

# Green Market Development: Green Building Stock

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## I. Executive Summary:

The purpose of this project was to analyze the percentage of both residential and non-residential buildings in Columbus that achieve certification in STAR-qualifying energy-efficiency and green construction programs while developing creative strategic recommendations to enhance Columbus' green building initiatives.

The research objectives included:

- 1) Gather comprehensive data on the number and nature of all **non-residential** STAR qualifying certified buildings in Columbus over time.
- 2) Gather comprehensive data on the number and nature of all **residential** STAR qualifying certified buildings in Columbus over time.
- 3) Analyze all previously gathered data through STAR criteria, and make a strategic recommendation as to whether or not Columbus ought be a part of STAR Communities.
- 4) Use gap-analysis and benchmarking data to make strategic recommendations for amendment to Columbus policy and codes.

Through benchmarking against Seattle, Philadelphia, Chicago, and Cincinnati, our research team found that much of the growth in these cities' green buildings programs were rooted in reimbursement and loan programs that had high LEED minimum requirements, as well as promotion of specific green building best management practic-

es, such as green roofs.

From the research team's findings, three strategic recommendations were crafted for the City of Columbus. First, include within the Green Columbus Fund's minimum requirements LEED Silver and earning points in the LEED Operations and Maintenance metric. Second, incentivize beyond LEED (such as low impact development best management practices to complement green buildings). Finally, create a borrowing scheme either in addition to the Green Columbus Fund or within the Green Columbus Fund that would either fully or partially mitigate the additional upfront costs of green construction. Qualifying projects would need to incorporate energy efficiency upgrades.

## II. Introduction:

At the turn of the twentieth century, the quality and purity of water was a matter of life and death on a daily basis. Typhoid Fever is a bacterial infection spread from drinking fecal matter-contaminated water, and in 1904 nearly 200 Columbus residents died as a result of the infection. Four years later, in 1908, Columbus hosted an international experiment that focused on water treatment techniques that came to be known as "the Columbus Experiment." The two-pronged water-treatment and softening approach developed from this experiment cut the number of Typhoid deaths in Columbus in 1908 from 200 to 6. Today, Typhoid Fever is all but eradicated thanks to the Columbus Experiment, and these purification techniques are still in use today around the globe. The City set an international standard in water quality over one hundred years ago that is still replicated today. With this in mind, we focused our research with the intent of creating strategic recommendations that would set a new Columbus standard in sustainability.

This team's research focused on Columbus' green building stock, but the metrics through which we analyzed this building stock are rooted in the STAR Communities Rating System. STAR (Sustainability Tools for Assessing & Rating) Communities is branded as an effective system for measuring community sustainability. Our goals were two-fold:

- 1) Analyze the green building stock through STAR Communities and,
- 2) Make strategic recommendations for Green Memo III that would promote growth of green buildings in Columbus.

It is important to understand that we analyzed Columbus through a single criterion within a subcategory of one of STAR's seven multi-criteria categories. Within the Economy & Jobs Category, in the Green Market Development subcategory, a community is rated on whether or not it shows growth in both residential and non-residential STAR-certified green buildings.

#### **A. US Green Building Council's LEED Rating System:**

The STAR qualifying green construction programs are Green Globes, LEED, and Living Buildings. We didn't focus on Green Globes because it is so heavily criticized and there are simply no Living Buildings in Columbus yet. The research team decided to focus on LEED, because it is the most widely recognized green building standard and has an extremely flexible and evolving system.

LEED stands for Leadership in Energy & Environmental Design, and was created by the United States Green Building Council. LEED is a program that provides third-party verification of green buildings. Buildings must satisfy prerequisites and earn

points to achieve different levels of certification (USGBC). However, the prerequisites differ for each rating system and LEED gives teams the option to choose the best fit for their specific project (USGBC). This is why LEED is so commonly sought after not only for commercial buildings but also for residential buildings and entire neighborhood communities. There are currently five rating systems in place that are used based on applicability to your specific project (USGBC):

1. LEED for Building Design and Construction
2. LEED for Interior Design and Construction
3. LEED for Building Operations and Maintenance
4. LEED for Neighborhood Development
5. LEED for Homes

These LEED rating systems are based on a 100 point scale, plus six points for innovation and design, and four points for regional priority, totaling to a 110 point rating system. Homes then function on a 125 base point scale, plus an additional 11 for innovation and design. Each of the rating systems listed above then has credit categories. A few of the credit categories are sustainable sites credits, water efficiency credits, energy and atmosphere credits, materials and resources credits, and indoor environmental quality credits. The point system is then rated as follows, with platinum being the highest and most honorable rating:

Certified: 40-49 points  
Silver: 50-59 points  
Gold: 60-79 points  
Platinum: 80+ points

The United States Green Building Council additionally provides numerous online tools, databases, and libraries. They also provide methods to earn and achieve LEED professional credentials (USGBC). However, there are some critics of LEED as a green building standard. Some critics believe that applicants can “cheat the system” when

applying for LEED certification because of the point system. For instance, adding a bike rack to the front entrance receives one point, while so does the redevelopment of a brownfield site (Quirks). It is important to note that LEED is the only system that currently has the infrastructure and monetary funds to continuously update its metrics and prerequisites. This is one of the reasons why the building community has so heavily relied on the U.S. Green Building Council since the mid 1990's. Also, cities can take certain measures to prevent people from "cheating the system," such as Philadelphia has, and a few other cities we benchmarked.

