifications such as LEED and Energy Star is also presented in this section. The second section discusses the results of stakeholder focus groups, interviews and surveys on the key barriers to energy efficiency investment for both commercial office owners and hoteliers.

The final section provides recommendations for potential programs and policies the City could pursue in order to address the issues identified during the stakeholder interview process. Among these are:

- Implement a comprehensive education program to train building owners to use the U.S. EPA's Energy Star Portfolio Manager program in advance of the implementation of the proposed building energy reporting and disclosure ordinance;
- Explore developing a program to encourage the adoption of next-generation energy efficiency finance tools such as managed energy service agreements (MESAs);
- Develop a program to help overcome the split incentive issue by encouraging the use of energy aligned leases in commercial office properties;
- Implement a behavior-based commercial energy conservation initiative to capture savings opportunities that are currently overlooked by the existing utility energy efficiency programs.

Implementation of the recommendations outlined in this document could significantly increase the demand for energy efficiency retrofits in the Boston commercial real estate market, both improving the competitiveness of Boston's building stock and helping to reach the City's aggressive greenhouse gas reduction goals.

INTRODUCTION

The City of Boston is an international leader in sustainability policy and, over the past decade, has implemented a number of nationally significant sustainability initiatives. Boston was the first major American city to require that new buildings meet LEED building standards. In October 2010, the City established one of the most advanced building energy codes in the country by adopting the Massachusetts Stretch Energy Code. These and other energy-related policies form the foundation of Boston's Climate Action Plan, a comprehensive strategy to reduce community-wide greenhouse gas emissions 25 percent by 2020. Adopted in 2009, the Boston Climate Action Plan provides a well-defined roadmap for accomplishing this aggressive greenhouse gas reduction goal. The plan recommends sixteen specific policies and programs that, when fully implemented, will result in the City reducing community greenhouse gas emissions by more than 2.16 million tons annually.¹

As part of its Climate Action Plan implementation process, the City has actively engaged the Boston Green Ribbon Commission on key aspects of the Climate Action Plan. The Commission, which includes sector working groups representing the City's largest private-sector and not-for-profit employers, has worked to ensure that the wider Boston community is both informed of and involved in the Menino Administration's climate planning efforts. The Commission's Commercial Real Estate Working Group (CREWG) includes several of the largest commercial office owners in Boston as well as leaders from major hotels, property management firms and real estate brokerages. The CREWG works to ensure that City staff have access to opinions and insights from Boston commercial real estate sector and provides a forum through which real estate community stakeholders and the City can discuss implementation issues related to the Climate Action Plan. As part of the ongoing work of the Green Ribbon Commission, the CREWG has worked to develop a better understanding of the Boston commercial property landscape, the challenges building owners face in improving the energy performance of their buildings and the potential policies the City could explore to better serve this market.

In 2011, more than 47 percent of Boston's greenhouse gas emissions were attributed to energy use in commercial and industrial buildings. Additionally, the majority of the non-residential built environment in Boston is commercial office space. Given this, meeting the goals of the Climate Action Plan will require a focused and successful effort to reduce energy consumption in commercial properties. The barriers to efficiency investment in the CRE sector are well documented, and a literature review of nation-leading energy efficiency programs shows few effective efforts to comprehensively engage the commercial office market. The City has an opportunity to develop and implement targeted CRE efficiency initiatives that both further the goals of the Climate Action Plan and establish a nation-leading standard for program effectiveness. Developing the next generation of efficiency initiatives will require a nuanced understanding of this complex marketplace and the implementation of broad-based efficiency programs in Boston requires a comprehensive understanding of all sub-sectors of the commercial property market.

¹ This is equivalent to taking 408,000 passenger vehicles off the road.

This research paper is an effort to help inform policy makers, efficiency program administrators and the wider CRE community about the challenges and opportunities of energy efficiency in the Boston commercial property market. Section I of this report reviews statistics on three major commercial property sub-markets: Class A properties, Non-Class A properties, and hotels. Section II discusses the results of a series of stakeholder surveys and interviews with Boston property owners, building managers and major tenants. Section III reviews the implications of this research on future City energy programs and suggests a potential roadmap for addressing key barriers to greater energy efficiency program delivery in the commercial property market.

BOSTON’S COMMERCIAL BUILDING MARKET

The Boston commercial property market is comprised of a diverse mix of property types, from large multi-million square foot office towers owned by global real estate investment firms, to small one- and two-story properties owned by local family trusts. The Building Owners and Managers Association (BOMA), an international organization representing the commercial real estate community, divides office properties into three classes based on a number of quantitative and qualitative characteristics. Class A properties are typically the premier properties in a local market, while Class B and C properties provide functional office space with fewer amenities at discounted rental rates. Box 1 below provides definitions for each of these building classifications as defined by BOMA. The Boston market includes a full range of property types and understanding the unique characteristics and challenges of these property types is critical to fully engaging the market on energy efficiency issues.

Non-Class A commercial properties have fundamentally different characteristics from Class A properties, with different ownership profiles, tenant types, and operations strategies. Class A properties are more likely to be owned by large national or international real estate investment trusts and typically have substantial resources to devote to property upkeep and investment, while Class B and Class C properties may tend to be owned by smaller investment entities with fewer resources to devote to energy management and efficiency upgrades. Similarly, the institutional investors that tend to own Class-A properties are more likely to have comprehensive sustainability goals that encourage investments in energy efficiency. Finally, interviews with property owners indicate that tenants in Class A properties are typically more willing to pay a rental premium for office space that has

Box 1: BOMA Market Classification Definitions (BOMA, 2011)

Class A: Most prestigious buildings competing for premier office users with rents above average for the area. Buildings have high quality standard finishes, state of the art systems, exceptional accessibility and a definite market presence.

Class B: Buildings competing for a wide range of users with rents in the average range for the area. Building finishes are fair to good for the area. Building finishes are fair to good for the area and systems are adequate, but the building does not compete with Class A at the same price.

