

# **LIPA's Commercial Construction Incentives for Green Buildings**

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## **ABSTRACT**

Initiated in 2000, LIPA's Commercial Construction Program (CCP) is available to all commercial and industrial customers in LIPA's service territory. The program offers technical and financial incentives to building owners and developers for the design and construction of high performance energy efficient commercial buildings. Customers may participate at the basic Prescriptive level, whereby rebates are available for known energy savings technologies, or more comprehensively at the whole building level. As a market transformation program, with the objective of changing the behaviors of the marketplace players, LIPA staff work directly with customers and their architects, engineers and other professionals responsible for building construction. Participation in the whole building approach has been limited, as the general rule for eligibility is for the building to be at least 50,000 square feet, and the process does require additional effort as well as a cost sharing component for the required energy modeling.

In an effort to further promote whole building approach to design, and to address the growing green building movement as documented by the US Green Building Council, LIPA formally adopted additional Green Building incentives to the CCP. The structure of these additional incentives will be detailed in the paper and presentation. The paper and presentation will examine other Green Building incentive programs around the country and provide a comparison of the benefits, and deficiencies, of each. Particular emphasis will be placed on the LIPA incentive structure and how it addresses key barriers (perceived or real) towards the design and construction of Green Buildings.

Since formally adopting the Green Building incentives, there has been a marked increase in participation in the whole building approach. While many market transformation programs attempt to impart their goals upon the marketplace in an attempt to enact change, LIPA's Green Building incentives capitalize on a growing but underutilized market trend, LEED Green Buildings. The paper will examine the differences in these approaches focusing on the successful partnership between LIPA's CCP and these Green Buildings. Additionally, it will be shown that the relationship between LIPA and the design community, a group of professionals sought after for market transformation, has improved through the introduction of these incentives.

## **THE GREEN BUILDING MARKET**

The definition of what constitutes a green building has been posed for years. A variety of interpretations could be found depending on one's own educational background, personal beliefs, or professional affiliation. Characteristics that were considered "green" by some were argued to have harmful environmental impacts by others. For years buildings have exhibited many characteristics of what has become synonymous with today's green movement. Passive solar design has its roots in ancient architecture and saw a renewed emphasis during the energy crisis of the 1970's. The use of naturally renewable or recycled materials is not new. A consistent definition of green was needed.

Green building is the practice of increasing the efficiency and performance of buildings and minimizing their use of energy, water, and materials, thereby reducing a building's impacts on human

health and the environment, through better siting, design, construction, operation, maintenance, and ultimately the removal — the complete building life cycle.<sup>1</sup>

Until 1993 when the U.S. Green Building Council (USGBC) was formed, there was no consensus on what the components of a green building were. As the nation's leading nonprofit organization focused on sustainable building practices, the USGBC is composed of corporations, builders, universities, government agencies, and other nonprofit organizations working together to promote buildings that are environmentally responsible, profitable and healthy places to live and work. The USGBC is known for its development of a broad portfolio of programs known as LEED, Leadership in Energy and Environmental Design, and the USGBC organizes the industry's popular Greenbuild International Conference and Expo. The USGBC's LEED rating system is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings, although there are other programs with similar goals. As such, LIPA has used the LEED rating system as a guide for the design of a green building program. Many countries have developed their own standards of energy efficiency for buildings including Canada and the United Kingdom. Today, the green building industry is worth upwards of \$12 billion.<sup>2</sup>

## **IMPACT OF BUILDINGS ON ENVIRONMENT**

Buildings account for nearly 40% of all greenhouse gas emissions through their construction, operation, and maintenance. Materials extracted from the earth, or manufactured for building products, consume vast quantities of energy and create significant waste streams. Conveying these building materials from factories, or their source, consumes fuel and produces carbon dioxide. Despite building energy codes and standards, there are a significant number of inefficient uses of energy in building operation, an issue compounded by the complexity of the construction process, which is budget and schedule driven. Pumping of water from municipal systems, although it doesn't show up on a building's utility bill, also has an impact on the overall utility infrastructure. In areas of the country where the availability of water is in question, reduction of building related water usage can have an even greater environmental impact. For an electric utility like LIPA, the reduction of peak demand and annual energy usage are of key concerns, and building energy consumption comprises a significant portion of the load. From all the research, it is clear that the built environment has a profound impact on our natural environment, economy, health, and productivity.