### **III. Residential Buildings:**

When analyzing Columbus' residential green building stock, the research team immediately encountered problems finding useful information. During the planning phase of the project, the research team predicted that the private nature of most residential buildings would be a major hurdle in measuring Columbus on this metric, and this prediction was absolutely right. At this time, for Columbus, there is no conglomerated list or database of any kind of certified green residential buildings.

In anticipation of this challenge, we formulated an alternative method to measure residential building stock: through the EPA's Energy Star Portfolio Manager. If we could show that there had been growth in residential enrollment in the EPA's nationally renowned energy-efficiency program, then we could respond to STAR Communities and ask that they adjust their metric for residential buildings, and still earn Columbus points through their system.

After working with Professor Greg Hitzhusen to make contact with Jerry Lawson, the National Manager for the EPA's Energy Star Small Business & Congregations Network, our research team was directed to Jonathan Passe, Director of Energy Star's Residential Branch. Through Jerry, the team gained access to a yearly performance report of Energy Star certified homes listed below.

Figure 1

ENERGY STAR For New Homes - Quarterly Program Performance Report																				
ENERGY STAR-Labeled Homes By State																				
State	Pre1996	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
Ohio			11	20	71	98	540	2558	3537	5278	3252	3558	2143	2773	3574	5631	4813	3259	2406	43522
Akron, OH				2	8	15	24	41	46	53	166	147	92	210	139	767	681	730	706	3827
Canton-Massillon, OH			5	8	11	10	1	21	149	59	44	47	13	72	231	309	137	17	48	1182
Cincinnati, OH-KY-IN					1			5	41	76	33	68	311	486	605	1420	1180	787	638	5651
Cleveland-Elyria, OH			2	4	29	48	111	502	489	764	589	398	179	125	228	347	557	600	206	5178
Columbus, OH			2	1	1	1	395	1921	2681	3959	2040	2683	1197	1429	1686	2105	1666	649	487	22903
Dayton, OH				1	1	5		15	12		142	108	101	86	101	173	132	45	123	1045
Lima, OH									2	2	49		5	3	2	6	3	2	3	77
Mansfield, OH								2		1	41	1	3	1	5	6	2			62
Springfield, OH									1		1			6	2	2	2	4	3	21
Toledo, OH			2	3	7	4	7	25	20	52	74	24	98	178	201	170	166	258	156	1445
Weirton-Steubenville, WV-OH													1	2	17	121		52	2	195
Wheeling, WV-OH														2	3	1	5	6	3	20
Youngstown-Warren-Boardman, OH-PA					1	3	1				118	43	16	2	10	14	85	23	111	427
Other					10	14	2	25	97	193	31	65	132	151	238	236	204	52	39	1489
<b>Total</b>			11	20	71	98	540	2558	3537	5278	3252	3558	2143	2773	3574	5631	4813	3259	2406	43522

**Ohio's ENERGY STAR-Labeled Homes**

**Figure 1.** This table provides performance data on annual and total ENERGY STAR certified residential homes for the state of Ohio.

This report clearly shows that the number of Columbus residential buildings that are Energy Star labeled has increased drastically over the past 15 years, with much of this



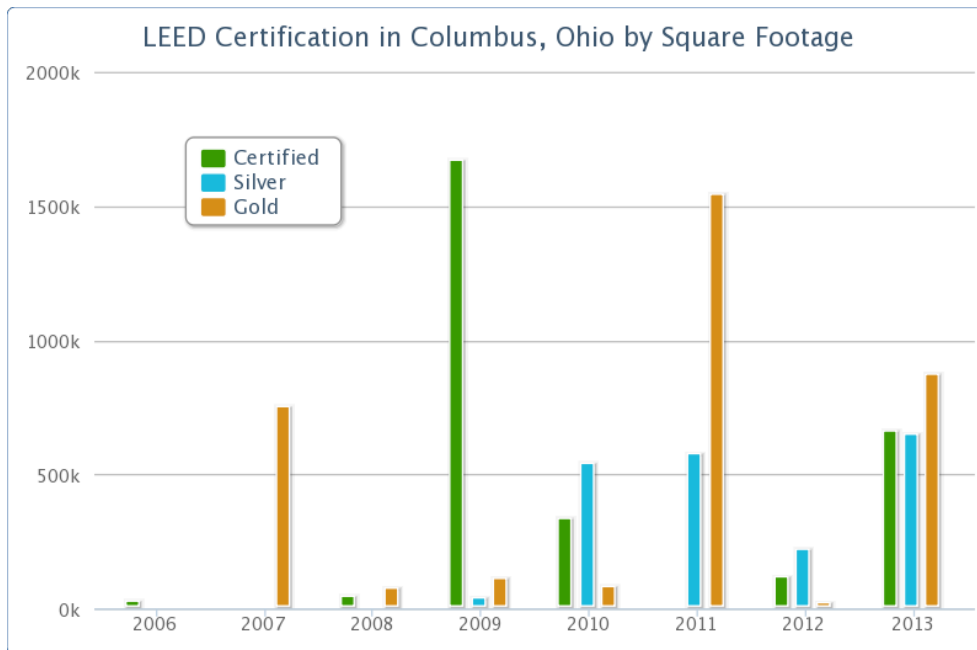
growth spike between 2002 and 2004. While STAR doesn't award points for Energy Star labeled homes, the team believed it to be an important trend nonetheless.

