

Cincinnati Takes the Lead in LEED:
Effects of a real estate tax abatement
for LEED certification
on
development and green building

by

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ABSTRACT

Local governments have played an important role in the adoption of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System™. Many local governments offer incentives for the private sector to utilize this green building rating system, including density bonuses, expedited permitting, rebate of permit fees, and tax abatements. In May 2007, the City of Cincinnati, Ohio passed an ordinance that provides an automatic 15 year, 74% real estate tax abatement for commercial new construction that achieves LEED certification. Cincinnati's LEED tax exemption program is unique because it combines a large tax break, available for a long period of time, for a relatively low level of achievement in the LEED rating system. The purpose of this project was to determine if Cincinnati's LEED-CRA tax exemption program is encouraging LEED building within the City of Cincinnati and if it is promoting the use of green building practices through the LEED rating system. A comparison of the volume of LEED projects in Cincinnati and other large Ohio cities revealed that the instatement of the LEED-CRA tax abatement program is likely to have had an effect on the recent upward trend in LEED-registered projects in Cincinnati. Owners of LEED-registered projects and developers without LEED projects in the Cincinnati area were surveyed, with the goal of finding out their motivations for building LEED and their perceptions of the City's tax abatement program. Most respondents liked Cincinnati's current LEED tax abatement program, highlighting it as a simple and easy-to-use program. They thought the program was a motivating factor within the City limits, which may be one indicator of the program's success as an economic development tool. The tax abatement was also found to be an incentive to use the LEED certification system on projects that would otherwise not have been built to LEED standards.

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LIST OF ABBREVIATIONS

CI	Commercial Interiors
CS	Core and Shell
CRA	Community Reinvestment Area
LEED	Leadership in Energy and Environmental Design
LEED AP	LEED Accredited Professional
LEED-CRA	Cincinnati's tax abatement for LEED certification under the Community Reinvestment Area program
NAIOP	The Commercial Real Estate Development Association (formerly the National Association of Industrial and Office Properties)
NC	New Construction
USGBC	United States Green Building Council

Introduction

How does LEED work?

The U.S. Green Building Council (USGBC), a non-profit organization, has

Table 1. Types of LEED Rating Systems

• New Construction	• Retail
• Existing Buildings	• Healthcare
• Commercial Interiors	• Homes
• Core & Shell	• Schools
• Neighborhood Development (in pilot)	

assumed an important role in the area of American sustainable building by providing a third-party rating of performance in energy and environmental design of buildings. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ uses standardized criteria to promote “five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.”¹ There are several types of LEED rating systems, based on the type of construction and the function of the building (Table 1), and each has its own set of pertinent criteria. Ratings are allocated on a point system, and developers earn one point for each energy-efficient or environmentally-friendly component added to the project. For example, New Construction projects can earn a possible 69 points by meeting rating system criteria, such as certified wood and low-emitting paint, during the construction process. There are four levels within the rating system: Certified, Silver, Gold, and Platinum. In the case of New Construction, a project must earn 26-32 points to reach the Certified level, 33-38 points for Silver, 39-51 points for Gold, or 52-69 points to be at the Platinum level.²

The benefits of green construction can reach beyond the energy savings and environmentally-friendly approach. For many, green building can be a smart business

¹ USGBC, *LEED Rating Systems*, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222>, Accessed Sept. 2, 2008.

² USGBC, *LEED Checklist: New Construction*, <http://www.usgbc.org/ShowFile.aspx?DocumentID=3998>, Accessed Sept. 2, 2008.

choice. The marketing appeal of a LEED-certified building can quickly draw tenants to commercial spaces, and redesigned spaces with increased natural light can create an appealing environment for workers.³

Government incentives for green building

The multi-faceted positives of the LEED rating system have captured the attention of municipal governments nationwide, and many are requiring that new public building projects reach a certain level of LEED certification. At the cutting edge of this trend is Greensburg, Kansas, which is requiring that all new public buildings achieve the Platinum level of certification as the city rebuilds from a tornado disaster.⁴ In Cincinnati, Ohio, a City Councilmember presented a motion on May 1, 2006 that “any new municipal buildings in Cincinnati be constructed to LEED certification.”⁵

Apart from requiring green building standards for public projects, local governments can also provide incentives that are intended to attract commercial developers to implement green building, without imposing mandates on the private sector. This is perceived as a strategy for gaining momentum for green building,⁶ since

³ Broughton, Jim, *Green Building Costs, Savings and Value*, Environmental Design + Construction, Three part series 11/1/06, 12/1/16, 1/1/07, <http://www.edcmag.com/Articles/Column/5a2904d438fde010VgnVCM100000f932a8c0>, Accessed Sept. 2, 2008.

⁴ Greensburg, Kansas Commits to LEED Platinum, Jan. 4, 2008, Environmental Design + Construction, http://www.edcmag.com/Articles/Breaking_News/BNP_GUID_9-5-2006_A_1000000000000227426, Accessed Feb. 14 2009.

⁵ Cincinnati City Council, *Motion from Laketa Cole and Chris Bortz*, City Document #200600451, May 1, 2006, City of Cincinnati, http://City-egov.cincinnati-oh.gov/Webtop/ws/council/public/child/ResultSet?w=doc_no%3D%27200600451%27&rpp=-10, Accessed Dec. 6, 2008.

⁶ Wertheim, Nancy, *Retail Strategy*, A white paper from Deloitte Tax LLP, <http://www.awarenessintoaction.com/whitepapers/Deloitte-retail-strategy-federal-state-tax-Incentives-green.html>, Accessed Feb. 14, 2009.

developers tend to prefer incentives over mandates.⁷ Some of the main types of government LEED incentives are *density bonuses*, *expedited permitting*, *reduction or rebate of permit fees*, and *tax abatements*.^{8,9}

Density bonuses allow developers to build more units or square footage on a property than is typically allowed. This type of incentive has been used in the past for conservation-based developments, where high density on one part of a property allows conservation of another part, and for low-income housing.¹⁰ An example of a density bonus LEED incentive is in Pittsburgh, Pennsylvania, where developers can build an additional 20% on the permitted project height when earning LEED NC or LEED CS certification.¹¹

Expedited permitting gives eligible developers priority in receiving building permits. A leading example of this incentive is Chicago's Green Permit Program. In this program, commercial developers are promised an expedited permit in less than 30 days if LEED certification is earned. With higher levels of LEED certification the time to received an expedited permit can be reduced to 15 days and the consultant review fee can be waived. The increased level of customer service that is given to program participants

⁷ Yudelson, Jerry quoted in *Green Building Consultant Documents Proliferation of Local Government Green Building Incentives*, Yudelson Associates, Jan, 10, 2008, <http://www.greenbuildconsult.com/news/info/green-building-consultant-documents-proliferation-of-local-government-green/>, Accessed Feb. 14, 2009.

⁸ USGBC, *Summary of LEED Government Incentives*, July 2008, <http://www.usgbc.org/showfile.aspx?documentid=2021>, Accessed Sept. 2, 2008.

⁹ American Institute of Architects, *Local Leaders in Sustainability: Green Incentives*. http://actrees.org/files/Research/aia_greenincentives.pdf, Accessed Feb. 14, 2009.

¹⁰ Center for Land Use Education, *Planning Implementation Tools: Density Bonus*, University of Wisconsin-Stevens Point. <http://www.uwsp.edu/CNR/landcenter/pdffiles/implementation/densitybonus.pdf>, Feb. 14, 2009

¹¹ All examples of tax incentive programs are taken from the USGBC's *Public Policy Search database*, <http://www.usgbc.org/PublicPolicy/SearchPublicPolicies.aspx?PageID=1776>, Dec. 10, 2008.

is intended to decrease the risk that developers assume in trying new green building strategies.¹²

Rebate or reduction of permit fees can allow developers to offset some of the upfront costs of green building. In Tampa, Florida, developers can receive a 20-80% rebate on the building permit fees for commercial projects that are LEED certified, with the percent of rebate being dependent on the level of LEED certification.¹³

Real estate tax incentives

Tax incentives can be offered at a number of levels, such as reductions on income tax or sales tax for goods and services related to green building. This paper focuses on green building incentives based on property taxes. There are examples of property tax abatement programs for LEED building around the United States from state, county, and city governments. Presented here are some of the tax abatement programs that have been frontrunners in this type of government initiative.

The *State of Nevada* passed a bill in June 2005 providing a partial abatement of up to 50% of property taxes for 10 years for buildings that earn at least a Silver LEED certification.¹⁴ The bill was a success in terms of the promotion of green building, but there was contention regarding the impact that the bill had on the state budget. In May 2007 state legislators voted to suspend the tax abatement program, but the suspension

¹² Olsen, Erik, *The City of Chicago Green Permit Program*, Building Safety Journal, August 2007, <http://www.iccsafe.org/news/green/pdf/0807BSJ24.pdf>, Accessed Feb. 14, 2009.

¹³ USGBC, *Summary of LEED Government Incentives*.