Class C: Buildings competing for tenants requiring functional space at rents below the average for the area.¹

received LEED or Energy Star certification. Given these critical differences in property types, tailored and flexible energy efficiency engagement strategies that account for the unique characteristics of these building types is warranted.

The nature of the energy efficiency opportunities is also different between Class A and Non-Class A properties. Many of the largest Class A building owners in Boston are actively engaged in improving the energy performance of their properties and a recent analysis by Boston Properties for the Green Ribbon Commission found that nearly fifty percent of the City's large, Class A building space qualified for either LEED or Energy Star certification. Additionally, a number of Class A facility managers report that they have already taken advantage of utility-sponsored retrofit opportunities and have struggled to find other rebateable efficiency projects in their buildings. While much of the City's Class A commercial office space qualifies for Energy Star or LEED designations, Boston's Non-Class A building stock has few certified buildings. Similarly, interviews with Class B and C building owners and property managers indicate that, in many properties, some of the most cost effective energy retrofits have yet to be implemented. Substantial savings opportunities are likely available within both the Class A and Non-Class A sub-market; however, the nature of these opportunities is likely fundamentally different given the substantial previous work already completed by Class A building owners.

While comprising only a small portion of Boston's total building stock, hotels may represent a significant energy savings opportunity for utility energy efficiency program administrators and the City of Boston. The EPA reports that nationally, hotels have some the highest average energy intensities of major property types (U.S. EPA, 2012). As a major center for both tourism and a conventions destination, Boston's hotel industry is an important part of the regional economy. Improving the energy performance of Boston's hotels will not only benefit property owners, but will also help the City in cultivating its global green reputation and in meeting local greenhouse gas reduction goals.

REVIEW OF BOSTON'S COMMERCIAL BUILDING STOCK

Understanding the challenges and opportunities in Boston's hotels and commercial office properties requires a thorough analysis of the market size, ownership characteristics, existing environmental certifications and other critical market metrics. The following sections characterize Boston's commercial office buildings and hotels using information from several publicly available datasets including the Boston Assessor's Database, the EPA Energy Star Database, CoStar, USGBC's LEED buildings database and the Boston Redevelopment Authority's GIS database.

COMMERCIAL OFFICE PROPERTIES

The following sections review key metrics about the Boston commercial office property market. These sections break down the total market by size and class, review the geographic distribution of certain property types and discuss the status of environmental certifications of existing Boston commercial office properties.

COMMERCIAL OFFICE MARKET SIZE BY BUILDING CLASS

The Boston commercial office sector is diverse, with a significant number of properties in all classifications making up the market. Figure 1 below shows the relative size by total rentable square footage of the Boston commercial office market by property classification. As the figure indicates, 52 percent of the market (54.6 million sq ft) is Class A property while 34 percent (36.3 million sq ft) and 14 percent (14.7 million sq ft) of the market are designated Class B and C respectively. Figure 2 shows the number of properties in each classification. As the figure shows, there are significantly more Class B and Class C properties in Boston (1,350 total) than Class A buildings (150) indicating a more fragmented Class B/C market with a diversity of smaller properties.

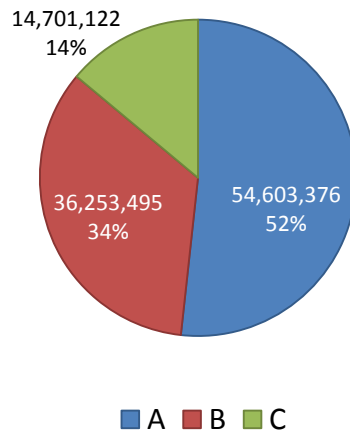


Figure 1. Class A,B and C market by sq ft.

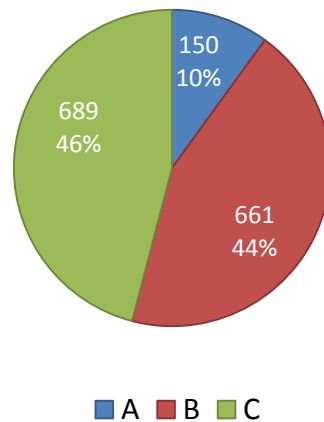


Figure 2. Class A, B and C market by number of properties

Figure 3 and 4 below show the distribution of buildings by property sizes and class across a range of building size classifications. As the figures indicate, the majority of Class B and C properties are under 50,000 square feet while a significant portion of the total city-wide Class B and C square footage is distributed across the building size spectrum. There are relatively few smaller Class A properties, with

the majority of properties in the 100,000 square foot and greater classifications. The overwhelming majority of the total Class A office space is in larger properties with much of this stock in the two largest building size classifications, as seen in figure 4.