In the United States alone, buildings account for:

- 71% of electricity consumption,
- 36% of energy use,
- 39% of carbon dioxide emissions,
- 30% of raw materials use,
- 12% of potable water consumption.<sup>3</sup>

## **INCREASE IN AWARENESS**

One measure of the increased interest in green buildings and sustainability is seen in the growth in membership organizations like the USGBC. USGBC membership has grown significantly in the past few years. Sometime in the middle of 2007, membership in the organization exceeded 10,000. "This

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<sup>1</sup> Wikipedia.org

<sup>2</sup> USGBC

<sup>3</sup> USGBC

achievement is a significant milestone in the growth and development of the green building movement because it demonstrates a broad conviction that our built environment can improve the health of our planet, our economy, and our communities,” said Rick Fedrizzi, President, CEO and Founding Chair of the organization.<sup>4</sup>

While the number of member organizations has grown, including LIPA in 2006, individual membership has also increased at the local level. There are 70 chapters, affiliates and organizing groups across the country that provide individuals the ability to participate in the green building process. On Long Island, the chapter has seen a similar increase in membership since its inception just a few years ago. The title of LEED Accredited Professional distinguishes building professionals with the knowledge and skills to successfully steward the LEED certification process. LEED Accredited Professionals (LEED APs) demonstrate a thorough understanding of green building practices and principles and the LEED Rating System. More than 42,000 people have become LEED APs since USGBC launched the Professional Accreditation program in 2001.

The annual Greenbuild International Conference and Expo was launched in 2002 as the world's largest conference and expo dedicated to green building.<sup>5</sup> Attendance at the first conference held in Austin, TX was 4,185. The 2007 conference is expected to draw over 20,000 attendees and will feature more than 850 exhibit booths. This event provides a common forum for people to see products, meet other professionals, and share ideas about the industry.

Since the introduction of the USGBC's LEED Green Building Rating System, there have only been a handful of buildings constructed on Long Island that have sought certification although the number of registered projects is growing. According to the USGBC records, there are currently 35 certified green buildings in New York State with only one being located on Long Island.<sup>6</sup> Across NY State there are more than 400 projects registered with the USGBC seeking certification. Of these, there are 30 currently registered projects on Long Island, more than 75% of which are participants in LIPA's CCP and seeking Green Building incentives (22 projects). Comparatively, California leads the way with hundreds of registered projects and nearly 150 certified. Some of the LIPA projects are listed below:

- Stony Brook Research Center is a 36,000 square foot building that is seeking Platinum certification. The expected completion date is 2008.
- BDG Tanger Mall is an 800,000 square foot retail mall project who is working with Blumenfeld Development Group [BDG] and Tanger Malls. The customer had made a commitment to seek LEED Core and Shell certification to meet the pending local zoning requirements; legislation in the Town of Babylon will mandate that all commercial projects be green and BDG met such a commitment before the legislation became official. The expected completion date is 2008.
- Wild by Nature, a whole foods supermarket owned by King Kullen, is a 20,000 square foot building working with a LEED Accredited Professional, Peter Caradonna and working with SAIC, through LIPA, for their energy model. SEi Companies, a LIPA technical assistant, will be providing the commissioning. Expected completion date is 2008.
- Suffolk County's Fourth Police Precinct is a 36,000 square foot building who has signed on Viridian Energy and Environmental to provide their energy model and other green building assistance. The measures include lighting, envelope, HVAC and controls. Expected completion date is 2009.