¹⁴ Nevada State Legislature, *Partial abatement of certain property taxes for buildings or structures that meet certain standards under Green Building Rating System*, Nevada Revised Statutes 701A.110, The State of Nevada, <http://www.leg.state.nv.us/NRS/NRS-701A.html#NRS701ASec110>, Accessed Feb. 14, 2009.

was vetoed by the governor.¹⁵ In June 2007, the legislation was changed so that the tax abatement was reduced to a maximum of 35% abatement, depending on the level of LEED certification.¹⁶ Despite changes in legislation, Nevada's statewide program led the way for other initiatives at that scale. Currently New Mexico and Virginia also offer state-wide tax incentives for green building.¹⁷

Chatham County, a coastal area in southeastern Georgia that includes the City of Savannah, has passed an ordinance that offers a tax abatement for projects that achieve the Gold level of LEED certification. It is a 100% property tax abatement for five years, after which the amount of the abatement tapers off until it is a 20% abatement in the tenth and final year.¹⁸ *Baltimore County*, Maryland developed a program offering tax credits to new commercial building projects that achieve at least LEED Silver certification. It offers a 50% tax credit for LEED Silver projects, 60% for Gold, and 80% percent for Platinum New Construction projects. The incremental tax credits in Baltimore County are available for Core and Shell and Existing Buildings projects as well, although the percentage amount of the credit is lower for both of these.¹⁹

¹⁵ Del Percio, Stephen, *Nevada Governor Vetoes Bill Suspending Green Property Tax Abatement Program*, greenbuildingsNYC, May 16, 2007, <http://www.greenbuildingsnyc.com/?p=195>, Accessed Sept. 2, 2008.

¹⁶ Nevada State Legislature. Assembly Bill 621, The State of Nevada, http://energy.state.nv.us/Rule_Making/R_116-07_PREV.pdf, Accessed Feb. 14, 2009.

¹⁷ USGBC, *Summary of LEED Government Incentives*.

¹⁸ Board of Commissioners of Chatham County, Meeting minutes (pp. 79-85), May 12, 2006. http://www.chathamcounty.org/Chatham/uploads/Agn2006/m2006_05_12.PDF, Accessed Feb. 13, 2009.

¹⁹ City Council of Baltimore County, Maryland, Bill No. 78-07, Oct. 15, 2007, http://chapters.usgbc.org/baltimore/pdf/advocacy/Balt%20County_Commercial_b07807.pdf, Accessed Feb. 13, 2009.

At the city level, Honolulu, Hawaii has legislation offering a one-year property tax exemption for commercial building projects that earn LEED certification.²⁰ Few other cities offer LEED incentives in the form of property tax exemptions.²¹

Cincinnati tax incentive for LEED

The City of Cincinnati, Ohio has developed its own program using a property tax exemption for new LEED-certified construction. Cincinnati's LEED tax exemption program is unique because it combines a large tax break, available for a long period of time, for a relatively low level of achievement in the LEED rating system. The program includes an automatic 100% abatement of property taxes for all new construction and building renovations that are **at least certified at the LEED Certified** level through the USGBC. There is a maximum abatement amount of \$500,000 per dwelling unit, unless the Platinum level of LEED certification is reached, in which case there is no maximum amount. The program applies to both residential and commercial construction, and in this paper the focus is on commercial construction (which includes residential properties containing 4 units or more). Owners of LEED commercial construction projects who wish to participate in this program must enter into an agreement with the City of Cincinnati before construction begins. LEED-registered projects that were in-progress at the start of the program were ineligible for the abatement.

The maximum length of the exemption for new commercial construction is 15 years, and the maximum for renovations is 12 years. The owners of the project must agree to pay 25% of the amount of the tax exemption directly to the local school district

²⁰ City Council, City and County of Honolulu, Hawaii, Bill 69 (2004).
<http://www.honolulu.gov/refs/bill/text/2004/b069.htm>, Accessed Feb. 13, 2009.

²¹ USGBC, *Summary of LEED Government Incentives*.

and pay 1% of the amount of the exemption to the City as a program fee during the time of the exemption. This means that **the net real estate tax abatement is 74%** for 15 years for new commercial construction.^{22,23}

The City of Cincinnati has included the LEED tax exemption program as one of its Community Reinvestment Area (CRA) Tax Exemptions, intended to encourage rehabilitation and new construction in the City. The CRA program is part of Ohio state law which allows “municipalities or counties to designate areas where investment has been discouraged as a CRA to encourage revitalization of the existing housing stock and development of new structures.”^{24, 25} In 2002, Cincinnati City Council established the entire City as a CRA in an ordinance that provides as follows:

“Incentives are needed to curb the trend toward blight and deterioration and to encourage reinvestment in the City of Cincinnati by means of remodeling and repair of existing structures and facilities and the construction of new dwellings and commercial or industrial structure.”²⁶

Owners seeking a regular (non-LEED) commercial CRA tax abatement for their new construction or renovation in Cincinnati need to show proof of need and be approved by City Council. The process of evaluating potential participants in the regular CRA program can include gap analysis, cost-benefit analysis, and an evaluation of the number of jobs created and retained.²⁷ The LEED-CRA program offers an automatic tax exemption for LEED-certified building, so that projects do not need to be otherwise

²² City of Cincinnati, Ordinance 182-2007, May 17, 2007.

²³ City of Cincinnati, Ordinance 446-2007, Dec. 12, 2007.

²⁴ *Ohio Community Reinvestment Area Program – Summary*, Ohio Department of Development, <http://www.development.ohio.gov/cms/uploadedfiles/EDD/CRA/CRASUM2.pdf>, Accessed Dec. 6, 2008.

²⁵ Ohio Revised Code 3735.65 to 3735.70, <http://codes.ohio.gov/orc/3735.65>, Accessed Dec. 6, 2008.

²⁶ City of Cincinnati, Ordinance No. 342-2002, Oct. 23, 2002, <http://City-egov.cincinnati-oh.gov/Webtop/ws/council/public/child/Blob/10186.pdf?rpp=->, Accessed Dec. 6, 2008.
[10&m=4&w=doc_no%3D%27200205780%27](http://City-egov.cincinnati-oh.gov/Webtop/ws/council/public/child/Blob/10186.pdf?rpp=-), Accessed Dec. 6, 2008.

²⁷ Commercial Tax Abatement, Community Development, City of Cincinnati, <http://www.cincinnati-oh.gov/cdap/pages/-3481-/>, Accessed March 1, 2009.

evaluated. This automatic vs. evaluative process is the main difference between the LEED CRA program and the regular CRA program. (See end of *Appendix I* for summary table of Cincinnati CRA tax abatements).

The first barebones LEED-CRA ordinance was passed by City Council on September 29, 2006, but the effective start date of the program was **May 16, 2007**, with some revisions put in place in December 2007 (See *Appendix I* for a timeline of the LEED-CRA legislation in Cincinnati). Each of these LEED-CRA ordinances was unanimously approved by City Council. In a May 2006 motion, two City Council Members asserted that, “Through enacting visionary legislation to encourage the efficient energy use in Cincinnati, the City is taking a leadership role in being environmentally and fiscally responsible.”²⁸

Purpose of this study

The purpose of this project was to determine if Cincinnati’s LEED-CRA tax exemption program is encouraging LEED building within the City of Cincinnati and if it is promoting the use of green building practices through the LEED rating system. The Senior Development Officer for the City of Cincinnati indicated that it would be useful to know what motivates developers to pursue LEED certification,²⁹ and so a major goal of the project was to speak with developers in the Cincinnati area and find out why they choose to do or not do LEED-certified projects.

Thirteen people were surveyed using semi-structured interviews, all of whom are professionals in Cincinnati’s real estate development community. Survey respondents

²⁸ Cincinnati City Council, *Motion from Laketa Cole and Chris Bortz, May 1, 2006*.

²⁹ Personal Communication, Eric Denson, Senior Development Officer, City of Cincinnati, Dec. 10, 2008.

included participants in the LEED-CRA program, other LEED-registered project owners, and developers who do not currently have any LEED-registered projects. The respondents were asked questions regarding their perceptions of LEED building in Cincinnati and how they view the LEED-CRA program.

In order to examine whether or not the LEED-CRA program is actually affecting the trend in LEED building in Cincinnati, the number of LEED-registered projects in Cincinnati was compared to the trends in other major Ohio cities. This analysis was an indicator of the effectiveness of the LEED-CRA program as an environmentally-friendly economic development incentive, one of the major objectives of the program.

Methods: Survey of Cincinnati Developers

The survey was constructed for two main types of respondents within the Greater Cincinnati area: owners of at least one LEED-registered commercial real estate project (including LEED-CRA program participants), and developers who do not have any LEED-registered commercial real estate projects.

Selection of LEED project owners

The survey method sought to include all of the LEED-registered commercial projects in Greater Cincinnati that were commercially owned and that would be eligible to pay real estate taxes. Projects must register with the USGBC as an indication of the owner's intent to achieve LEED certification in the future. The registration process includes a two-page registration form and a flat fee (USGBC members: \$450; non-members: \$600).³⁰ The data used in this study were restricted to LEED projects that were registered before February 10, 2009 and were listed in the online USGBC database of LEED-registered projects.

Inclusion based on type of ownership and obligation to pay real estate taxes

In the USGBC Registered Projects list, each project owner is classified in one of the following categories: Federal Government, State Government, Local Government, Profit Corporation, Non-Profit Corporation, Individual, or Other.³¹ For this study, all of

³⁰ USGBC, *Project Registration*, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=65#registration>, Accessed Feb. 14, 2009.