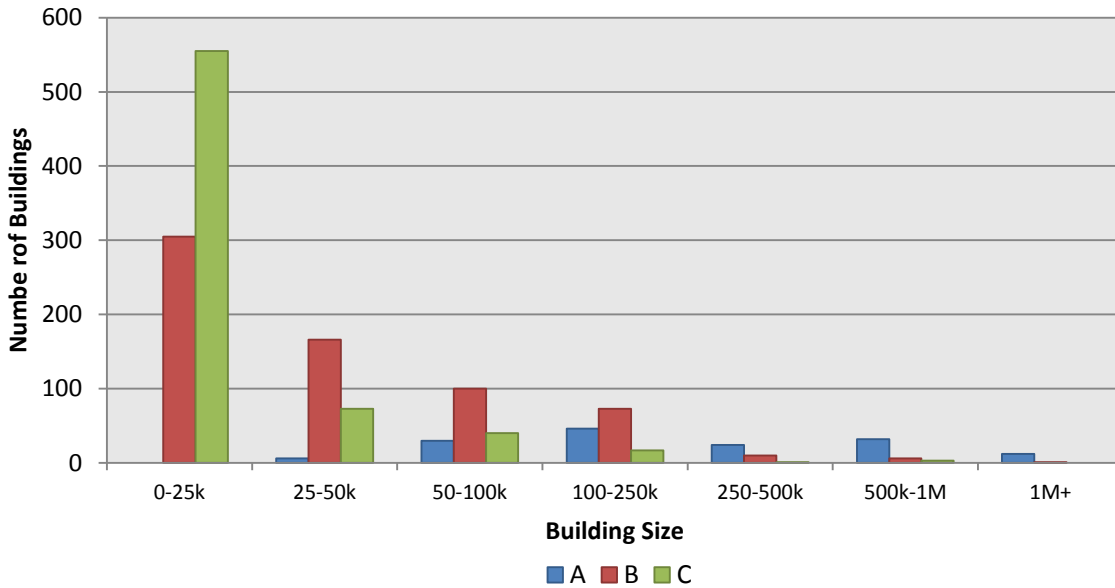


Figure 3. Number of buildings by class and size

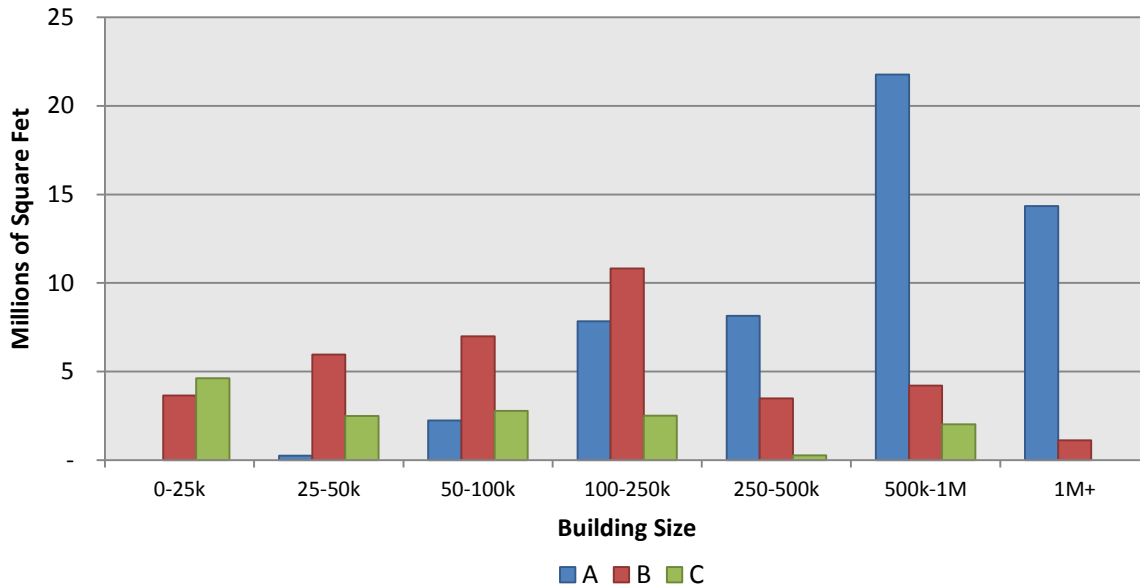


Fig. 4. Millions of sq. ft. by class and building size

The City of Boston intends to implement a building energy reporting and disclosure ordinance that will affect property owners in all commercial office property classifications. If Boston chooses to adopt a building size reporting threshold below 50,000 square feet, a significant proportion of the City's non-Class A properties could be affected by this regulation. If the City requires building 25,000 square feet

and above to disclose their energy consumption, around 490 B/C buildings would need to comply with the regulation, representing more than 35 percent of all Class B and C properties. A higher building size reporting threshold during the early years of any new regulation will likely result in higher compliance rates and more accurate benchmarking results as the regulation would be limited to a smaller cohort of building owners who are more likely to already track the energy performance of their properties.

COMMERCIAL BUILDING STOCK AGE

Boston’s Class A commercial real estate was largely built during the past five decades, with a recent construction boom in the last fifteen years. Figure 5 below shows the growth of the Class A property market since 1870. As the figure shows, a limited portion of the existing building stock was built between the turn of the last century and the beginning of the 1930s. This period was followed by several decades of limited new construction. A major Class A building boom occurred starting in the late 1970s and continued through much of the 1980s.