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<sup>4</sup> USGBC press release, 7.5.2007, from usgbc.org

<sup>5</sup> Greenbuildexpo.com

<sup>6</sup> USGBC from usgbc.org, December 2007 and within LIPA's service territory

## **GREEN BUILDING PROGRAMS**

In order for LIPA to roll out a successful program, the Commercial Construction Team has researched other Green Building Programs and entities across the country. It was in these programs that the team was able to gain the knowledge and reach out for expertise from our fellow Utilities. Below are some of the programs LIPA referenced:

- Avista Utilities, serving Idaho and Washington, has a LEED (New Construction or Existing Building) Certification Energy Efficiency Rebate Program.<sup>7</sup> Their program deals with whole buildings and comprehensive measures. The program is available to Commercial/Industrial customers, Schools and Institutional customers. Avista Utilities' customers that achieve a minimum of 4 points for optimized energy performance and comply with all LEED whole building modeling requirements are eligible for a \$1.25 per conditioned square foot rebate through Avista's LEED (NC or EB) Certification Incentive Program. School facilities meeting the Washington Sustainable Schools Protocol (achieving at least 6 points from the energy category) may also qualify for the incentive.
- Austin Energy (Texas) has a Green Building Program which promotes better health, greater comfort, lower utility bills, less maintenance, and lasting value.<sup>8</sup> Austin Energy Green Building is the nation's most successful utility-sponsored sustainable building program. The program offers consulting, resources and education to help you build an environmentally-sound workplace. Austin Energy also offers a Green Building's™ Sourcebook which contains information relevant to the Austin area, such as regulatory issues, climate, installation guidelines, and sources of assistance. It also provides pertinent information on various aspects of sustainable building strategies and possible implementation issues that may be found in less familiar approaches to building. The Sourcebook is designed to educate and inform all readers, but is directed specifically to those with knowledge of the building trades and terminology and to motivated laypersons. Their Web site offers valuable case studies on various projects related to Green Buildings.

These two (2) Programs are just an example of the Green Building Programs that LIPA referenced to put together a successful Program. LIPA's Program has incorporated some of the same components as our Utility Partners as well as some unique procedures that work for LIPA customers. There are some Townships on Long Island, such as Town of Babylon, in which any new construction of commercial buildings over 4,000 square feet are mandated to be LEED certified Green Buildings. There are other Townships that will be incorporating these mandates as well. LIPA is making every effort to make this an easy process for those Townships as well as financially beneficial.

## **LIPA'S GREEN BUILDING INCENTIVES**

Participation in LIPA's CCP can help building owners meet the requirements of LEED Certification for Green Buildings. Whole building energy modeling, building commissioning, and financial incentives for energy efficiency, renewable energy and green power are available under this program.

LIPA examined the existing CCP and reviewed the overlap with green building requirements. Through interviews with membership of the fledgling Long Island Chapter of the USGBC, LIPA was able to identify potential barriers to green building approach. Much of LIPA's CCP already existed in

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<sup>7</sup> [goodtobegreen.com](http://goodtobegreen.com)

<sup>8</sup> [austinenergy.com](http://austinenergy.com)

such a manner to address several of the concerns including the required energy modeling. However, building commissioning was not required by LIPA's CCP, it had only been implemented on a handful of projects. And there were costs associated with registering, filing, and certifying the project through the USGBC. Each of these potential barriers would need to be addressed in some fashion in order for the program to be successful.

Defined by LEED, the components of Green Buildings extend beyond the energy consumption and include sustainable sites, water efficiency, green materials and the indoor environment. LIPA's CCP had already been designed to meet energy savings goals and promote efficiency, but had no clear connection to the goals of a green building project. Green Buildings fundamentally require energy modeling and a holistic approach to building design; LIPA's program had in place the technical expertise to provide this service – Technical Assistance (TA) firms. Commissioning of all energy related systems is a pre-requisite for green buildings, and LIPA's TA firms, some of which are the nation's leaders in their field, could also provide this service. Lastly, LIPA's financial incentives, aimed at reducing the capital cost impact of energy efficiency, were already in place. Three major hurdles identified by opponents of the green building process, energy modeling, commissioning, and additional capital cost, were easily addressed by participating in LIPA's CCP. Additionally, LIPA's other programs such as Solar Pioneer and Green Choice also provided owners a means to meet USGBC LEED credits for renewable and green power.

While the USGBC had several LEED programs in place, either as formal programs or pilot efforts, it was decided that LIPA's green building incentives would target new commercial and major renovation projects, those projects that were registered with the USGBC seeking new construction certification, LEED NC. In order for a customer to be eligible for additional incentives, the owner's commitment to the project would be proven through USGBC registration. Additionally, all projects would need to submit an application for participation in the CCP. The true benefit of following the LEED process is seen through the whole building integrated design process. All members of the design team, ownership, and other stakeholders in the project have input into the project's design and decision-making process. In an effort to ensure that LIPA became part of this process, it was required that the CCP application be submitted before construction documents are completed.