³¹ USGBC, *Registered Project List*, Projects & Case Studies Directory, <http://www.usgbc.org/LEED/Project/RegisteredProjectList.aspx>, Accessed Feb. 14, 2009.

the Cincinnati LEED-registered projects were sorted based on the following criteria of inclusion and exclusion:

- Projects with owners of the type “Profit Corporation” were included in the study on the assumption that their building projects are usually subjected to real estate taxes.
- All projects owned by governmental entities were excluded from the study because they are potentially exempt from real estate taxes.
- Projects owned by individuals were excluded because they were all private residences and homes, and not eligible for a commercial real estate tax abatement.
- Each project owned by a non-profit was evaluated as to whether real estate taxes are collected for that property. In Cincinnati, properties owned by non-profit organizations may apply for a tax exemption if the property is being used for charitable purposes or other statutorily-defined exempt purposes. The tax status of each LEED-registered non-profit project was verified using the Hamilton County Auditor’s website.³² All of the non-profits were exempt from real estate taxes, with the exception of an American Red Cross project. That project had not yet broken ground at the time of this publication, and may be eligible for tax exemption in the future. It is being developed by a for-profit corporation that was included in the study.
- Properties in the “Other” category were further researched using the Hamilton County Auditor’s database of property information. In Cincinnati, owners in the

³²*Property Search*. Dusty Rhodes, Hamilton County Auditor, <http://www.hamiltoncountyauditor.org/realestate/rover30.asp>, Accessed Feb. 10, 2009.

“Other” category included schools, universities, and profit corporations. The projects owned by profit corporations were included in the study.

Selection of Non-LEED developers

Non-LEED developers were surveyed in order to construct a representative response of the entire population of commercial developers in Cincinnati. Developers were found through three main sources:

- List of leaders of the Cincinnati chapter of NAIOP, the Commercial Real Estate Development Association³³
- List of members of the University of Cincinnati Real Estate Roundtable³⁴
- Mention in *Cincinnati Business Courier* real estate articles³⁵

Through each of these sources, LEED developers can also be identified. To be included in this study, all non-LEED developers needed to have at least one recently-completed or in-progress project in the Greater Cincinnati area.

Defining commercial development projects in Greater Cincinnati

“Greater Cincinnati” was defined as the City of Cincinnati and its surrounding municipalities in Ohio (rather than Indiana and Kentucky, both of which border the City). Some projects included in the survey were located outside of the municipal boundaries of the City of Cincinnati, making them ineligible for the City’s LEED-CRA tax exemption.

³³ *The Cincinnati-Northern Kentucky Chapter*, NAIOP, http://www.naiop.org/CINCINNATI_NKENTUCKY/index.cfm, Accessed Feb. 10, 2009.

³⁴ *UC Real Estate Roundtable*, College of Business, University of Cincinnati, <http://www.business.uc.edu/realestate/roundtable>, Accessed Feb. 10, 2009.

³⁵ *Commercial Real Estate*, Cincinnati Business Courier, http://cincinnati.bizjournals.com/cincinnati/industries/commercial_real_estate/general, Accessed Feb. 10, 2009.

Despite ineligibility for the exemption, the owners of these projects were considered valuable to the survey given the goal of determining whether or not the LEED-CRA tax exemption is a motivating factor to build within the City limits.

This survey included commercial office, retail, and some residential projects. A distinction was made between single-family residential projects and multi-unit residential projects. Single-family residential projects were excluded from the study, as they would be part of Cincinnati's separate Residential Tax Exemption Program,³⁶ which was not a subject of this study. Multi-unit residential projects with more than four units fit into the City's Commercial Tax Abatement program³⁷ and were included in the study. The assumption underlying this distinction is that multi-unit residential projects are contributing towards the continuing economic development of the City, while single-family projects are no longer contributing to economic development after their initial sale.

Development and implementation of the survey instrument

The survey instrument was a semi-structured phone interview with a combination of open-ended, Likert scale, yes/no, and short answer questions. There were three versions of the survey, each designed for a particular type of survey respondent. The three types of respondents were: (1) participants in the LEED-CRA tax exemption program, (2) owners of LEED-registered buildings that are not in the LEED-CRA program, and (3) developers with no LEED-registered projects.

³⁶ *Residential Tax Abatement*, Community Development, City of Cincinnati, <http://www.cincinnati-oh.gov/cdap/pages/-3521-/>, Accessed Sept. 2, 2008.

³⁷ *Commercial Tax Abatement*, Community Development, City of Cincinnati, <http://www.cincinnati-oh.gov/cdap/pages/-3481-/>, Accessed Sept. 2, 2008.

The survey was reviewed and edited by two LEED Accredited Professionals who are commercial real estate attorneys in Cincinnati.³⁸ Both of these expert reviewers are in regular contact with developers in the City, and have extensive experience working on commercial development projects in the Greater Cincinnati area. The survey was also reviewed by a social science surveys expert at Duke University.³⁹

The survey covered topics relating to past experiences with the LEED rating system, perceptions of LEED, and perceptions of Cincinnati's LEED-CRA tax abatement program (See *Appendix II* for the list of questions). Respondents were allowed to comment freely during the survey, and all extraneous comments were considered critical to understanding the motivation for developers in Cincinnati to use or not use the LEED rating system.

Twenty four companies involved in real estate development in Cincinnati were initially contacted for the survey. Fifteen of those were owners of LEED-registered projects, and nine were commercial real estate developers for whom there was not readily discoverable evidence of LEED-registered projects. At each of the selected corporations, a potential survey respondent individual was identified, with the goal of surveying a person who would be able to share knowledge about the thought processes of selecting and refining development projects at their firm. This was generally either a President/CEO or a Director of Real Estate Development.

Survey respondents were first contacted by email with a brief description of the survey and a request to schedule the phone interview. All respondents were surveyed over the phone, except for one respondent who completed a written copy of the survey.

³⁸ Daniel Reitz and Richard LaJeunesse, Graydon Head, LLP, <http://www.graydon.com>.

³⁹ Dr. Randall Kramer, Nicholas School of the Environment, Duke University.

Methods: Comparing the number of LEED projects in Ohio cities

As a measure of how much the Cincinnati LEED-CRA tax abatement has affected the volume of commercial green building in Cincinnati, trends were compared over time in the number of LEED-registered projects in Columbus, Cleveland, Akron, Toledo, and Dayton from 2003 to 2008. Information about the number of LEED-registered projects was obtained from the USGBC website in January 2009 from its database of projects. While LEED registration is mandatory for all LEED project owners, inclusion in this database is voluntary. Most registered projects in this database are labeled as being owned by the federal government, local governments, schools, individuals, non-profit corporations, and profit corporations. This distinction was used to separate private projects from public projects in the analysis.

The number of LEED projects registered each quarter-year until the end of 2008 was compared among the three largest Ohio cities, Columbus, Cleveland, and Cincinnati, using the statistical environment R.⁴⁰ The number of LEED-registered projects was modeled in a negative binomial generalized linear model, controlling for several variables that could have influenced the trend in LEED building in each city. These variables were (1) eligibility in the LEED-CRA program, which included private projects registered after May 2007, (2) the passage of time, (3) the difference between the three cities, (4) the difference between the number of private and public projects, and (5) the number of residential units authorized by building permits in each city.⁴¹ The fifth variable is an indicator of overall development in the cities. The U.S. Census conducts a monthly

⁴⁰ R Development Core Team (2008), R: A language and environment for statistical computing, R Foundation for Statistical Computing, Vienna, Austria, ISBN 3-900051-07-0, <http://www.R-project.org>

⁴¹ HUD USER, Policy Development and Research Information Service, U.S. Department of Housing and Urban Development, <http://socds.huduser.org/permits/output.odt>, Accessed March 1, 2009.

survey of the number of residential units authorized by building permits in many metropolitan areas. Monthly data regarding commercial building permits are no longer being collected by the U.S. Census Bureau, and so historical data are only available until 1995, well before there were any LEED-registered projects in these Ohio cities. The data regarding residential units were used in this study as an overall indicator of development, but these data can be influenced by large multi-unit residential building projects.

The actual number of building permits authorized yearly in Cincinnati was obtained from the Building and Inspections Division of the City of Cincinnati, and compared to the yearly trend in LEED-registered projects in Cincinnati. Building permits were considered analogous to LEED-registration in the study, since both are issued when a project has reached the ‘intend to build’ stage.

Results and Discussion: Survey of Developers

Of the fifteen LEED project owners initially contacted, eight were surveyed. Six of the respondents worked for real estate development firms, one for a design firm and one for a marketing firm. Of the nine “non-LEED” developers contacted, five were surveyed. Upon contact with these five respondents, it was discovered that two of them had LEED projects either active or on hold. A 2007 NAIOP survey of developers regarding local government incentives for green development also reached very few non-green building developers, with only 3% of respondents indicating that they had no green building projects underway or planned.⁴² This may be due to the fact that they surveyed developers who had previously responded to a green building survey, or because their sample was skewed towards west coast developers.

Responses to the present survey were classified and analyzed based on the self-identifying feedback from the oral survey, rather than on the initial label of LEED or non-LEED given to each respondent. Thus, for the purpose of analysis, the following is a summary of the respondents:

- **Four respondents were LEED project owners and participants in the LEED CRA program.** This includes one developer who had initially been identified as non-LEED, but has a LEED-CRA project on hold.
- **Six respondents were LEED project owners,** but are not currently participating in the LEED-CRA program.

⁴² Yudelso Associates, *Green Building Incentives That Work: A Look at How Local Governments Are Incentivizing Green Development*, NAIOP Research Foundation, November 2007, <http://www.naiop.org/foundation/greenincentives.pdf>, Accessed Feb. 14, 2009.

- **Three respondents did not have current LEED-registered projects.**

Of these three non-LEED developers, only one developer had no current involvement in LEED. The other two non-LEED developers indicated that they have considered using the LEED rating system, and both have a least one LEED AP on their staff.