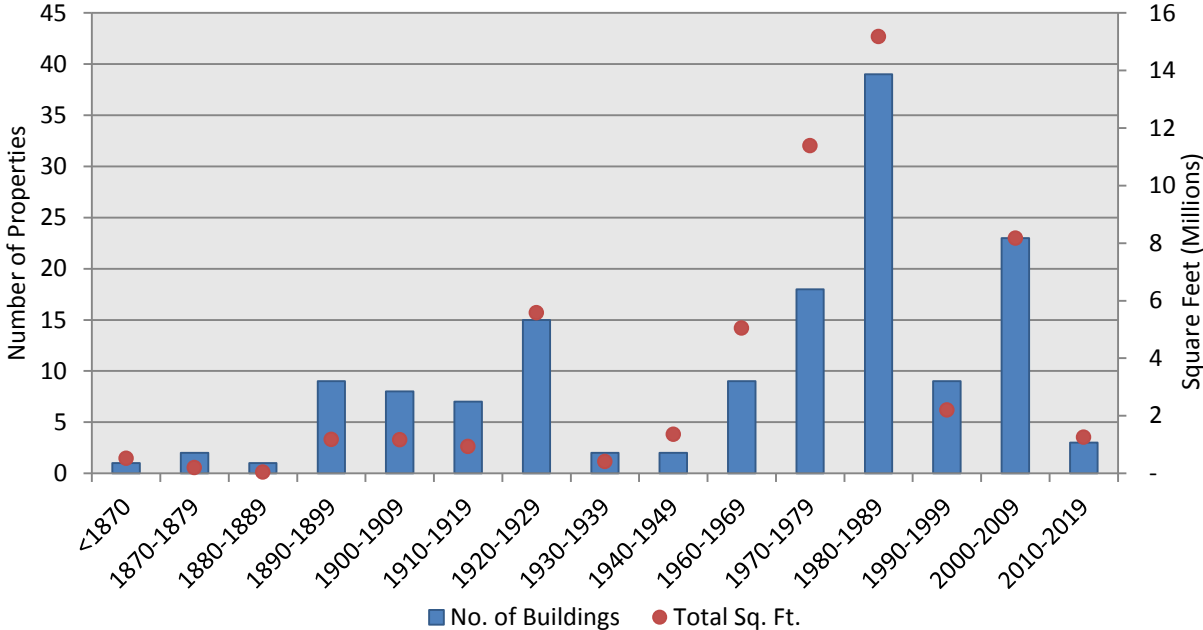


Figure 5. Number of Class A properties and total square footage by decade built.

Boston’s Non-Class A building stock ranges in age from buildings that were constructed before the Civil War to buildings that were completed in the first decade of the 21st century. Figure 6 below shows the number of building and total square footage of office space in Boston’s Non-Class A building stock by building age. As the chart shows, a significant number of Boston buildings were built before the Second World War. After this building boom, a two-decade construction slowdown occurred during the 1940s and 1950s. This was broken by a rapid increase in construction that lasted for the next three decades. As the chart indicates, buildings constructed during this second construction boom tended to be much larger than buildings constructed around the turn of the 20th century.

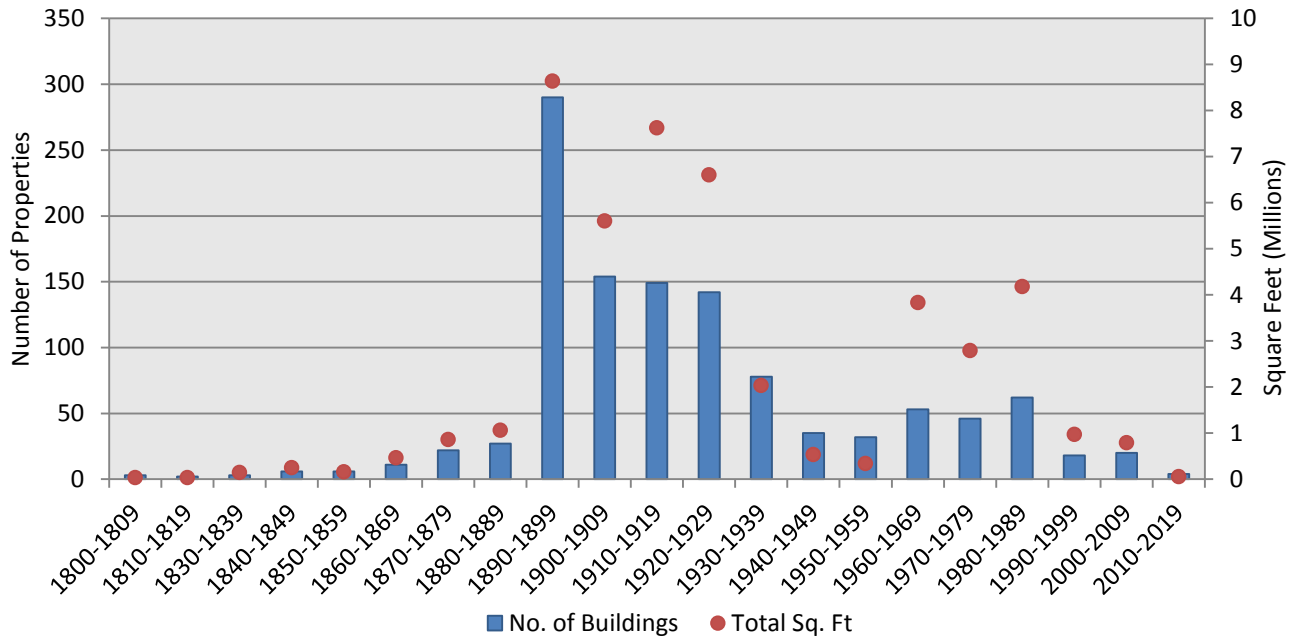


Figure 6. Total square footage and number of Class B/C office properties by decade built

The advanced age of much of Boston’s Non-Class A building stock presents both challenges and opportunities for energy conservation. A recent analysis of energy consumption data reported to New York City as part of their energy reporting and disclosure ordinance found that properties built in the 1920s and 1930s tended to consume less energy per square foot than newer properties. A number of hypotheses have been proposed to account for this phenomenon including the theory that older properties were designed before the advent of central air conditioning, necessitating more efficient building envelopes and a reliance on passive cooling strategies. Building performance experts have also noted that buildings constructed during the late 1970s and early 1980s were required to limit outside air ventilation, leading to higher HVAC demands during shoulder seasons.

STATUS OF ENVIRONMENTAL CERTIFICATIONS IN BOSTON’S COMMERCIAL BUILDINGS STOCK

Over the past decade, EPA’s Energy Star designation for buildings and the U.S. Green Building Council’s LEED certification system have become industry standard labels for recognizing high performing commercial properties. Many building owners are increasingly trying to differentiate themselves in the market by seeking these environmental certifications. To date, a significant proportion of Boston’s Class A property owners have received one or both of these designation for their buildings, while very few Non-Class A properties have these recognitions. Table 1 below shows the breakdown of Energy Star and LEED certifications by property sub-type in the Boston market.