#### IV. Non-Residential Buildings

After looking into residential buildings, our team researched non-residential buildings. Immediately, the team realized that finding information on non-residential LEED buildings was far easier. Through email, Jacob Kriss, the Media Specialist for the U.S. Green Building Council, provided us with some very useful information. He had an updated spreadsheet that listed all of the LEED certified and registered (pursing certification but not yet certified) projects in Columbus. Another data source that Kriss directed us to was the Green Building Information Gateway. This data source reveals green activities, green buildings, and collections within the City. It also reports ENERGY STAR plants and buildings, and recent activity. The Green Building Information Gateway then breaks down cities' LEED certification by gross square footage. Columbus' graph looks like the following:

Figure 2.

**LEED Certification in Columbus, Ohio by Square Footage.**



**Figure 2:** This graph shows how much new LEED square footage has been constructed each year in Columbus, separated by certification type.

Source: <http://www.gbig.org/places/5176>

The research showed that there has been an increase in total certified square footage over time. However, the levels of certification have been sporadic between certified, silver, and gold. It is also important to notice that there are not any platinum certified buildings. In the interest of examining methods to strengthen this growth, our research team chose to benchmark other city's green building initiatives.

**V. Benchmarking:**

Our benchmarking analysis began with in-depth online searches to collect specific performance data related to the initiatives, programs, and financial incentives that are

currently being conducted in Seattle, Philadelphia, Chicago, and Cincinnati. This research allowed the team to get an understanding of the details and complexity of these programs. From our research we then performed formal benchmarking in order to measure the feasibility of implementing such programs in Columbus, Ohio. We compared Columbus' green building initiatives to cities that are either leaders in green building growth or that have had more success with green buildings while being similar in size to Columbus. Our benchmarking and gap analysis results yield several recommendations as to what programs and financial incentives Columbus could provide to increase residential and non-residential green building stock.

#### A. Seattle, WA

Since 2000 Seattle has implemented several different programs and policies, including providing financial incentives to developers and homeowners that have directly led to Seattle's rise as a leader not only in green building growth, but sustainability. Though the research team found that Seattle has a very diverse and impressive set of programs and incentives offered to developers and homeowners, the data presented below are considered most applicable for Columbus.

One of the most important programs that has helped promote green building design and encourage energy efficiency has been Seattle's Sustainable Sites and Green Buildings Program. Adopted in October 2013 by Resolution 31326, the Sustainable Sites and Green Buildings program "aims to maximize the environmental quality, economic vitality, and social health of our city through the design, construction, operation, maintenance, renovation, and decommissioning of City-owned buildings and sites." As

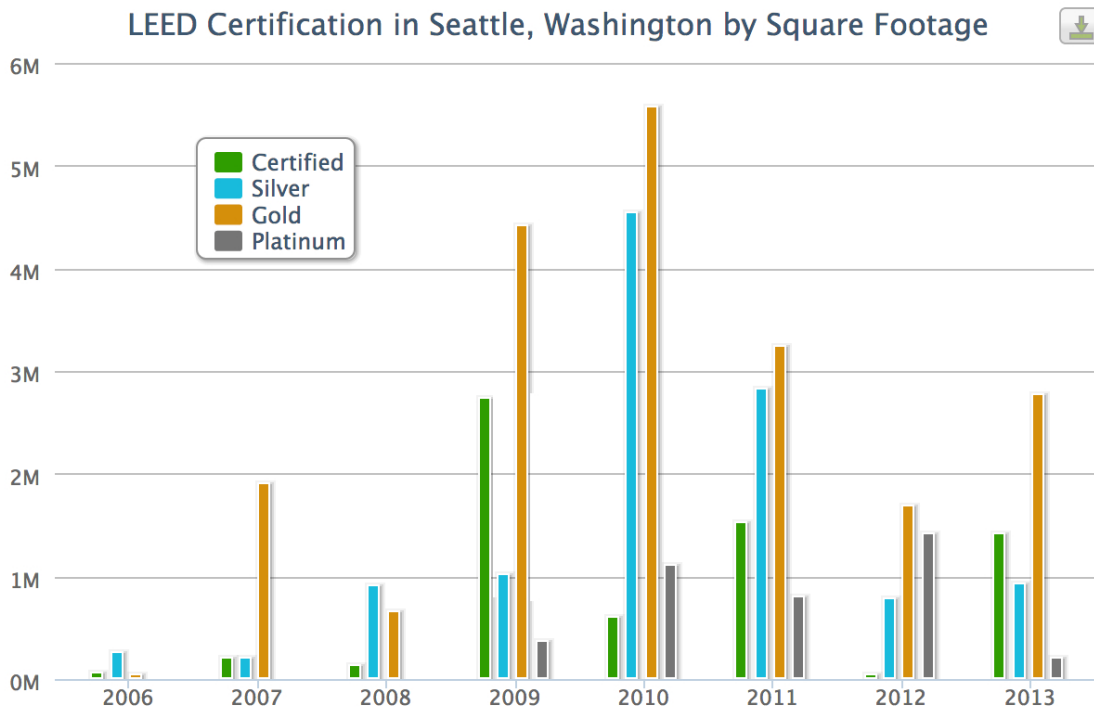
an extension of Seattle's first green building policy established in 2000, this program includes more stringent goals including:

- New construction and renovations of any major project exceeding 5,000 square feet require a LEED gold certification or Living Buildings Challenge as a substitute, and must meet key performance requirements for energy and water efficiency.
- New construction and renovations of any project smaller than 5,000 square feet are required to use Capital Green, an evaluation tool that aids project planning and development.
- All project sites are required to follow best management practices in the planning, development, and construction of a project.

Another program helped increase the sustainable green building stock within Seattle through a variety of green building permit incentives, including Priority Green Expediting. These permit programs help give developers and homeowners incentive to build green by speeding up the review, routing, and processing time of a project that meets a particular set of requirements. Some of these eligibility requirements include,

- 15% improvement from the 2012 Seattle City Code for non-residential or 20% improvement from the 2012 Seattle Energy Code for residential projects.
- Incorporation of specific plumbing fixtures and permeable pavements.
- Minimum size of 2,200 sq.ft. while achieving LEED gold or platinum certifications, or Built Green 4 Star or higher for residential homes.

Figure 3



***LEED Certification in Seattle, Washington by Square Footage***

**Figure 3:** This graph shows how much new LEED square footage has been constructed each year in Seattle, separated by certification type.

Source: <http://www.gbig.org/places/2712>

**B. Philadelphia, PA**

Philadelphia was chosen because it is located in the same region as Columbus, and is of similar size. The mayor’s office of sustainability in the City of Philadelphia has taken a number of steps to become a more sustainable city. Similar to the Green Memos here in Columbus, Philadelphia generates a Greenworks Progress Report. Philadelphia publishes the city’s latest Greenworks 2013 Progress Report on their sustainability

website. This report describes more than 160 initiatives in five sustainability target areas: energy, environment, equity, economy, and engagement. One of the primary initiatives is to reduce citywide building energy consumption by 10%, and in their progress report, the city lists and explains all initiatives completed, in progress, and planned for the future for each and every goal.

Philadelphia has supported a wide range of actions and initiatives to accomplish the goal of reducing citywide building energy consumption by 10%. One initiative was making the Philadelphia High-Performance Building Renovation Guidelines available on the City's sustainability website. This was a tool given by the managing director to the city government, and is a comprehensive 100-page document. "This document was structured to focus on typical city renovation projects and provide guidance for considering renovation sequence, material selection, construction practices, energy use, and operating implications and interrelatedness of building improvements that constitute high performance" (Philadelphia High-Performance Building Renovation Guidelines). It was also designed to help improve quality of city initiatives, support the city's work in newer fields, and assist city staff in the planning and budget phases of these projects.

Another action Philadelphia has taken to reach their goal was passing the City of Philadelphia Building Energy Benchmarking Ordinance. "In 2012, Philadelphia passed this legislation, making them the sixth city in the country to require annual reporting and public disclosure of energy performance scores for commercial buildings" (Philly Building Benchmarking). The legislation requires commercial building owners or managers with an indoor floor space of 50,000 square feet or more to collect and report their data to Energy Star Portfolio Manager (Philly Building Benchmarking). This free online tool is

a great way to share best practices in building efficiencies. Buildings can compare themselves to other like-minded buildings, and physically observe the amount of money they could be (or are) saving in regards to energy costs.

Lastly, Philadelphia has also taken a more direct approach, addressing green building growth standards through legislation. In 2009, Philadelphia passed a bill that requires all new construction and major renovation projects of 10,000 or more gross square feet of enclosed and conditioned building space funded primarily by city dollars to be LEED silver (Mayor's Office of Sustainability). This bill also requires that at least five points be earned in the category of Energy and Atmosphere to help achieve other sustainability initiatives prioritized by the City. There is also a requirement that projects must be designed to use at least 20% less energy than basic, code compliant structures (Mayor's Office of Sustainability). However, there is a clause that allows for the dismissal of this ruling if it conflicts with historic preservation goals, or if LEED certification will cause overall life-cycle project costs to exceed similar projects where certification is not being pursued by more than 10% (Mayor's Office of Sustainability).