Overall, the respondents were involved in building a total of twenty LEED projects, fourteen of which are within the City of Cincinnati municipal boundaries. Eight of the respondents had LEED Accredited Professionals on staff in their company, and six of the respondents are members of the USGBC.

Reasons why LEED Building can be attractive

The LEED project owners were asked about their reasons for choosing to build LEED-registered projects. There were several trends in the response to this question and in the additional comments given by respondents. Marketing value, financial savings, and altruism were found to be the three main reasons why LEED building projects are started.

Marketing value

Six of the LEED respondents indicated that the marketing value for attracting tenants was at least part of their primary reason for first deciding to pursue LEED certification, and all of the non-LEED developers indicated that marketing would be a primary reason for doing a LEED project if they did pursue this type of construction. One LEED developer said, “All things being equal, if [LEED] is the one thing that you

have in addition to what your competition has, you win every time. It's almost like you have another card in your deck." This support of the marketing benefits of LEED differed from that found in the 2007 NAIOP survey of developers, in which none of the developers indicated that marketing was considered the most compelling reason to build green.

Research into the websites and public promotional materials of the respondents indicated that several of the firms of the LEED respondents were branding or re-branding themselves as green building professionals. Many promoted their green building projects, practices, or expertise in a separate "Green Building" section of their website. It is important to note that the LEED project owners who were contacted all had their LEED-registered projects displayed in the USGBC online database of registered projects. When owners register a project with the USGBC, there is an option to keep their registration private, so that it does not show up in the online database. These unpublished LEED projects were not targeted in this study, and are probably less likely to have chosen to build with LEED for the marketing benefits, since the owner opted to not allow information about the project to be publicly available.

Financial savings

The financial savings from operations and maintenance or from the LEED-CRA tax exemption were also considered important, and four of the LEED respondents cited this as a primary reason for choosing to begin LEED building. Interestingly, only two of the four LEED-CRA program participants indicated that the tax abatement was a primary reason for initially building a LEED project. Financial savings from operations and

maintenance or government incentives can allow LEED to be considered as part of smart financial decision-making at a company (see “Green building as part of sound business practices” below).

Altruism

Several of the LEED respondents indicated that they are building LEED-certified projects for reasons beyond the pecuniary interests of their companies. This may be linked to the values of the individual who was surveyed, or could also be a result of the re-branding of LEED companies to include a focus on green building as part of company culture. “We’re builders. We’re supposed to be building better,” said one LEED developer. One developer spoke of a sense of responsibility to the larger community, and said, along with another LEED-CRA program participant, that “it’s the right thing to do.” The three LEED respondents who spoke of this altruism indicated that these value-based altruistic factors were important in combination with other factors, such as financial savings, demand from tenants, and marketing value.

Green building as part of sound business practices

Almost all of the respondents indicated that they incorporate green building practices into their projects that are not LEED-registered. When asked if they incorporated green building practices into their projects before using the LEED rating system, one LEED developer commented that they used “some consciously and some not consciously.” Another LEED developer indicated that they had been using green building practices “unbeknownst to us... we chose a number of different construction

methods because they would save money in the long run, but it didn't have anything to do with LEED... we were just doing these out of what we thought was providing a quality building and end product for our customers.”

This may indicate that the initial switch from building conventional projects to building LEED projects was not as drastic as the developers may have anticipated. Many were choosing building practices through good business decisions, without specifically excluding green building. Two of the non-LEED developers did not currently use green building practices, although all of them said that they plan to or might plan to use LEED in the future.

Hurdles to pursuing LEED certification

Extra initial costs

Respondents were asked to rank what they believe are the three biggest hurdles to choosing to do a LEED-registered project. Most of the respondents, both LEED and non-LEED owners, indicated extra initial costs as one of the biggest hurdles (Table 2). Difficulty meeting USGBC LEED checklist requirements and a lack of knowledgeable contractors were also cited as significant hurdles. The 2007 NAIOP survey found similar results: 41% of developers believed that perceived cost increase was the most significant barrier to the growth of green buildings.

Most respondents indicated that their actual project costs increase between 3% and 5% when they undertake a LEED project. The initial cost of building LEED may not necessarily translate into an ability to sell or lease a property at a higher price. One LEED developer said that he cannot currently charge more for a space that is LEED

certified, but that it allows for a quicker sale or lease. He said that he expects that a LEED-certified property will be worth more in the future. Another LEED respondent reported saving money on a LEED-registered project by pursuing LEED Platinum certification, for which the USGBC registration fees are reimbursed upon achievement of that level.

Table 2. Developers and project owners ranked their top three hurdles to choosing to do a LEED-certified project. Responses are listed below as the number of respondents who chose each hurdle as the #1, #2, and #3 biggest hurdle to choosing to do a LEED-certified project.

<i>Hurdles to LEED</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Extra initial costs	7	4	0
Difficulty meeting U.S. Green Building Council LEED checklist requirements	2	1	2
Lack of knowledgeable green-building contractors or sub-contractors	1	3	0
Elongation of the project timeline	1	2	2
Lack of knowledgeable green-building design professionals (includes architects and engineers)	1	0	2
Lack of suppliers of appropriate construction materials	0	0	1
Other: Extra time needed to educate self and fill out applications	0	0	1
Other: Concern about whether or not clients of building projects are willing to pay extra	0	0	1
Concern about finding interested tenants	0	0	0

Steep learning curve

Some respondents perceived a steep learning curve in using the LEED rating system. Both LEED and non-LEED developers discussed education, experience, and investment of time as necessary to become comfortable with the process of building LEED-certified projects. The 2007 NAIOP survey found that 18% of developers thought that lack of knowledge of how to build green was the most significant barrier to using green building practices. In the ranked question about hurdles in the present survey, the lack of knowledge was divided into two categories regarding contractors and design professionals (see Table 2). Two respondents chose the potential lack of knowledgeable contractors or design professionals as the biggest hurdle to choosing to build a LEED

project. Another respondent added that the extra time needed to educate his own firm was also a major hurdle.

A significant challenge of going through the LEED certification process is learning to navigate the USGBC LEED checklist requirements. In regard to the difficulty of meeting USGBC requirements, one respondent said “It’s an agonizing process. I’m not in a big hurry. For me it’s an avocation, a hobby. I guess that’s good but not everybody has the same attitude as I do.”

The learning curve associated with beginning to build LEED projects is inextricably linked to extra costs and the need for knowledgeable personnel. Hiring LEED-conversant consultants helped one developer to navigate the process of pursuing his first LEED-certification project. More of another LEED developer’s projects could have been certified, he said, but “we just didn’t spend the money to hire a consultant and go through the scoring process and the sole reason of that was the extra cost associated with it.” One developer, whose first LEED project is currently on hold, said that he would want to collaborate with someone who is familiar with LEED while going through the process of filling out the paperwork to become LEED certified. “I would be afraid to do it myself; I would want somebody to make sure it was documented appropriately and hold my hand in that process.”

One LEED-CRA participant seemed to have overcome the steep learning curve, saying “I’m not worried about any of those [hurdles other than cost], we always use an integrated team from day one: We have LEED APs on staff... we know the subcontractors to go to— that was a concern a couple of years ago, but not any more—, we know the... suppliers to use so that’s not an issue.” He also said that these issues

were more prevalent when his company first started to build LEED projects, partially because there were fewer suppliers or other professionals with which he collaborated. Thus the learning curve may not be just within each company, but there may also be a learning curve that the entire real estate development sector is overcoming. One non-LEED developer alluded to this broader learning curve in terms of geographic differences. He said that he thinks it is easier to build LEED buildings in California, because “their contractors are more used to it” as compared to contractors in Ohio.

Skepticism of LEED

A major hurdle to the growth in the number of LEED-certified projects is also skepticism toward the LEED certification system. One LEED developer said that he thinks LEED certification can be more for marketing and awareness than anything else. He indicated that the LEED certification system is mostly just a way for the USGBC to earn money, and that the program itself may not be otherwise very effective. A LEED-CRA program participant said that the EnergyStar building rating system may be a better program for green development, especially for projects with existing buildings. He said that EnergyStar is “more the operational side of things, where LEED is really just in the initial construction elements.”

A non-LEED developer has determined that LEED-certification will not give him a competitive edge: “When you take a look at all of this, we can build this green stuff and it increases my cost but it doesn’t necessarily increase what I can receive in rent because I’m competing in a very competitive marketplace with buildings that are not green or aren’t made to today’s LEED standard.” This skepticism towards LEED may not be

greatly slowing the increase in the LEED building movement, given that several of the critical comments came from developers already involved in the LEED process.

Use of Cincinnati's LEED-CRA program

Only one respondent, a LEED developer whose company does projects nationwide, had not heard of the LEED-CRA program in Cincinnati. Upon learning about the program, this respondent indicated that it might be a motivating factor to build within the City limits, and he may consider utilizing the tax abatement in the future. Two other respondents, non-LEED developers, had heard of the program, but were only vaguely aware of the details. The remaining respondents indicated that they had knowledge of the program and felt comfortable giving comments on it.