Table 1. LEED and Energy Star certified buildings in Boston

	LEED & Energy Star		LEED Only		Energy Star Only	
	No. of Buildings	Sq. Ft.	No. of Buildings	Sq. Ft.	No. of Buildings	Sq. Ft.
Class A	19	15,881,065	11	6,491,029	26	12,381,070
Non-Class A	4	1,017,501	4	189,168	11	3,023,687

As the table shows, only 19 Non-Class A office properties in Boston have received a LEED designation or an Energy Star certification, and eight of these properties are currently owned by either a non-profit institution or a government agency. With more than 1,350 Non-Class A office properties in Boston, there are several reasons for this low level of participation in these widely accepted environmental designations. They include low interest, a lack of information and understanding of the programs, and cost associated with the certification process. The low number of buildings receiving Energy Star certification also suggests that significant potential savings could be gained through a focused program targeting this market segment, as limited previous efficiency work has been completed in these properties.

HOTELS

According to the Massachusetts Lodging Association, there are more than 74 hotels in Boston with a total of more than 18,500 hotel rooms. Many Boston hotels have actively pursued green initiatives, earning national and international designations for their sustainability practices. The following sections review key facts about Boston’s hotel building stock and the prevalence of green certifications in this market.

REVIEW OF BOSTON’S HOTEL BUILDING STOCK

The 74 hotels that make up the Boston market range in size from as few as seven rooms at the smallest property to more than 1,200. While this large range is indicative of a diverse market, the majority of Boston hotels have fewer than 160 rooms. Figure 7 below shows the distribution of hotel sizes by rooms in the City. The figure shows both the number of properties within each size bin as well as the total number of city-wide rooms in each size classification. As the figure shows, there are a significant number of smaller properties in the City, however the total number of rooms in Boston are relatively evenly distributed across the full range of property sizes.

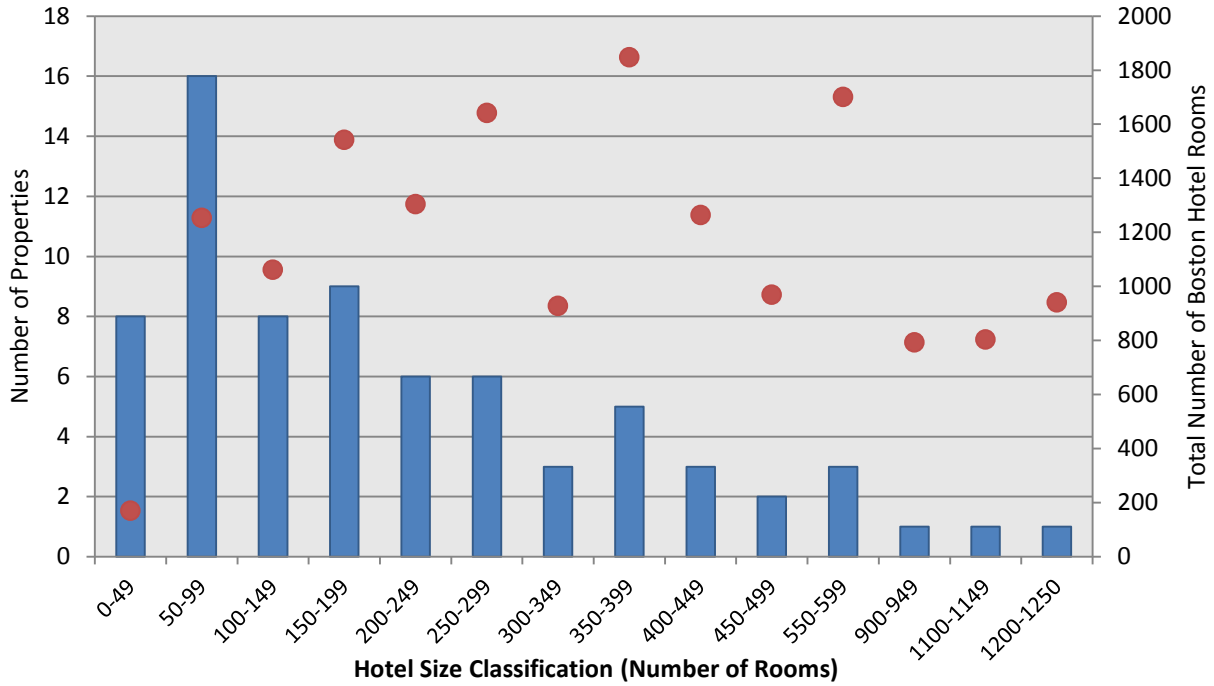


Figure 7. Boston hotel size distribution by number of rooms

AGE OF BOSTON'S HOTEL BUILDING STOCK

Boston's current hotels stock was built between the early 1890s to the early years of the current century. Hotel properties have been added to the Boston hotel building stock during each of the last ten decades, with notable building booms during the 1890s and 1920s. As Figure 8 shows below, several large hotels were built during the 1980s, comprising the largest building boom by total hotel square footage over the past 100 years.