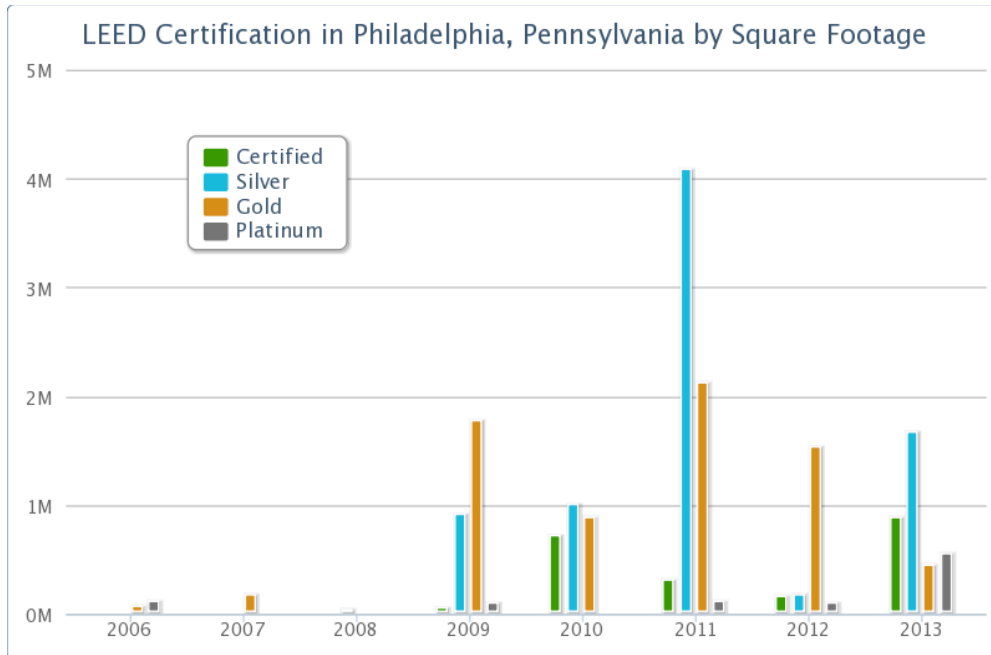
Similarly, in 2010, a second bill was passed that requires commercial buildings of certain sizes to have roof coverings that are white or Energy Star certified as reflective. This bill also has a clause allowing exceptions for roofs that support living vegetation, such as green roofs, roof areas used for outdoor recreation by building occupants, areas including or adjacent to rooftops with solar photovoltaic, or a roof area with less than 3% of the gross floor area of the building.

It is quite clear that Philadelphia has set some ambitious goals for green buildings. It is also clear in the action that they have taken over the past five to ten years

that the City is very committed to sustainability. Through a diverse range of actions they have accomplished much. The graph below shows how much the City of Philadelphia has been succeeding in LEED certified building growth.

Figure 4.

**LEED Certification in Philadelphia, Pennsylvania by Square Footage.**



**Figure 4:** This graph shows how much new LEED square footage has been constructed each year in Philadelphia, separated by certification type.

Source: <http://www.gbig.org/places/5758>

**C. Chicago, IL**

Another city the research team decided to benchmark with Columbus was Chicago due to their recognition as an international leader in green buildings. With 133.5 million square-feet of LEED Certified buildings, nearly half of which are LEED Gold



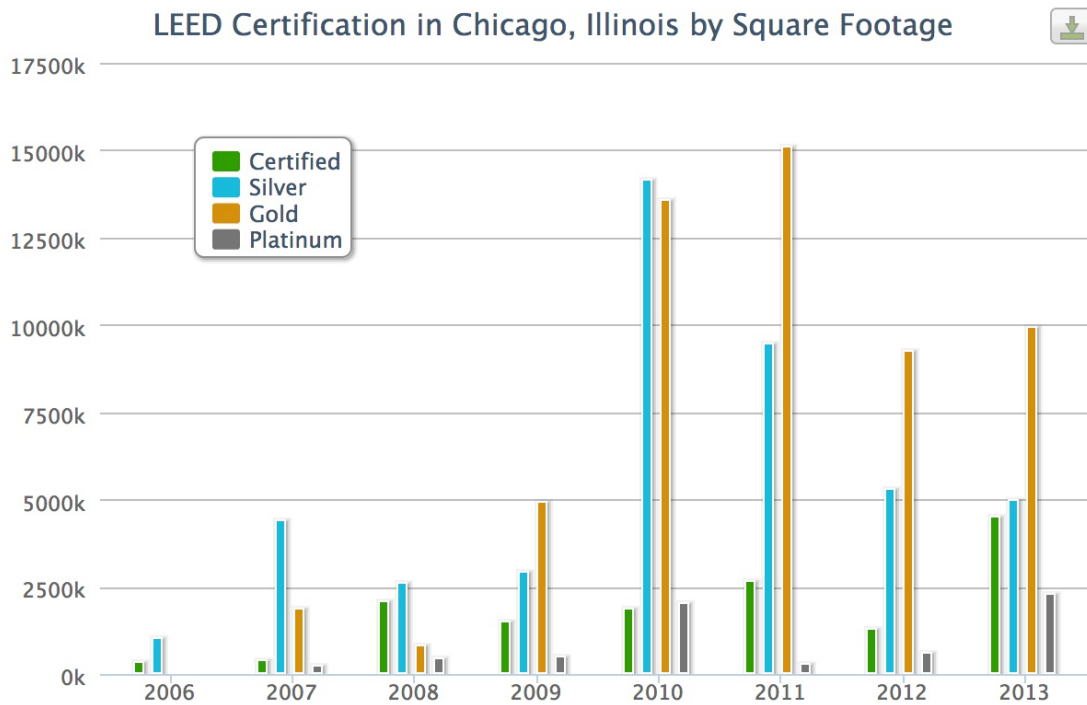
Buildings, the team realized that there was more to Chicago's initiatives than a progressive population and financial incentives.