Ineligibility

Discussion with developers who were not participants in the LEED-CRA program, revealed several reasons why developers had not been eligible thus far to participate in the program:

- Projects are outside of the City of Cincinnati limits. Many developers in the Greater Cincinnati area build projects both within the City limits, and in neighboring cities or townships. Some of the cities, such as Norwood and Fairfax are surrounded by or adjacent to the City of Cincinnati, but are not within its jurisdiction. One LEED developer discussed a project in the adjacent City of Fairfax: "...If we could build this to LEED standards and get the tax abatement, we would, but we don't know if it's offered within the City of Fairfax." The

interplay of development along the boundaries of the City of Cincinnati is one of the reasons why the LEED-CRA program exists as an economic development incentive. The program is intended to draw development into the City, although further issues relating to development in Cincinnati are discussed below (See “Reluctance to work with the City of Cincinnati”).

- Other financing obtained. One respondent indicated that he had a project that would not have been eligible for the LEED-CRA program because it was already receiving Tax Increment Financing (TIF), another economic development incentive. No other developer had talked about TIF or other incentives in the context of being ineligible for the LEED-CRA program, although many had used TIF or regular CRA abatements on past projects.
- Adverse economic conditions have halted some projects that were initially planned to be included in the program. Two LEED developers had specific projects with which they intended to participate in the LEED-CRA program, but those projects are currently on hold. While the tax abatement can help lessen the financial investment needed to build a LEED project, it is currently difficult to get financing in general. One LEED-CRA participant said “It took us forever to get this loan because the banks are so whacked out that it’s just a mess; they didn’t understand LEED, they didn’t understand tax abatements, so we had to wrestle with them on all those kinds of things.”

Issues of ownership and transfer of benefits

An issue that often came up during the interviews was that of who makes the initial investment in LEED and who gets the benefit. This was applicable to LEED in general, and to the use of the LEED-CRA tax abatement program. Some LEED developers were reluctant to go through the process of entering into the program because they planned to sell the building once it was completed. Thus a real estate tax abatement would not provide future financial benefits once the building was no longer under their ownership. The tax abatement *is* transferable to new owners as long as the City is notified of the transfer of ownership.

This issue also came up from respondents who lease their office space. Two of the LEED project owners were tenants in a larger building, and their LEED project was a renovation of the interior of their office space. Since they did not own the building in which the LEED project took place, the real estate tax abatement was not an incentive. The LEED-CRA program *can* be applied to LEED Commercial Interior projects, and could allow the entire building to receive the abatement.

Historical reluctance to work with the City of Cincinnati

Although almost all of the developers had used other types of economic development incentives, there were several who spoke of an aversion within the development community to doing projects within the City of Cincinnati. A LEED developer said, “I can’t tell you how many [developers]...said ‘I will never do another project within the City limits’ because dealing with the bureaucracy of the elected City of Cincinnati officials is ridiculous.” This attitude may be one of the things that the

simplicity of the LEED-CRA tax abatement was attempting to overcome⁴³, but could be a reason why there have not been more participants in the program.

Those who were familiar with the LEED-CRA program did not group it with the bureaucracy that is typically associated with the City. One LEED developer spoke of the attraction of an automatic tax exemption: “If you obtain LEED certification, you automatically get your abatement. That to me was the most comforting words that I have heard out of a City official in many, many years.” A current participant in the LEED-CRA program seemed to have an overall positive impression of his interaction with the City: “The City of Cincinnati had a young man assigned to LEED... he was very supportive in the process.”

Motivating factor to build within the Cincinnati city limits

Almost all of the respondents, whether LEED or non-LEED, have used other types of economic development incentives than the LEED-CRA abatement, most of which offer financial benefits to building in the urban core. All of the respondents who knew about the program indicated that Cincinnati’s LEED-CRA program is a motivating factor to build within the City limits. This is an important result, given that the City of Cincinnati made the LEED tax incentive part of the Community Reinvestment Area program. The developers have indicated that **the program provides motivation to build in Cincinnati over other surrounding municipalities**. Eight of the respondents plan to participate in the program in the future, including one of the non-LEED developers. The rest of the respondents were not sure if they would participate in the LEED-CRA program in the future. Reasons for not being sure about future participation

⁴³ Personal Communication, Chris Bortz, City Councilmember, Cincinnati City Council, March 16, 2009.

included lack of knowledge about the program and being a build-to-suit developer which means they are unsure of where clients may bring them in the future.

Reasons LEED-CRA participants entered into program

Of the LEED project owners surveyed, three currently have a project that is part of the LEED-CRA program. These were the only participants in the program as of February 2009. Two other respondents had planned to participate in the program, but the targeted projects are on hold indefinitely. Of the three current program participants, two are hoping to achieve the LEED Certified level and one recently received LEED Silver certification. Two of the program participants had LEED-registered projects before entering into the LEED-CRA program. The one participant who had no previous LEED projects indicated that he would not have built a project as LEED if there had not been such a substantial tax abatement available.

All of the respondents ranked the LEED-CRA tax abatement as the most important reason for pursuing LEED certification on this project, above marketing value for attracting tenants, financial savings from operation and maintenance, and environmental benefits. One respondent said that the tax abatement was number one, but did not want to discount the other reasons to use LEED: “It’s tough to rank those... [when you build] in the City of Cincinnati and [are] able to get the CRA, I would have to rank that as number one because that’s such a big number... [those are] really the four reasons you do it, they’re all four equally important.” Another respondent made it clear that the tax abatement was the only reason that his project was build as LEED: “I’d like to tell you it’s because we really want to contribute to a greener society but the truth of

the matter is there's a 75% real estate tax abatement for 15 years. That's certainly a driving force."

That same respondent said that economically, it would not have worked to build this project as LEED without the tax incentive. While the other respondents said that they would have built their projects as LEED without the incentive, one of the respondents has a second project that is currently going through the process of entering the LEED-CRA program. This project does not have an outside client requesting LEED, and would not have been built LEED without the LEED-CRA program. These results indicate that **the program can be a motivating factor to build LEED on a project that would not otherwise have been considered for LEED certification.** This is not universally true, since some developers have already made an across-the-board commitment to doing LEED projects in the future. It can be a motivating factor for projects that may be on the fence about building LEED, especially in the current economic situation, when developers have indicated that building in general has slowed or nearly halted.

Developer praise and critique of the LEED-CRA program

Each developer, both LEED and non-LEED, was given the opportunity to comment on Cincinnati's LEED-CRA program, and offer criticisms of or suggestions for improvements. The responses were mostly positive, with one program participant calling the City "visionary in their approach and a little pioneering." Another LEED developer commented: "Typically in Cincinnati, everything happens everywhere else in the nation

before it happens in Cincinnati, so it is different that they would be on the forefront like this. That's very promising."

The program participants had no complaints about the process of entering into an agreement with the City, and LEED developers found the program appealing. One participant called the program a win-win deal: "The developer wins because he gets a better tax rate in the City and the people living in the City get a better project. Right now it's just really a hell of a deal. It's very much a balance."

Another participant identified marketing as the biggest downfall of the program right now. He thought that many developers do not take advantage of the program because they do not understand it. This was confirmed by my interviews with developers who were not participating in the program. The non-LEED developers did not have any criticisms of the program, although all seemed to have only cursory knowledge about the specifics of the program.

Two of the LEED respondents, who were not program participants, were concerned that although the program is appealing today, future changes may decrease the incentive. This seemed to be based on past experiences with changes in Cincinnati's economic incentives or fear that the LEED requirements will increase. Both of these respondents hoped that the LEED-CRA program would remain the same. One of the program participants spoke on the opposite side of this issue. He was clearly less fearful of changes, saying, "I think as time goes on they'll probably phase it out and people will continue because it's the right thing to do and that extra charge to do it will have eventually gone away."

Developer suggestions for future incentives

Each respondent was asked if they had any suggestion about future incentives for environmentally-friendly development. One respondent had no suggestions, saying, “tax abatements are easy for people to get their hands around, everything else gets cumbersome.” A respondent who was not a LEED-CRA program participant said that he had liked a user-friendly online application that is used for the electric company’s incentive program.

There was a suggestion that the EnergyStar rating system might be preferred to the LEED rating system. The respondent indicated that a program using EnergyStar would have more longevity because EnergyStar takes into consideration the ongoing operational side of building development, and not just the initial construction elements that are the focus of LEED. EnergyStar is part of the LEED Existing Buildings program, according to one LEED project owner.

Another suggestion was to provide an incentive that could be offered up-front, rather than one that goes to the end-buyer. An incentive based on property taxes does not appeal to firms that are doing LEED CI renovation in a building that they lease. This was a consideration for several of the owners of LEED-projects, who had not participated in the LEED-CRA program because they had a Commercial Interiors project and were not paying property taxes on their space.

A respondent, who was not a developer, said that in order to truly increase the volume of green building, it would be better to use mandates or policies that would make it harder to build projects that are *not* LEED certified, rather than only having incentives that offer rewards for green building. He suggested a green building fee that is similar to

building permit fees, such as the one used in Arlington, Virginia. This fee could be used to fund other programs, incentives, or grants related to green building, and the fee would be reimbursed upon LEED certification.

Perspectives on green building in the current economic situation

Each respondent was asked how the current economic situation would affect the choice to use green building practices in the future. There was a wide range of responses ranging from confidence in green building as the future of commercial real estate development, to hesitation about being able to put in the initial investment to start building green.

One respondent thought that his firm's success during the economic downturn could be attributed to their focus on green building. He said that "the companies that have recognized green building as a benefit to their company are also the companies that are doing well now. Or at least doing okay right now." Other respondents who are currently involved in green building agreed that the economic situation will not change their current green building practices. "I don't think [the current economic situation] is going to affect us. We know it's the right thing to do," said one of the LEED-CRA program participants.