Since the LEED guideline allows for customization of the credits sought, there is no guarantee that any particular green building project would optimize the energy performance of the building, but rather seek credits in non-energy related fashion. The minimum energy performance was all that was required; LIPA's CCP had its goal of achieving energy savings beyond minimum requirements. In order to minimize the risk of having these contradictions occur, it was required that the developer or building owner and their design team agree to set an energy efficiency goal of at least 20% better than the pre-requisite minimum level of energy efficiency, those defined by the requirements of ASHRAE 90.1-2004.

LIPA's CCP has provided technical assistance for complex project since its inception. Of the hundreds of customized rebates and whole building projects that have been processed, less than 10% have taken advantage of formalized technical assistance through LIPA. There are several factors that would drive this result, including the overall program structure, budgets and contractual issues, and guidelines used for assigning projects to technical assistants. Furthermore, the availability of in-house technical support to meet the project goals was a primary driver. LIPA's technical assistants have been selected based on response to formal requests for proposals. A total of 10 firms are on retainer to provide energy modeling and other assistance as required by the CCP. These firms are located throughout the northeast and include firms in Boston, New York City, as well as Long Island. These firms have demonstrated expertise in energy modeling and green building and members of these firms have received recognition from the USGBC as LEED APs, something that LIPA's in-house expertise lacked.

For a green building, LIPA has extended its use of the TA firms to take advantage of these experiences and market presence. Prior to the implementation of the green building incentives, technical assistance was limited to projects greater than 50,000 square feet. A cost share was also required that would translate to a financial commitment to the project by the owner. Many owners felt that some of the services that were to be provided by the TA firm were assumed to be provided by the already contracted design team, typically the mechanical engineer. This was further confused by the fact that all in-house energy analysis was provided free of charge with no limitation on building size or complexity. All of these factors limited the effectiveness of LIPA's whole building approach and the use of the TA. With green buildings, the size limitation and cost sharing were waived in an effort to maximize the access to these firms. LIPA's has committed to pay 100% of the LEED energy modeling. Additionally, since energy modeling was clearly required by the LEED process and not typically part of the architect or engineer's scope of work, building owners would need to look elsewhere for the service, in this case to LIPA. Nearly all of the work assigned to TA firms in 2007 was related to green buildings.

Another fundamental requirement of green buildings is that the energy systems must be commissioned. LIPA will pay up to 100% of the cost for fundamental and additional commissioning of energy related systems up to \$100,000. When firms were asked to respond to a request for proposals to provide technical assistance in 2004, commissioning experience was included as a sought after trait. More than half of the firms currently under contract to provide TA services have provided commissioning on projects on Long Island, the NY metropolitan area, and in other parts of the country. Therefore, LIPA had in place, the ability to provide commissioning services through its existing TA services. To date, no formal commissioning requirement were in place for LIPA's CCP, but several projects had been piloted with some commissioning services. However, the focus of LIPA's commissioning was related to those systems that had been covered by a rebate, systems that saved electric energy. In the case of green buildings, other non-electric systems would need to be commissioned such as a boiler, furnace, or other fossil fuel fired systems.

It was determined that LIPA would fund the commissioning services for green building projects. While this would include the pre-requisite fundamental commissioning as well as the enhanced commissioning, the cost share would be limited to the electric end uses only. Commissioning of systems that were non-electric would be the responsibility for the owner. Based on the experience of LIPA in consultation with several of the TA firms who exhibited a wide range of commissioning experience, a cap of \$100,000 was put in place.

In an effort to offset the cost of certification, LIPA will provide \$1,000 for each of 25 credits that have been determined to be directly, or indirectly related to energy consumption, offering a maximum of \$25,000 for achieving LEED points that are related to the building's energy performance. The following LEED NC 2.2 credits have been identified for additional LIPA incentives. For each, a brief explanation of the intent of the credit is provided along with the reasons why LIPA is providing funds to promote the credit.