What truly allows Chicago to stand out as a leader in green building initiatives is their implementation of green roofing. The City of Chicago provides similar direct and indirect financial incentives (everything from cooperating bank loans to tax increment financing), all of which require a green roof that covers at least 25%-100% of the building.

This focus on green roofing comes from Chicago's long struggle with the heat island effect. Historical temperatures have gotten so high in Chicago that in a 1995 heat wave, there were nearly 750 heat-related deaths reported over a week. Cases such as these spurred the third-most populous city in the United States to enact green building policies with an extreme focus on green roofs, because they are so effective at mitigating the heat island effect.

This unique focus on green roofing has had another effect - it has provided Chicago with a kind of sustainability brand, a visual element representative of their commitment to green buildings. With each new roof, the brand grows stronger, further strengthening the city's reputation and quite possibly attracting new residents who value such amenities while creating a unique identity for Chicago.

Figure 5



**LEED Certification in Chicago, by Square Footage**

**Figure 5:** Graph of levels of LEED certified buildings in Chicago, IL that are over 5,000 square feet.

Source: <http://www.gbig.org/places/2712>

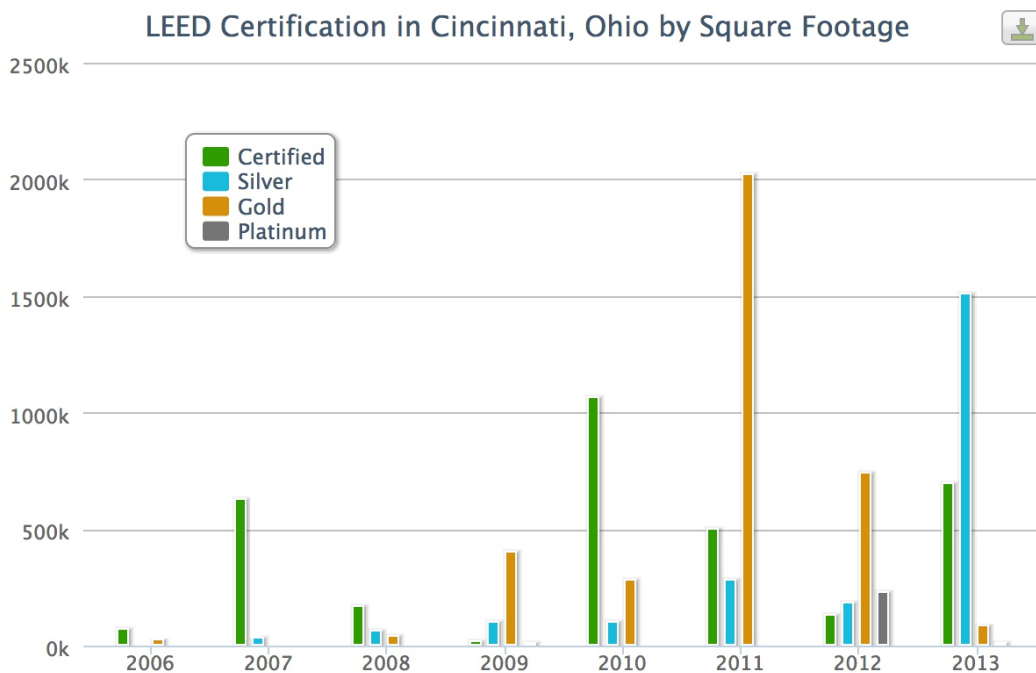
**D. Cincinnati, OH**

The research team contacted Jeremy Faust, the Strategic Business Development Director for the Greater Cincinnati Energy Alliance to learn about Cincinnati’s successful green building initiatives. Faust informed the research team that Cincinnati’s green building growth was spurred by the city’s borrowing program: Cincinnati offered loans that covered the upfront costs of green building development for residential and

commercial property owners. Faust also pointed out that the payback rate on Cincinnati's loans wouldn't be greater than energy-efficiency savings generated for participating residents and property owners.

While not considered as much of a leader in green buildings as Seattle or Chicago, Cincinnati's program has been more successful than Columbus' in spurring green building growth. The research team's next step was to look home and see what Columbus has been doing to promote green building growth.