The LEED-CRA program may be essential to the continued promotion of green building in Cincinnati, since one respondent said that "you couldn't build a project in today's economic environment, period, without subsidy." This was clear, as several projects were encountered that were on hold indefinitely because of an inability to find financing for projects. The LEED developer who had not previously heard of the LEED-

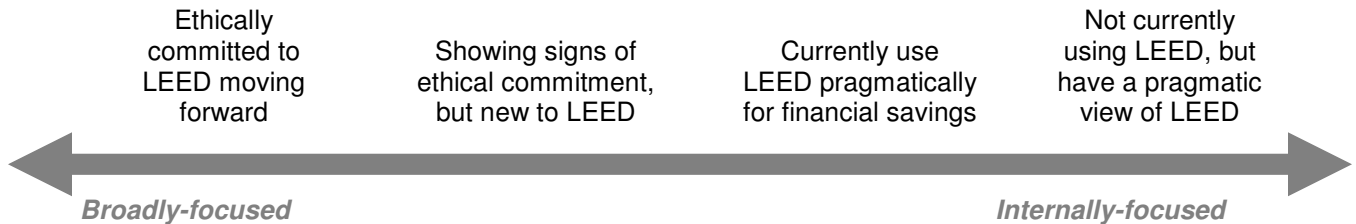
CRA program said that his firm will need to “continue to utilize the ‘low hanging fruit – low cost – instant return’ approach.” Without a program like the LEED-CRA tax abatement, green building projects are likely to be seen as a higher fruit on the tree, with returns that stretch further in the future and may not be as feasible in the current economic environment.

All of the non-LEED developers indicated that the upfront costs of pursuing a LEED project made LEED less attractive during the current economic situation. “Because right now there is such a retraction and recalibration of everything,” said a non-LEED developer, “if green strategy raises costs, that’s going to be a problem.” All of the non-LEED developers felt a need to consider the more short-term impacts of that investment, even if they believed that LEED building will continue growing in the future. “I think that ultimately LEED is definitely going to be the way of the future... but in the short term... I think the momentum might be slowed a little bit because of the current economy.” While the LEED-CRA tax abatement can mitigate some of the long-term costs from a LEED project, it will not help with the upfront financing that has been difficult for developers to obtain in late 2008 and early 2009.

Classification of approaches to LEED

After speaking with the developer and LEED project owner respondents personally, it became clear that there were great differences in the attitudes, perceptions, and knowledge of developers regarding LEED in the Greater Cincinnati area. Since all of the developers had at least some knowledge of LEED, had considered using LEED on projects, or had LEED APs on staff, there were no developers who were entirely ignorant

of the LEED rating system. It appeared that all of them were likely to be pursuing or considering a LEED project at sometime in the future. A spectrum of approaches was perceived to the LEED rating system, which is shown below:



Some LEED respondents were ethically committed to LEED as a strategy for increasing business and surviving the poor economy. These types of developers said that they offer the option of building LEED projects to all of their clients, and some have made a commitment use LEED on all of their developer-initiated projects in the future. They were also more likely to cite altruistic reasons for pursuing LEED certification. Two of the current LEED-CRA program participants were in this category. Another group of respondents was moving towards this ethical commitment, but was still building or developing their first LEED projects. These developers were in the nascent stages of building LEED projects, but showed a commitment that went beyond financial savings or tenant demand. This group of ethically-committed LEED developers is likely to participate in the LEED-CRA program, but it may be more of “icing on the cake,” as one of the respondents said.

The other major group of respondents viewed LEED as more of a pragmatic business decision, usually as a tactic for financial savings. One of the current LEED-CRA program participants was in this category, since he chose to do a LEED project in order to receive the tax abatement. Most of the non-LEED developers are likely to use

LEED pragmatically in the future, as there is more tenant demand, and as initial costs come down. It is this group of pragmatic LEED developers that is likely to be most influenced by the LEED-CRA program or other similar economic incentives for green building.

Results and Discussion: Comparison to LEED building in major Ohio cities

Trends in LEED building were compared among the five largest cities in Ohio. Of these five, the three largest, Columbus, Cleveland, and Cincinnati, all had more than twenty-five LEED-registered projects, of which twelve or more were privately owned as of January 2009 (Table 3).

Table 3. City size⁴⁴ and number of LEED-registered projects⁴⁵ in Ohio's largest cities

City	Population, (2006)	Area, sq. miles	Total # of LEED- registered projects	Number of privately owned LEED- registered projects
Columbus	733,203	210	39	12
Cleveland	444,313	77	51	14
Cincinnati	332,252	77	67	29
Akron	209,704	62	18	4
Toledo	298,446	80	9	1
Dayton	156,771	55	22	3

An initial look at the trends between the cities shows a large spike in the number of new LEED-registered projects in Cincinnati in the latter half of 2008 (Figure 1). While the number of LEED-registered projects spiked in Cincinnati, the number of projects in Cleveland and Columbus either stayed the same or decreased. Cincinnati has an ordinance that all new *public* buildings be built as LEED registered, and public projects do account for many of the new LEED projects in that city. The spike in Cincinnati LEED-registered projects, though, is still present when only looking at projects owned by profit corporations (Figure 2).

⁴⁴ *State and County QuickFacts*, U.S. Census Bureau, <http://quickfacts.census.gov/qfd/states/39000.html>, Accessed Feb. 20, 2009.

⁴⁵ USGBC, *Registered Project List*.

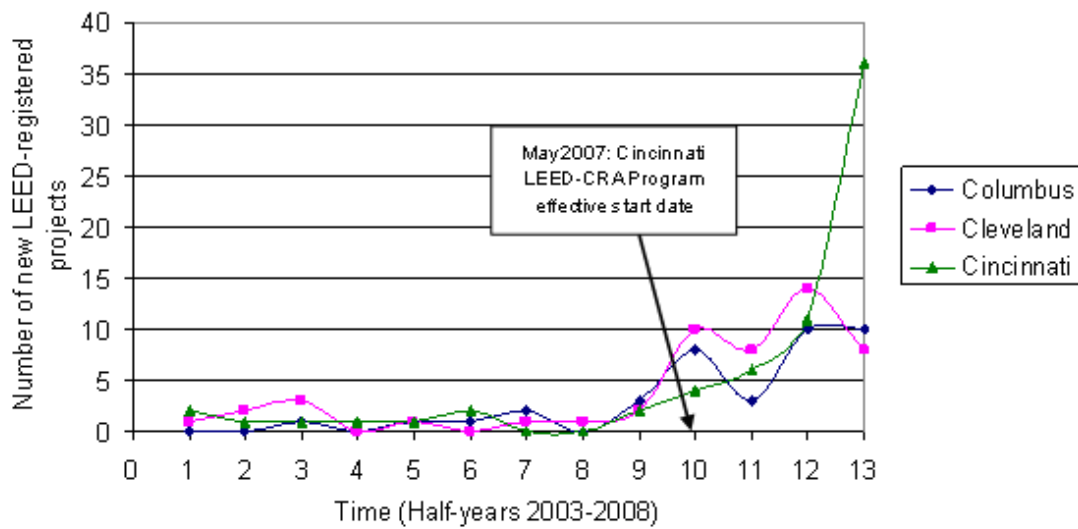


Figure 1. New LEED-registered building projects in major Ohio cities, through December 2008

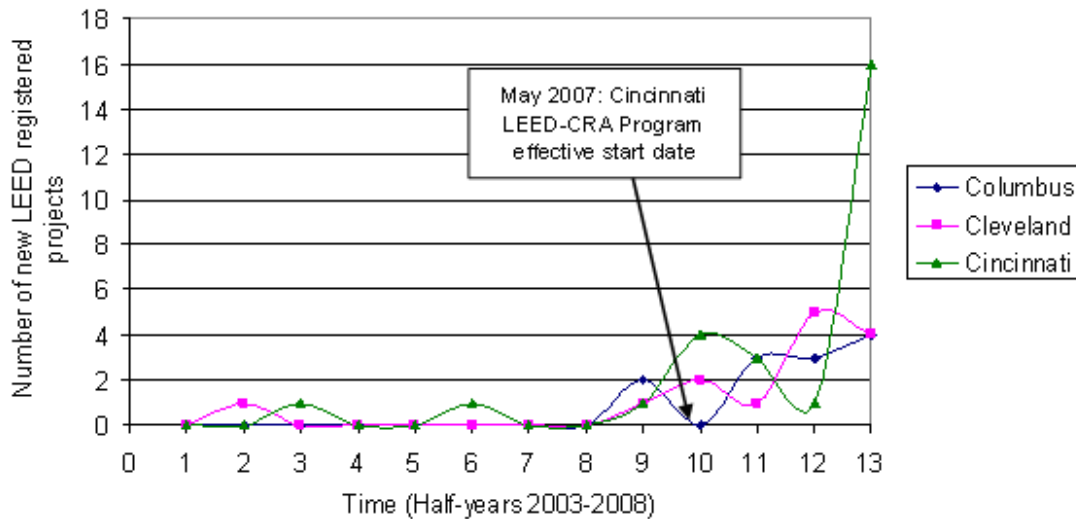


Figure 2. New LEED-registered building projects owned by profit corporations in major Ohio cities, through December 2008

The increase in LEED-registered buildings in Cincinnati was much greater than changes in the number of building permits issued in Cincinnati over the last six years. The issuing of building permits and LEED-registration are both actions that happen when a construction project has been planned, but before the construction has begun. There is

no upward trend in building permits issued in Cincinnati between 2003 and 2008, especially compared to the upward trend in the number of LEED-registered projects in Cincinnati over the same time period (Figure 3).