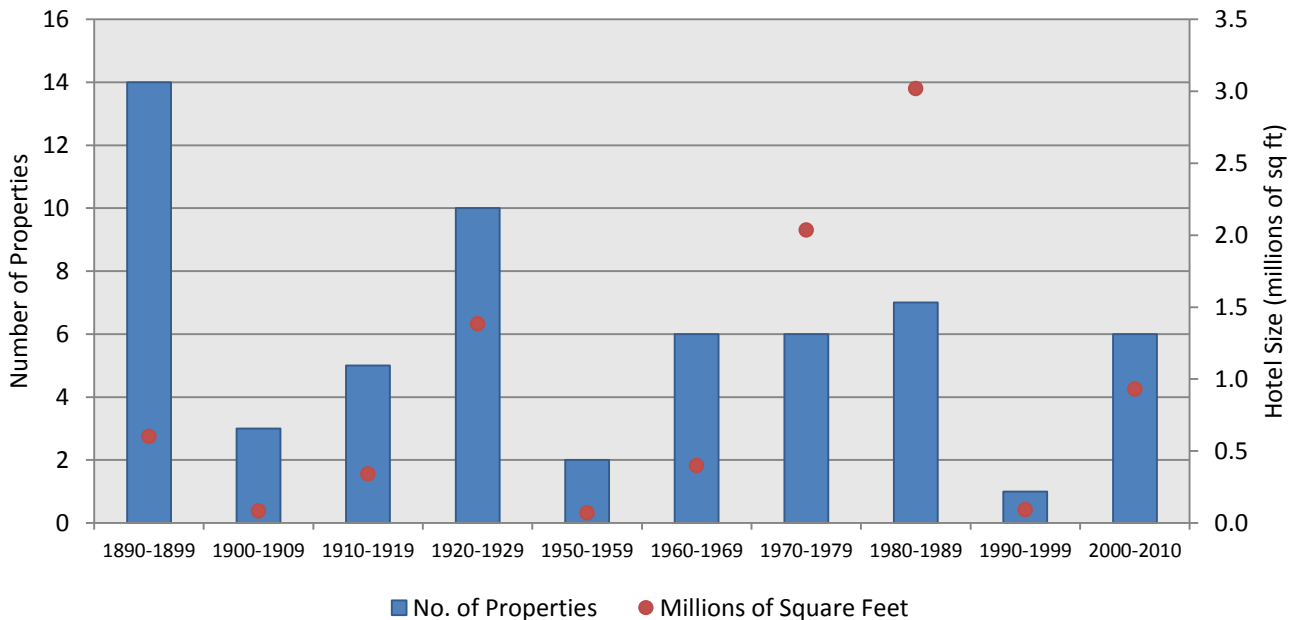


Figure 8. Boston's hotel building stock by year built

STATUS OF ENVIRONMENTAL CERTIFICATIONS

There are a number of widely accepted sustainability ratings for hotel properties. These include the EPA Energy Star and USGBC LEED ratings as well as the Green Key, Green Seal and EcoRooms rating scales. Many Boston hotels have aggressively pursued green certification with nearly one third of City hotels receiving at least one green certification. Since 2007, nine Boston hotels totaling more than 3.9 million square feet have received an Energy Star designation. This represents more than 40 percent of the City's total hotel stock by square footage. Similarly, 14 Boston hotel properties have received a Green Key rating since 2008, representing nearly 20 percent of all Boston hotels. LEED certification is available for Hotels, however this designation is less popular with hoteliers than it is with other property owners with only one Boston hotel receiving a LEED designation in the past several years.

SURVEY AND INTERVIEW RESULTS

An online survey and a series of focus groups and phone interviews were conducted in order to better understand how property owners and managers in Boston view energy issues. One survey was distributed to commercial office owners and managers while a separate survey was distributed to hotel owners. A total of 14 respondents completed the commercial office survey and 16 hotels took part in the hotel assessment. In addition to the survey, brief interviews were conducted with property owners and managers to better understand their perspective on energy issues. The following section reviews key findings of this process

MAJOR BARRIERS TO ENERGY EFFICIENCY

Respondents cited a diverse array of barriers to energy efficiency investment. These included access to capital, lack of energy project expertise, challenges navigating and understanding utility incentive programs, split-incentive issues and building investment strategy priorities.

COMMERCIAL OFFICE PROPERTY ENERGY EFFICIENCY BARRIERS

The following section reviews the major barriers identified by commercial office property owners and managers during the survey and interview process.

SPLIT INCENTIVES

Survey responses and discussions with key property owners repeatedly pointed to familiar tenant-landlord issues as a critical barrier to energy efficiency investment. For many commercial office properties, tenants have primary control over building energy use, giving landlords limited incentive to address energy issues. Additionally, given existing lease structures, property owners are frequently unable to recoup costs associated with energy efficiency investments from their tenants. Non-Class A property owners and managers reported that, while a limited number of their tenants have shown an interest in properties that have received green certifications, those same tenants are often unwilling to pay a price premium for buildings with these certifications. This finding further corroborates the data showing that only a small portion of the Non-Class A commercial office properties in Boston have received green certifications.

HOLD PERIOD

While commercial office property owners in the Boston market have diverse investment strategies, many property owners regularly buy and sell buildings based on market conditions. While no specific market data on Boston is available, national and international studies suggest that average building hold periods for commercial real estate are frequently less than ten years (Cheng, Lin, & Liu, 2010). Given that many building owners have investment strategies that do not anticipate owning a property over the long-term, energy efficiency investments with long paybacks, such as HVAC system replacements and building shell improvements, may not be economical. Survey and interview respondents reported that this hold-period issue was a considerable deterrent to making significant investments in building energy performance, even if other incentives are appropriately aligned. It was also noted that Non-Class A property owners may be more inclined to hold their properties for longer periods, potentially presenting unique efficiency opportunities for some of these building owners.

PROPERTY DEBT LIMITS

Some survey respondents reported that access to capital was a barrier to energy efficiency investments while others did not perceive this issue to be a major barrier. This finding is also supported by anecdotal evidence from the MassSAVE HEAT Loan program that many commercial property owners have not pursued this low-cost financing option. Many commercial office properties are acquired through highly leveraged transactions that include bank debt with covenants that limit the total debt a property can assume. Building owners report that, while access to debt is not an issue, many properties are unable to assume new debt given existing obligations.

UTILITY PROGRAMS

Survey respondents and interviewees mentioned the utility energy efficiency programs in several contexts as part of this project. Some large building owners felt as if they had taken full advantage of current utility program offerings and were eager to find new efficiency opportunities that could be supported by the efficiency program administrators. Smaller property owners reported having challenges accessing and understanding the incentive programs and receiving timely customer service. Given this diversity of experiences with the rate-payer supported efficiency programs, a more focused analysis of successes, challenges and opportunities related to commercial office property participation in the utility efficiency programs may be warranted.

HOTEL ENERGY EFFICIENCY BARRIERS

The following section discusses the major energy efficiency barriers identified by hotel owners during the survey and interview process.