Figure 6



**LEED Certification in Cincinnati, Ohio by Square Footage**

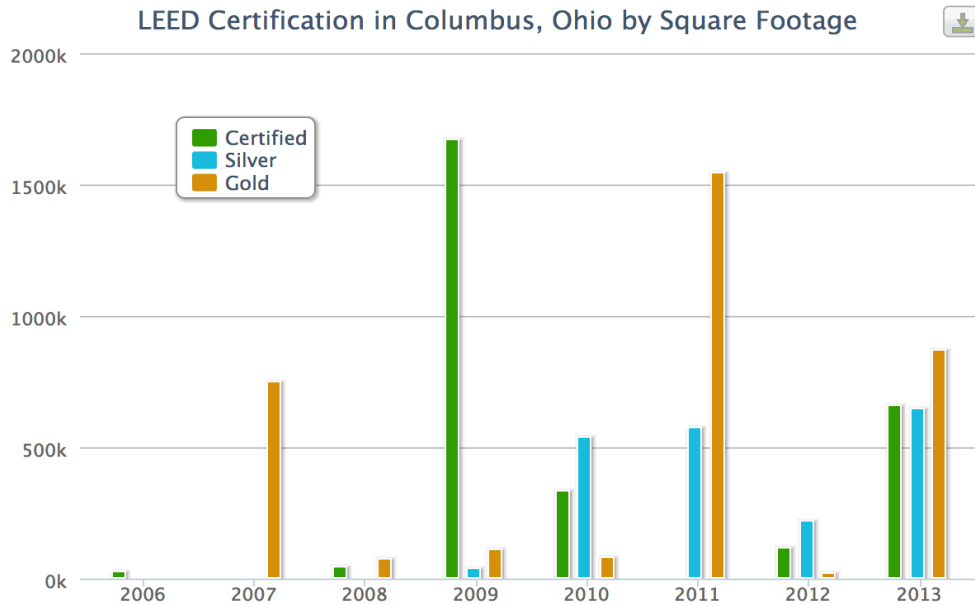
**Figure 6:** This graph shows how much new LEED square footage has been constructed each year in Cincinnati, separated by certification type.

Source: <http://www.gbig.org/places/5167>

## E. Columbus, OH

Columbus' primary driver of green building growth comes from the Green Columbus Fund which is a reimbursement grant program created by Mayor Michael Coleman in 2005 with Green Memo I, and continued with Green Memo II in 2010. The fund offers reimbursement of the LEED certification fee for any building that is *at least* LEED certified (the minimum achievable level), and earns points through the LEED system in select categories under New Construction and Major Renovation (NC), Core and Shell (CS), and Commercial Interior (CI). Up to triple this amount is offered in additional reimbursement for mitigating brown fields, earning points in the Existing Buildings: Operations & Maintenance LEED Category, or achieving higher levels of LEED certification. While these are strong incentives for promotion of green building growth, when compared to leaders and similar cities (even Cincinnati), Columbus can do better.

Figure 7.



***LEED Certification in Columbus, Ohio by Square Footage.***

**Figure 7:** This graph shows how much new LEED square footage has been constructed each year in Columbus, separated by certification type.

Source: <http://www.gbig.org/places/5176>

By no means is Columbus lacking in sustainable initiatives throughout the city, but in order for the city to become a leader, further steps must be taken to increase Columbus' green building stock. Having benchmarked all of these cities and compared their initiatives to Columbus', we suggest four strategic recommendations that will fuel new growth in Columbus' green building stock.

## VI. Gap Analysis

### A. Recommendation 1: Update LEED Metrics

A common strategy found in nearly all the cities researched but lacking in Columbus was an updated metric for LEED buildings. Therefore the first recommendation is that the City of Columbus should update the minimum LEED rating in the Green Columbus Fund from certified to silver. We believe this is a natural first step for the city to take in order to increase the total sustainable green building stock in Columbus. This will not only help promote green buildings but it will ensure construction of more impactful buildings within the city.

Another metric the City of Columbus should update to help increase green building growth is the Operations and Maintenance LEED metric. We believe this should be updated from an additional requirement in the Green Columbus Fund to a minimum requirement. This way developers within Columbus are not abandoning aged infrastructure and the City is not paying out triple the LEED certification fee to incentivize this.

### B. Recommendation 2: Permit Expediting System

We also recommend that Columbus adopt an expedited permit program for LEED gold or platinum projects or projects that will help remediate a brownfield site. This will allow sustainable green building stock to increase in Columbus. More importantly, an expedited permit system for LEED gold and platinum buildings will also promote higher quality projects by providing incentives to developers.

Since the original recommendation of the expedited permit system, our research team has been informed this cannot currently be implemented in Columbus. According

to Paul Freedman of the Department of Building and Zoning Services, the problem with this permit system is that Columbus' Department of Building and Zoning Services has already agreed to rigorous, expedited review time in exchange for allowing their fees to fund the Department. This agreement allows the Building and Zoning Services Department to set fees according to the costs actually incurred by the city.