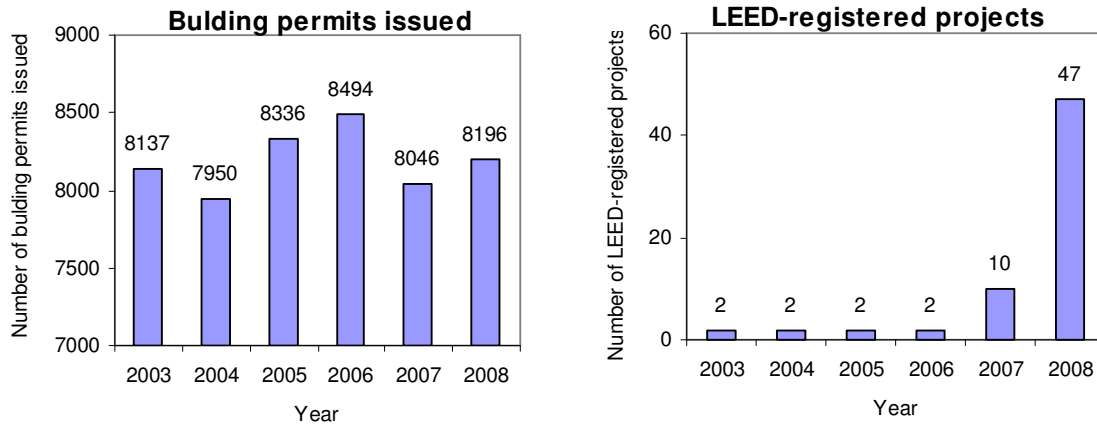


Figure 3. The number of building permits issued yearly in the City of Cincinnati and the number of projects LEED-registered in Cincinnati yearly with the USGBC since 2003. Includes public and private projects.

A Negative Binomial GLM was used to examine whether this upward trend in LEED-registered projects in Cincinnati could be attributed to the LEED-CRA tax abatement program in Cincinnati. The model controlled for changes over time, differences in city location, differences in the trend between privately owned projects and all types of owners, whether the project was eligible for the LEED-CRA program (privately owned and registered after the May 2007), and an indicator of the overall volume of building.

Eligibility for the Cincinnati LEED-CRA tax abatement program seemed to influence the number of LEED-registered building projects (*Estimate*=1.695, *p*= 0.002, Table 4). Interestingly, there was not a statistically significant estimate when the same eligibility criteria were applied to Cleveland and Columbus. This indicates that the

changes that occurred in the number of privately-owned LEED-registered projects in Cincinnati after May 2007 were not also happening at a regional level. Thus the **large increase in LEED-registered projects could likely be, at least partially, attributed to the LEED-CRA tax abatement program that was started in May 2007**, unless there is some other factor, present only in Cincinnati and affecting privately-owned projects that occurred starting in May 2007.

Two other variables had estimates that were statistically significant. First, a linear increase in the number of LEED projects over time since 2003 seemed to have influenced the trend in LEED-registered projects in that time period (*Estimate = 0.124, p = 1.280E-05*). It is not surprising that as the LEED rating system has gained popularity, there has been an increase in the number of LEED-registered project which may correspond to the spike in the number of LEED-registered projects in Cincinnati. Second, there was a statistically significant estimate for the variable indicating the number of privately-owned LEED-registered projects (*Estimate=-1.338, p=0.001*). This variable separated out the differences in the trend in privately-owned and publicly-owned LEED-registered projects. The negative estimate indicates that private projects are less likely to be LEED-registered, which is the situation that the LEED-CRA program is working to rectify. There was not a strong effect from a general increase in development, as indicated by the number of residential units authorized by building permits.

Table 4. Estimates for the Negative Binomial GLM of the number of LEED-registered projects in Cincinnati, Columbus and Cleveland, Ohio.

<i>Variables</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>p-value</i>
Quarter years from 2003-2008	0.124	0.028	1.280E-05 ***
Cincinnati location	NA	NA	NA
Columbus location	-0.200	0.646	0.757
Cleveland location	0.163	0.670	0.807
Number of private projects	-1.338	0.406	0.001 ***
Eligible for Cincinnati LEED-CRA program	1.695	0.552	0.002 **
Eligible for hypothetical Columbus LEED-CRA program	0.660	0.593	0.265
Eligible for hypothetical Cleveland LEED-CRA program	0.834	0.604	0.167
Number of residential units authorized by building permits: Cincinnati	-0.004	0.003	0.140
Number of residential units authorized by building permits: Columbus	0.000	0.001	0.553
Number of residential units authorized by building permits: Cleveland	-0.005	0.008	0.503

** $p < 0.01$, *** $p < 0.001$

Summary of Conclusions

Cincinnati's LEED-CRA tax abatement program does appear to be encouraging LEED building within the City of Cincinnati and is promoting the use of green building practices through the LEED rating system. The increase in LEED-registered projects that has occurred since 2003 is greatly influenced by the start of the LEED-CRA program in May 2007. Developers had an overall positive view of the program, and thought that it could or has motivated them to begin a development project within the City of Cincinnati. The LEED-CRA tax abatement program can make green building with the LEED certification system a more viable option, as compared to LEED certification without the tax abatement. All of the developers seemed to be moving towards increasing the number of LEED projects that they build in the future, despite facing some hurdles when beginning to use the LEED certification system. For developers who are not already involved in LEED building, a learning curve will be one of the challenges to overcome in the future.

ACKNOWLEDGEMENTS

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- The Cincinnati Regional Chapter of the USGBC, especially Alan Warner, chair, and Amy Ostigny.
- City of Cincinnati employees and elected officials, for their advice, support, and input: Eric Denson, Senior Development Officer, Amit B.Ghosh, Deputy Director of Planning and Buildings and others at the Buildings and Inspections Division, Chris Bortz, City Council Member.
- Dr. Jeffrey Vincent, for serving as both my academic advisor and my master's project advisor.
- Richard LaJeunesse for providing invaluable insight into the real estate, tax law, and green building in Cincinnati.
- Daniel Reitz for his expert review of the survey used in this project, as it pertained to real estate development and green building in Cincinnati.
- Dr. Randall Kramer for his advice regarding the social science survey structure of the project.
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- My family for their advice, support, and occasional technical assistance throughout the process.

APPENDIX I. Timeline of the LEED Community Reinvestment Area development in Cincinnati City Council

October 23, 2002 (#200205780)

Ordinance 324-2002

- Established a City-Wide Community Reinvestment Area, eligible for CRA tax abatements, pursuant to Ohio Revised Code Sections 3735.65 through 3735.70.
- “Incentives are needed to curb the trend toward blight and deterioration and to encourage reinvestment in the City of Cincinnati by means of remodeling and repair of existing structures and facilities and the construction of new dwellings and commercial or industrial structure.”

[Repealed by Ordinance No. 119-2007 passed March 28, 2007 (#20070383)]

May 1, 2006 (#200600450)

Motion from Laketa Cole and Chris Bortz (Member of Cincinnati City Council) for:

- “We move that an Ordinance be drafted that would provide an automatic tax exemption of the maximum number of years allowable by law and 100% of the assessed property value on the construction or rehabilitation of commercial properties if the property is built or rehabilitated to Leadership in Environmental & Energy Design (LEED) Certified, Silver, Gold or Platinum standards as defined by the U.S. Green Building Council.”
- “Through enacting visionary legislation to encourage the efficient energy use in Cincinnati, the City is taking a leadership role in being environmentally and fiscally responsible.” Chicago, Seattle, Portland, Austin, and Boston are cited as having municipal programs encouraging “green” principles.

May 1, 2006 (#200600451)

Motion from Laketa Cole and Chris Bortz (Members of Cincinnati City Council) for:

- “We move that any new municipal buildings in Cincinnati be constructed to LEED certification.”
- “We further move that any municipal building renovated by the City should incorporate “green” building elements in their constructing, using LEED as a benchmark when feasible.”
- “We believe that this motion will enable Cincinnati to make a positive statement about our commitment to the environment.”

September 20, 2006 (#200600871)

Ordinance No. 274-2006 passed

Amendment to Ordinance No. 342-2002

- Automatic 100% real property tax exemption for maximum years available by law for all new construction or rehabilitation of commercial property built with to at least the level of LEED Certified.
- No specifics about program implementation or guidelines are included in this ordinance.

[Repealed by Ordinance No. 182-2007 passed May 1, 2008 (#200700567)]

June 12, 2006 (# 200600599)

BUDGET POLICY MOTION from Laketa Cole (Cincinnati City Council Member and Chair of the Vibrant Neighborhoods, Environment and Public Services Committee):

- “I move that the recommendations made by the “LEED Motions,” (Motion #200600450 and # 200600451) be implemented in this biennial budget cycle.”

February 1, 2007 (#200700184)

Document from Milton Dohoney, Jr. City Manager

Re: Implementation of the LEED Ordinance #274-2006

- LEED-certified commercial or industrial projects are eligible for maximum 15-year abatement, with a net 75% exemption after a separate agreement requires that 25% be paid to the school board.
- Written agreement signed by the City Manager prior to beginning construction is required.
- The LEED section of the CRA abatement will provide a longer term of abatement and a time savings of not going through a gap analysis usually needed to obtain a CRA abatement.