COMPETING PRIORITIES

Survey respondents reported that energy efficiency investment was typically one of many competing priorities requiring capital investments in a hotel. Many of these other priorities frequently are more closely related to core hotel functions (improvements to rooms, lobbies, and meeting facilities) making

them more attractive investments from a hotel owner's perspective. This finding was also echoed by commercial office survey participants (improvements to lobbies and public areas), suggesting that prioritization of energy efficiency investment is a key barrier across commercial building types.

INSUFFICIENT INCENTIVES

Hotel survey respondents noted that current utility incentives were insufficient to drive adoption of deeper savings measures. Focus group participants in both the hotel and commercial office sectors noted that, while utility programs for lighting measures were adequately funded to drive market adoption, incentives for other technologies were not similarly adequate. Additionally, some focus group participants felt that some low payback measures could potentially be internally funded without the benefit of utility incentives and suggested that these incentive dollars could be better spent on deeper savings measures that were unlikely to meet internal hurdle rates.

OTHER SURVEY FINDINGS

It is interesting to note that hotel survey respondents reported that several potential barriers were not identified as major problems. Unlike in the commercial office survey, building hold period did not appear to be a major barrier to energy efficiency investment with virtually all hotel respondents reporting that this was not an issue. Similarly, hotel survey respondents also reported less difficulty navigating utility energy efficiency programs, with nine of 16 hotel owners reporting no major issues accessing rate-payer funded incentives.

BOSTON ENERGY REPORTING AND DISCLOSURE

In addition to asking questions about energy efficiency investment barriers, the survey sought feedback from commercial office building owners and managers as well as hotel owners related to the pending Boston building energy reporting and disclosure program. In February 2013, Mayor Menino introduced an ordinance to City Council which would require large property owners to report their building's energy consumption to the City on an annual basis. This information will then be publicly disclosed in order to improve market transparency related to energy use. The goal of the program is to better inform potential building tenants and future property owners about the energy performance of a building and to encourage building owners to increase their participation and investments in energy efficiency programs. Reporting to the City would take place through the use of the EPA's free Portfolio Manager software, which is also used for Energy Star certification.

Both hotel and commercial office survey respondents were largely aware of the City's proposed ordinance. Most of the survey respondents were also aware of the EPA's Portfolio Manager program, though only about half of all survey takers had used the program in the past. Most survey respondents were interested in a formal training to better familiarize them with the program.

When asked whether the building energy disclosure ordinance could motivate them to invest in energy efficiency if their properties scored lower than similar properties in Boston, nearly 80 percent of survey respondents indicated that the program would make it more likely they would invest in efficiency

measures. This result suggests that public disclosure of property energy performance data could have a substantial effect on the prioritization of energy projects within companies.

IMPLICATIONS FOR POLICY MAKERS

The findings of both the building stock analysis and the stakeholder surveys have implications for City policy makers, state government and utility efficiency program administrators. The following sections review some of these key findings and make policy recommendations that are intended to overcome some of the issues and barriers identified by this research.

IMPLICATIONS FOR RENEW BOSTON

Interview results suggest that commercial office properties and hotels present significant un-met savings opportunities for utility program administrators. Survey respondents and interviewees reported having only limited awareness of existing utility program offerings or of having taken advantage of utility-supported energy audits. Given these findings, commercial office properties have likely not taken full advantage of existing utility initiatives, presenting a large potential reservoir of energy savings opportunities. The Non-Class A building market, representing nearly half the commercial real estate square footage in the City, may be a particularly productive focus area, with several building owner speculated that lighting retrofit opportunities with two and three year paybacks being abundant in this building stock.

While the potential savings in the sector is likely substantial, the barriers identified by property owners and managers are likely more daunting than in other commercial property market segments. Given the diverse and fragmented nature of the commercial office market, efficiency program providers likely view commercial office properties as more difficult to serve than other customer classes such as municipalities, universities, and hospitals. Acknowledging these challenges, Renew Boston, the efficiency program administrators, the Green Ribbon Commissions' Commercial Real Estate Working Group and other interested stakeholders may wish to work collaboratively to develop strategies that target these commercial office buildings within Boston.

ENERGY EFFICIENCY FINANCE

Several cities have developed dedicated efficiency initiatives focused on commercial office properties. As a number of stakeholders mentioned that, even if incentives were properly aligned, some commercial properties are unable to support the additional debt that would be required to install energy conservation measures. The issue of existing debt covenants is an industry-wide challenge and New York City has attempted to address this problem through the New York City Energy Efficiency Corporation (NYCEEC), the city's recently established efficiency financing authority. NYEEC currently offers a managed energy services agreement (MESA) product designed to overcome issues related to property debt burdens (NYCEEC, 2012). While this early-stage program has had limited success so far, it is a public-private partnership model that could allow commercial office property owners to implement deep energy retrofits.

IMPROVEMENT IN TENANT ACCESS TO EFFICIENCY PROGRAMS

Anecdotal evidence from major tenants in Boston-area commercial office properties suggests that tenants that are not direct utility customers (i.e. tenants that pay for their utility consumption through their landlords) encounter challenges when attempting to access utility energy efficiency services, even when they own their own lighting and other energy related equipment. This issue can be particularly problematic in Non-Class A properties where both landlords and tenants may have limited staff capacity to navigate utility program administrative requirements. Renew Boston and the efficiency program administrators may be able to work in the near-term to better define the pathway for tenant access to the utility programs and to develop demonstration projects, communications materials and case studies that address this issue.

ENERGY ALIGNED LEASES

A number of stakeholders identified split incentives as a major barrier to energy efficiency investment in the commercial office property market. One frequently promoted solution to the split incentive problem is energy aligned leases. Under these agreements, property owners are granted the ability to recoup the costs of energy efficiency investments through a tenants lease payments, while tenants benefit from lower energy bills. Under some lease types, properly designed energy aligned leases can effectively remove the split incentive barrier to property owner efficiency investment. New York City's Mayor's Office of Long Term Planning has promoted energy aligned leases as an important tool for implementing efficiency projects in commercial properties and has developed a model energy aligned lease that could potentially be adapted by Renew Boston (NYC Office of Long-Term Planning, 2012b).