### C. Recommendation 3: Incentives Beyond LEED

Our research team's third recommendation is that the City of Columbus provide incentives for green constructions beyond LEED. This would include all forms of green roofing and Low Impact Development, such as rain gardens or permeable pavements. This gives an opportunity to property owners who may not be able to afford retrofits or LEED certification while also creating a strong visual representation of Columbus' role as a leader in sustainability. Columbus could expand the Columbus Green Fund to help fund these sorts of green building initiatives, or create a new fund or program. This recommendation would not earn additional points in the STAR metrics, but it would provide a visual component to Columbus' sustainability initiatives while complementing the low impact design of the City's green buildings.

### D. Recommendation 4: Borrowing Program

Our final, and boldest, recommendation is modeled after Cincinnati's borrowing program. While Columbus's Green Fund focuses on reimbursing the LEED certification fee to property owners who invest in green buildings, this does nothing to overcome the biggest hurdle for green development: the stigma of the increased upfront cost. While

the difference is marginal, we believe that the key reason for Cincinnati's success is the fact that they loan grant money, upfront, *before* construction has begun.

The team recommends creating a similar program that offers either partial- or full- upfront loans that target the costs of construction as opposed to reimbursing the LEED certification fee. For a construction or renovation project to qualify for these loans, the proposal would have to incorporate some kind of energy-efficiency upgrade. This would give property owners a quicker return on investment, which would ensure that Columbus could expect the loan to be paid back quickly with some of these energy efficiency savings.

This borrowing program would exist as either a part of the Green Columbus Fund, or as a separate fund. By tackling the upfront costs of green construction, Columbus could expect to spur exponential growth in the city's green building stock.

## **VII. Limitations & Recommendations for Future:**

One limitation to our research was the difficulty of gathering and analyzing private data. There are many different types of buildings we could have researched, including private and public commercial buildings, multi family complexes, and residential homes. However, because of the difficult nature of obtaining private information, we chose to focus on public non-residential buildings.

### **A. Further Research on LEED Residential Buildings**

Due to stringent time constraints we were not fully able to complete all aspects of the project we initially intended in our proposal. Because of this we have several recommendations for further research where we believe this project can grow in the future. Our first recommendation would be further in-depth analysis of LEED residential build-



ings. Even though we had trouble finding information on LEED homes, there are likely still ways to collect information on these homes and the nature of their growth. We would recommend that future groups conduct personal interviews with local and non-local residents who own LEED homes to learn more about the value of green residential homes and how these values relate to the green building stock of the whole city. We also would like to have been able to conduct more in-depth research into programs that incentivize these LEED homes. However, benchmarking and performing gap analysis on non-residential programs proved to be very time consuming for our four month time period.

#### B. Building and Zoning Code Benchmarking and Gap Analysis

We also recommend further benchmarking and gap analysis of Columbus' building and zoning codes. Like residential homes, we would have liked to see what policies are in place in other cities compared to Columbus. We would recommend future groups look into where these differences lie and what Columbus can do to further improve its zoning codes in order to accommodate further growth in sustainable green building stock.

#### C. Cost-Benefit Analysis for the City of Columbus

Our final recommendation for further research is a cost-benefit analysis of green building stock for the city. As a group we were pretty happy with our recommendations for the Columbus Green Team from our benchmarking and gap analysis but we were never positive on how economically feasible they were. That these programs have worked for cities like Seattle, Philadelphia, and Chicago does not mean that they would

work in Columbus. We think one key goal for further research should be a cost benefit analysis of our three recommendations.

#### **VIII. Conclusion:**

Compared to various other cities around the US, Columbus is not as much of a leader in sustainability as we would like to be. The City's green building programs do offer sizable incentives but the biggest short-coming of these programs is their inability to mitigate the initial cost of development. This higher upfront cost of green construction is the industry's biggest hurdle, and Columbus does little to mitigate that cost. Understanding this, we have some concluding thoughts on Columbus.

We recommend *not* joining STAR Communities. While there has been growth in STAR certified green buildings in non-residential buildings, the inability to quantify similar growth in residential buildings means Columbus would not meet STAR metrics. The team asks that STAR reconsider this metric, as there is no real conglomeration or database of residential green constructions in Columbus yet.

Columbus has enormous potential for promoting sustainability at a city level. If the City made some adjustments to its green building initiatives, there would be substantial new growth in these types of buildings and development.

It is important to remember that being a leader is tied to Columbus' identity. Tapping into Columbus' potential means living up to that identity and acting like a leader. Over 100 years ago, Columbus set one of the first environmental standards in water quality, and it is still replicated today. Today, Columbus ought to aim to set a similar

standard in sustainability, and can do so by taking some further steps in promoting green building growth in the City.

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X. Appendix:

***Dataset 1: seattle\_financial\_incentives.pdf***

Source: [seattle.gov](http://seattle.gov), Department of Sustainability and Environment

Description: This is a list of financial incentives the City of Seattle provides for commercial buildings.