March 21, 2007 (#200700334)

Document from Milton Dohoney, Jr., City Manager

Re: Updated Implementation of the LEED Ordinance #274-2006

- Since LEED certification cannot be obtained until after construction is completed, the developer will be required to either
 - Register the development with the USGBC with the intent to certify
 - Provide third-party verification that LEED requirements have been met in the final building design.

March 28, 2007 (#20070383)

Ordinance No. 119-2007

- *Repealing Ordinance No. 342-2002, passed on October 23, 2002*
- Established a City-Wide Community Reinvestment Area, eligible for CRA tax abatements, pursuant to Ohio Revised Code Sections 3735.65 through 3735.70.
- Extending the term of the Community Reinvestment Area Tax Exemption Program for another ten years and re-establishing the nature and length of the exemption from real property taxation.
- Updated and provided specific rules for the Cincinnati CRAs.

May 16, 2007 (#200700567)

Ordinance No. 182-2007

- *Repealing Ordinance No. 274-2006, passed on September 20, 2006*
- “Amending ordinance No. 119-2007 in order to provide an automatic 100% real property tax exemption, for the maximum number of years allowable by law... if the property is constructed or rehabilitated to LEED Certified, Silver, Gold, or Platinum standards.”

December 12, 2007 (#200701240)

Ordinance No. 446-2007

- “Amending Ordinance No. 182-2007 to more clearly define the eligibility requirements and the nature and length of real property tax exemptions... if the property is constructed or rehabilitated to LEED Certified, Silver, Gold or Platinum standards.”
- Maximum 15-year exemption for newly constructed industrial or commercial properties
- Maximum 12-year exemptions for remodeled industrial or commercial properties
- Providing that
 - A completed application has been submitted to the City Department of Community Development and Planning
 - Industrial or commercial properties shall require a written exemption agreement approved by ordinance of Cincinnati City Council and signed by the City manager prior to the beginning of construction.
- All other terms and conditions of Ordinance No. 182-2007 shall remain in full force and effect.
- Included the following table summarizing CRA tax abatements in Cincinnati:

**COMMUNITY REINVESTMENT AREA
LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN**

CRA Tax Abatement Program	Conditions	Percentage of Abatement on Improvements as of 10/23/07	Term of Abatement
1/2/3 Unit Residential - New Construction	Entitlement - application submitted after construction complete	100% up to \$275,000	15 Years
1/2/3 Unit Residential - Remodel	Entitlement - application submitted after construction complete	100% up to \$275,000	10 Years
Commercial/Industrial/Multi-Unit Residential (Apartments) - New Construction	Proof of Need required. Each agreement approved by City Council	Varies Depending on Need and/or job creation	Varies Depending on Need and/or job creation
Commercial/Industrial/Multi-Unit Residential (Apartments) - Remodel	Proof of Need required. Each agreement approved by City Council	Varies Depending on Need and/or job creation	Varies Depending on Need and/or job creation
LEED Certified 1/2/3 Unit Residential - New Construction	Entitlement - application submitted after construction complete including LEED Documents	100% up to: Certified, Silver or Gold - \$500,000 Platinum - No cap	15 Years
LEED Certified 1/2/3 Unit Residential -Remodel	Entitlement - application submitted after construction complete including LEED Documents	100% up to: Certified, Silver or Gold - \$500,000 Platinum - No cap	10 Years
LEED Certified Commercial/Industrial/Multi-Unit Residential (Apartments) - New Construction	No Proof of Need required. Each agreement approved by City Council	100% with requirement to execute CPS agreement	15 Years
LEED Certified Commercial/Industrial/Multi-Unit Residential (Apartments) - Remodel	No Proof of Need required. Each agreement approved by City Council	100% with requirement to execute CPS agreement	12 Years

Revised November 2007

APPENDIX II. The Survey Instrument

Each survey consisted of three sections (A, B, and C below).

The three versions of the survey were designed for:

- LEED-CRA program participants (Section A-1, Section B-1, Section C)
 - Other LEED developers (Section A-1, Section B-2, Section C)
 - Non-LEED developers (Section A-2, Section B-2, Section C)
-

SECTION A-1 (For LEED-CRA Program Participants and other LEED Developers)

- 1.) How many commercial building projects did your company start in 2008?... in 2007? ... in 2006?
- 2.) How many of your current or past projects are LEED registered? Are any of these projects completed? Have they received LEED certification? At what level? In what LEED program?
- 3.) Do you have any LEED-registered projects that are outside the City of Cincinnati?
- 4.) What was your primary reason for first deciding to use the LEED certification system?
 Financial savings from operation and maintenance
 Environmental benefits
 Marketing value for attracting tenants
 Tax exemption through a LEED-CRA agreement
 Other _____
- 5.) Is that still your primary reason for using LEED today? *If no, what is your primary reason for using LEED today?*
- 6.) Before using the LEED rating system, did you incorporate green building practices into your projects? *If yes, what types of measures?*
- 7.) Do you incorporate green building practices into projects that are not LEED registered? *If yes, what types of measures?*
- 8.) Have you participated in any green building programs other than LEED? *If yes, which ones?*
- 9.) By what percentage do your project costs increase when you undertake a LEED project?

SECTION A-2 (For non-LEED Developers)

- 1.) How many commercial building projects did your company start in 2008?... in 2007? ... in 2006?
- 2.) Do you have current projects that are outside the City of Cincinnati?
- 3.) Do you have current projects that are inside of the City of Cincinnati?
- 4.) Do you incorporate green building practices into your projects? *If yes, what types of measures?*
- 5.) Are you familiar with the U.S. Green Building Council's LEED Program (Leadership in Energy and Environmental Design)? *If yes, are any of your current or past projects LEED registered? If yes, how many?*

- 62.) Have you considered using LEED certification for any of your past projects? *If yes, Why did you decided to not pursue LEED certification?*
- 7.) Do you plan to do LEED-certified projects in the future?
- 8.) Do you have current projects that are outside the City of Cincinnati?
- 9.) If you decided to begin LEED construction, which of the following would be your primary reason for building LEED?
- Financial savings from operation and maintenance
 - Environmental benefits
 - Marketing value for attracting tenants
 - Real Property Tax exemption for LEED Certification
 - Other _____
- 10.) Have you participated in any green building programs other than LEED? *If yes, which ones?*
-

SECTION B-1 (For LEED-CRA Program Participants only)

- 1.) Your company is participating in Cincinnati's Community Reinvestment Area tax exemption for LEED-certified buildings, correct?
- 2.) What level of certification are you hoping to attain for this project (or have you attained?)
- 3.) Had you built a LEED building before participating in the LEED CRA program? *If yes, which project was that?*
- 4.) Have you used other economic development incentives, such as an Enterprise Zone tax abatements or a non-LEED CRA tax abatements, for any of your projects? *If yes, on how many projects?*
- 5.) Please rank in order of importance your reasons for pursuing LEED certification on this project
 - Financial savings from operation and maintenance*
 - Environmental benefits*
 - Marketing value for attracting tenants*
 - Tax exemption through a LEED-CRA agreement*
 - Other _____*
- 6.) Did you consider building this project in any cities or suburbs other than Cincinnati? *If yes, What other cities? Was the LEED CRA tax exemption a deciding factor in choosing Cincinnati?*
- 7.) Would you have built this project as LEED if the LEED-CRA tax abatement had not been available?
- 8.) Do you plan to use the LEED-CRA tax exemption program in the future?

SECTION B-2 (For developers *not* in the LEED-CRA tax exemption program)

- 1.) If you could receive a tax abatement for LEED-certified construction, would you pursue LEED certification in more of your projects?
- 2.) Are you familiar with Cincinnati's Community Reinvestment Area tax exemption for LEED-certified buildings?

If yes- Do you plan to participate in this program in the future? What is your primary reason for not having participated in the program?

If no- Through the LEED-CRA program, an owner can enter into an agreement with the City which offers a real property tax abatement to LEED-certified construction projects in the City of Cincinnati. After making a separate agreement with the school district, the abatement can amount to 74% of real property taxes being abated for 12-15 years, depending on the type of project. Would you consider participating in this program in the future? *If no, why not?*

- 3.) Have you used other economic development incentives, such as an enterprise zone tax abatements or a non-LEED CRA tax abatements, for any of your projects?
If yes, on how many projects?
 - 4.) Do you think that Cincinnati's LEED tax-abatement program is a motivating factor to build within the City limits? *If no, why not?*
-

SECTION C (For all respondents)

- 1.) What do you think are the 3 biggest hurdles to choosing to do a LEED-certified project? I will read a list of answers and you can rank the top three in order, with 1 being the biggest hurdle.
___ Extra initial costs
___ Concern about finding interested tenants
___ Lack of knowledgeable green-building contractors or sub-contractors
___ Lack of knowledgeable green-building design professionals
___ Elongation of the project timeline
___ Lack of suppliers of appropriate construction materials
___ Difficulty meeting U.S. Green Building Council LEED checklist requirements
___ Other _____
 - 2.) Do you have any LEED Accredited Professionals do you have on your staff? *If yes, how many?*
 - 3.) Is your company a member of the US Green Building Council? *If yes, when did you join? Are you also a member of the Cincinnati Regional Chapter?*
 - 4.) Do you have any general comments for improvements or criticisms of Cincinnati's LEED-CRA program?
 - 5.) Do you have any suggestions about future incentives for environmentally-friendly development?
 - 6.) How do you think the current economic situation will affect your choice to use green building practices in the future?
-