IMPLICATIONS FOR THE BOSTON BUILDING REPORTING AND DISCLOSURE PROGRAM

Research from this project also has potential implications for the City's proposed energy reporting and disclosure ordinance. This section reviews some of key recommendations for this pending City program.

OUTREACH, TRAINING AND EDUCATION

While many of the survey respondents and interviewees were familiar with EPA's Portfolio Manager program, most stakeholders were not currently using this platform to monitor the energy performance of their properties. This suggests that a significant outreach and education effort will be required to bring all properties affected by the disclosure ordinance into compliance. Results from the first year of public reporting in New York City indicate that many property owners were not able to accurately benchmark their properties using the Portfolio Manager tool.² The EPA is currently conducting a major update to the Portfolio Manager platform. These changes are expected to greatly improve the Portfolio Manager user-experience and improve the quality of benchmarking results. Despite these expected changes, it is likely that a substantial outreach and education effort will be required in order to ensure that self-reported building benchmarking results are as accurate as possible.

² First-year results from the New York City program included many properties that had EUI's that were unrealistically high or low for the reported building use. (NYC Office of Long-Term Planning, 2012a)

ACCESS TO BUILDING-LEVEL ENERGY DATA

Survey and interview results also confirmed that access to building-level energy use data will likely be a significant barrier to the whole-building benchmarking currently contemplated by the City ordinance. The commercial office and hotel markets have a diverse range of energy metering configurations including many tenants that have their electricity consumption directly metered by NSTAR. Under this circumstance, property owners do not have access to the whole-building energy use data that is required to accurately benchmark a property. Current drafts of the City's reporting and disclosure ordinance include a requirement for tenants to provide building owners with the utility consumption data required to benchmark a building. Additionally, the Green Ribbon Commission, ABC and the City have all encouraged NSTAR and National Grid to provide whole-building energy consumption data to property owners in order to facilitate benchmarking.³ Finally, State Senator Brownsberger has introduced legislation requiring utilities to provide whole-building energy consumption data to property owners (Brownsberger, 2013). Enactment of this legislation could considerably streamline implementation of the City's reporting and disclosure ordinance.

BEHAVIOR-BASED CONSERVATION STRATEGIES

The energy use index (EUI) ratings awarded through Portfolio Manager provides limited context regarding the energy performance of a property. A building with a high EUI may have inefficient building system but have limited occupancy. Conversely, properties with highly efficient lighting and HVAC systems may produce excessively high EUI scores if the property caters to high energy use industries. During stakeholder interviews, property owners commented that the public disclosure of building EUI scores could be misleading, particularly as the majority of energy consumed in a commercial property is controlled by the tenants. Given that one of the stated intents of the building reporting and disclosure program is to provide the real estate market with information about the energy performance of particular buildings, a landlord with a building that serves high energy-intensity lessees may be unduly affected by public disclosure of the energy consumption in their property. Tenant behavior will be an important factor in the performance of commercial properties (Greentech Media, 2013). A Better City's Challenge for Sustainability has also seen significant tenant energy savings from a conservation-based approach. Building owners may increasingly be interested in providing their lessees with energy conservation education programs that help tenants reduce their energy consumption. These behavior-based conservation strategies could be supported through the Mayor's Renew Boston initiative.

PERFORMANCE OF OLDER PROPERTIES

Results from the first New York City public disclosure indicated that older properties generally had superior energy performance than newer properties (NYC Office of Long-Term Planning, 2012a). A number of potential explanations have been proposed to explain this finding including:

- Older properties were likely designed without the benefit of central cooling systems and therefore have lower average cooling loads;

³ A number of City's with reporting and disclosure ordinances are benefitting from utility cooperation on data access issues including Chicago and its utility partner ComEd and New York City in conjunction with ConEd.

- Newer buildings were designed under building codes that did not take full advantage of shoulder-season outside air temperatures
- Newer buildings may tend to have tenants with higher-intensity energy consumption (ie. data centers, trading floors or law firms)

One particular concern of Boston’s Non-Class A property owners was that the value of their properties would be negatively affected by the reporting and disclosure ordinance. If the tendency found in New York City for older properties to have superior energy performance than new commercial office properties holds true in Boston, Non-Class A properties, as a group, may out-perform Class A properties with respect to energy performance. Given this, the concern that the disclosure ordinance would disproportionately negatively affected Non-Class A owners may be overstated and further education efforts to these property owners could help alleviate their concerns.

CONCLUSIONS AND NEXT STEPS

The size and diversity of Boston’s commercial office and hotel building stock make them both a critical and challenging energy efficiency target. Meeting the aggressive near-term goals of the Boston Climate Action Plan will likely require participation from all building market sub-segments from large Class A international REITs to small local owners.

The implementation of the Boston energy reporting and disclosure ordinance over the course of the next eighteen months will present a unique opportunity for the City of Boston to engage a significant proportion of the City’s commercial office and hotel property owners. While any new regulation is likely to be met with skepticism by the wider commercial real estate community, the City may be able to effectively mitigate some building owner opposition by working with trusted third parties to offer resources that will help reduce barriers to energy efficiency investment. As discussed in this report, a City sponsored commercial property program offering could include elements such as:

- Comprehensive EPA Portfolio Manager training and ordinance compliance assistance;
- Access to next-generation energy efficiency finance tools;
- Improved tenant access to utility efficiency program resources;
- Support for energy aligned leases, and;
- Comprehensive landlord and tenant education regarding behavior-based energy conservation strategies.

These offerings could greatly benefit property owners throughout Boston, not just the commercial real estate market. A comprehensive menu of City-sponsored efficiency program offerings developed in concert with utility efficiency program providers and the Boston Green Ribbon Commission could significantly impact the energy performance of the Boston’s commercial building stock while helping move the City towards its Climate Action Plan goals.

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