- SS Credit 7.2: Heat Island Effect: Roof (1 point) - To promote the use of cool roof technologies in an effort to minimize the impact on microclimate. With such technology comes a reduction in the cooling energy required during the summer peak season when energy costs are high and potential strains on the utility infrastructure could be at their worst.
- SS Credit 8: Light Pollution (1 point) - Minimize light trespass and reduce sky glow through careful selection and specification of energy efficient outdoor lighting. LIPA has been providing customers with utility owned outdoor lighting solutions for several years and has worked with many advocates in the industry with the goal of promoting the same dark-sky friendly approach to outdoor lighting.
- WE Credit 3.2: Water Use Reduction: 30% Reduction (1 point) - Maximize water efficiency to reduce the burden on municipal water supply and associated pump energy. A sophisticated

network of local and municipal water authorities whose electric service provider is LIPA provides Long Island's water supply. Any reduction in water usage at a building would not only reduce the customer's water bill, but a reduction in pumping energy would provide these water districts with savings potential as well.

- EA Credit 1: Optimize Energy Performance (up to 10 points) - Design and construct high performance buildings to reduce environmental and economic impacts associated with energy usage. This is the primary goal of the CCP as well and the additional green building incentive structure.
- EA Credit 2: On-Site Renewable Energy (up to 3 points) - Encourage distributed generation to reduce the burden on the utility infrastructure. Since 1999, LIPA's Solar Pioneer Program has been recognized as a leader in renewable energy programs. The use of such technologies as photovoltaics is encouraged by the CCP and additional incentives are available through the Solar Pioneer budget, in addition to those described within the CCP Green Building incentives.
- EA Credit 5: Measurement & Verification (1 point) - Promote the installation of energy measurement technologies that allow for accountability of energy consumption over time. The belief that knowledge is power drives LIPA's support of this credit. Without knowing where a building's energy consumption is going, a plan for corrective action cannot be taken.
- EA Credit 6: Green Power (1 point) - Encourage participation in LIPA's Green Choice Program as a means to promote the use of renewable energy technologies. Green Power programs fund research and development into environmentally friendly power generation solutions.
- EQ Credit 1: Outdoor Air Delivery Monitoring (1 point) - Provide capacity for ventilation monitoring to help sustain occupant comfort and reduce energy consumption. The heating and cooling of excessive amounts of outside air, in the summer and winter, increases operating costs. Proper adjustments to determine the correct amount of delivered air cannot be made without instrumentation in place.
- EQ Credit 6.1: Controllability of Systems: Lighting (1 point) - Encourage the installation of advanced lighting controls which promotes energy conservation. Lighting is one of the largest consumers of energy in buildings. Recent advances in source technologies is limiting the savings associated with better lamps, ballasts, and fixtures, but a vast amount of energy can be saved through the proper control of these systems.
- EQ Credit 6.2: Controllability of Systems: Thermal Comfort (1 point) - Encourage the installation of comfort control systems that enhance the well being of occupants without sacrificing energy consumption.
- EQ Credit 7.2: Thermal Comfort: Verification (1 point) - Provide a means to collect data about building performance to determine thermal comfort over time. Similar to an energy management system, feedback about occupant comfort can lead to the development of a plan to minimize energy use.
- EQ Credit 8.2: Daylight & Views: Views for 90% of Spaces (1 point) - Promote the use of daylighting. The sun is a source of free energy and daylighting systems epitomize high performance in green buildings. These systems also track the utility load nicely during the summer peak months when conservation is most desired.
- ID Credit 1: Innovation in Design (limited to 1 point) - To promote innovative design solutions and reward exceptional performance. LIPA's focus here is on encouraging innovations in energy conservation.
- ID Credit 2: LEED Accredited Professional (1 point) - To support and encourage the goals of the USGBC and green buildings. As a member organization, LIPA is proud to show its support of the green building profession and those that have proven their knowledge, skills, and

understanding of green building practices and principles, particularly within the Long Island marketplace.

Lastly, LIPA has increased the maximum allowable rebate for whole building projects from \$400,000 to \$500,000 for LEED Green Buildings. This further supports LIPA's financial commitment to the Green Building market.

## **COMPARISON TO OTHER PROGRAMS**

One of the attributes that makes the LIPA program stand out above other utility or municipal green building program is that it addresses nearly all of the concerns and barriers to implementing a green building project. Other programs provide broad financial incentives to reward green building projects; LIPA's program provides incentives directed to each of the significant cost impact items, energy modeling, commissioning, increased capital costs, and incentives to offset the cost of USGBC certification. Furthermore, LIPA is an active participant in the process, not simply a funding mechanism or educational resource. As such, there are long term relationships to be built between LIPA, its customers and the designer's responsible for the projects. This provides for the fundamental market transformation goal of the initial LIPA CCP.

In 2005, the Federal government finalized an update to the Energy Policy Act. Known as EPACT, the policy set a broad array of energy efficiency regulations and outlined incentives aimed at promoting a higher level of energy efficiency beyond the requirements. For the commercial sector, EPACT provided for Federal tax deductions for energy efficient buildings and other incentives for renewable energy. Buildings that achieved energy savings of 50% or more relative to the minimum standards of ASHRAE Std. 90.1-2001 would be eligible for deductions up to \$1.80 per square foot of building area. Since owners of buildings participating in LIPA's CCP and seeking green building certification were required to exceed the 2004 ASHRAE standard by at least 20%, these projects would be well on their way to meeting the EPACT requirements as well. Furthermore, in order to prove that the EPACT requirements were met, energy modeling was required, something that would be needed to show LEED compliance and something that LIPA could provide. The commonalities between LIPA's CCP, the USGBC's LEED rating system, and the EPACT Tax deductions would provide an opportunity for increased participation in LIPA's CCP, as owners would begin to see the benefits of LIPA's programs.

## **OTHER INCENTIVE CONSIDERATIONS**

Several other incentives were considered during the design of the green building incentive program. As stated before, the program intended to address market barriers to energy efficiency and green buildings by providing resources, technical or financial, within the context of LIPA's corporate commitment to the Long Island community. These included providing funds to offset registration and certification fees. It was proposed that the registration fee with the USGBC, \$450 for LEED APs, be paid as part of the LIPA incentive. This would be reimbursed to the customer after project completion. However, because this fee was relatively small, it was felt that the cost of registration was not a hurdle that needed to be addressed by LIPA. The cost of USGBC certification could be substantially higher, however, and could be as much as \$22,500 for large-scale projects. It was expected that most projects on Long Island would be of modest size, less than 50,000 square feet, and the certification fee, which varies based on building size, would be limited to \$1,750. Again, the relatively low cost of these fees in comparison to other items led to the exclusion of such incentive from LIPA's program.

Through research into other programs in place at the time of design, it was determined that other areas of the country were providing financial incentives which varied based on the level of certification achieved. For instance, projects achieving certification would be eligible for one level of incentive and those achieving increasing levels of certification, e.g., silver, gold and platinum would be rewarded with additional financial incentives. Successive \$10,000 bonus awards were proposed for each level above the basic certification. Achieving Platinum certification would provide another \$30,000 above any other LIPA incentives offered on the project. Since increasing certification would not necessarily translate into additional energy savings, such bonus incentives were also excluded for the LIPA offering.

Other considerations that were entertained during the program design included funding LEED charettes, or providing the services of a LEED AP to guide the project through the certification process. Many of the members of LIPA's TA firms have received recognition as LEED APs from the USGBC and their services could be used for such a purpose. These were ultimately excluded in favor of allowing the local market to meet these needs. While it was ultimately decided to provide \$1,000 for each energy related LEED NC credit up to \$25,000, it was originally proposed that all 69 credits be eligible for the \$1,000. Because of budgetary concerns as well as the concern that LIPA funding would be used for items unrelated to energy, such as credits associated with materials or site issues, this was limited to the currently adopted 25 points.

## **RESULTS**

Since formally adopting the Green Building incentives, there has been a marked increase in participation in the whole building approach. While many market transformation programs attempt to impart their goals upon the marketplace in an attempt to enact change, LIPA's Green Building incentives capitalize on a growing but underutilized market trend, LEED Green Buildings. The relationship between LIPA and the design community, a group of professionals sought after for market transformation, has improved through the introduction of these incentives.

Since the inception of LIPA's Commercial Construction Program in 2000, only 14 whole building projects have been completed. Participation in this component of the program has been limited by several factors, ranging from project size and scope to a general lack of understanding how such an approach could benefit a project. The whole building design approach has its roots in energy modeling, a systematic approach involving multiple computer simulations used to aid in the decision making process and the design of energy efficiency alternatives. Engineering firms have been familiar with similar load calculation software, but were not using it in such a way that promoted interaction amongst the members of the design team. A fundamental pre-requisite for LEED certified green buildings was to prove minimum energy performance through the use of simulations, a service offered by LIPA. It was expected that building owners and developers, as well as architects and engineers seeking LEED certification would have renewed interest in energy modeling. Since January 2007, LIPA has received applications for more than 20 projects and is in various stages of modeling ranging from scoping and preliminary assessment to submission to and review by the USGBC. This represents a 10-fold increase in whole building program participation, a trend that is expected to continue as the green building movement gains even more momentum.

The identification and development of project leads for LIPA's CCP has ranged from customer interest to contractor leads. Leads have also come from members of the design team, but this "value-added" service that designers provided to their clients may have limited interest and benefit to the design team and may potentially interfere with the design timeframe. With green buildings, the value of including an energy modeling professional as well as a commissioning authority has become clearer to those who may be tasked with championing the LEED certification. In many instances, green building responsibility lies with the project architect. While there is no formal lead tracking system, it has

generally been perceived that more and more architects are looking to LIPA when considering their next green building projects. Other professionals involved in the design and construction of green buildings, such as contractors of construction management firms have also put LIPA at the top of their list when considering green building team members. This elusive connection between the design community and LIPA programs has clearly been improved through LIPA's green building incentive and partnership in customer's green building projects.

## **ENERGY SAVINGS**

While there are significant benefits associated with green buildings, the reduction of building energy usage is the primary concern for LIPA and the underlying reason for the incentives offered to promote and support green buildings. LIPA's CCP has been providing technical and financial assistance to more than 3,000 projects since its inception in 2000. The primary focus of the program has been new construction, although equipment replacement in existing buildings has provided a significant portion of the savings associated with the program efforts. The basis for determining the energy savings for the technologies involved in the CCP is the minimum requirements of the local or State Code, in this case, the Energy Conservation Construction Code (the Code). In 2002, the Code underwent a long overdue updating, and until its next revision, has been considered the baseline for energy savings comparison. The Code is based on the International Code and ASHRAE Std. 90.1-1999. It is important to note that these minimum requirements are not the same as those adopted by the USGBC under the LEED NC version 2.2. The current version of LEED NC uses the 2004 edition of the ASHRAE standard. This standard is more stringent than the previous versions and the current NY State Code. Analysis indicates that simply meeting the 2004 ASHRAE Standard can provide a 6% to 18% improvement in energy performance compared to the State Code or ASHRAE Std. 90.1-1999<sup>9</sup>. This varies with building type and end use, but clearly the minimum requirements of a LEED green building would exceed those of a traditionally designed and constructed non-green building. Therefore, any green building project that participated in the LIPA CCP would automatically achieve energy savings. Furthermore, in order to receive the additional LIPA Green Building Incentives, owners must commit to a minimum of a 20% energy savings over the ASHRAE Std.90.1-2004. While many of the LIPA green building projects have not yet been completed, estimates indicate that actual savings is in the range of 25% to 35% compared to the NY State Code baseline which is approximately twice the average annual savings previously achieved through the CCP Whole Building Design Approach.

## **CONCLUSION**

The incentives offered by LIPA for Green Buildings, those that are described in this paper, are currently based on the USGBC LEED for New Construction guidelines. LIPA is currently developing additional incentive structures for many of the certification systems including LEED EB (Existing Buildings), LEED CS (Core and Shell), and LEED for Homes. We believe that LIPA is one of the few utilities offering incentives for this market segment, and further believe that LIPA will be leading the way with the most comprehensive Green Building offering of any utility in the country. Accordingly, those involved in the planning and implementation of Green Building incentives for other utilities, cities, or local communities would benefit from the data presented. This data indicates that there are several benefits achieved by offering Green Building Incentives. These include additional energy savings, increase program participation and improved relationships between the utility and the design and construction community.

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<sup>9</sup> LIPA commissioned study by SEI Companies, May 2007

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