

Exelon pursued LEED certification to help jump-start the green building movement in Chicago and made history in the process

PLATINUM RECORD

Who knew that by consolidating its offices, Exelon Corp. would actually end up setting a record for the *largest* office space of its kind? That's the irony of this new headquarters project in Chicago. In April 2007, the U.S. Green Building Council awarded the new headquarters the Leadership in Energy and Environmental Design (LEED) Platinum Commercial Interiors (CI) certification. This made Exelon's headquarters the largest office space in the world to be LEED-CI certified at the Platinum level.

In the spring of 2004, Exelon—one of the nation's largest electric utilities with more than \$15 billion in annual revenues—embarked on a project to consolidate its down-

town Chicago locations to increase productivity and reduce long-term occupancy costs. To accomplish this, Exelon chose to renovate an existing space to LEED standards rather than building new. The project involved the design and construction of more than 220,000 sq ft of office space on 10 floors in Chase Tower, a landmark building in downtown Chicago.

Interior Space International led a team of consultants with the goal to achieve the highest LEED standards. Lighting Design Alliance, Chicago, was commissioned as the lighting designer. Exelon decided to pursue LEED Platinum as a way to lead the green building movement in Chicago and around the country.

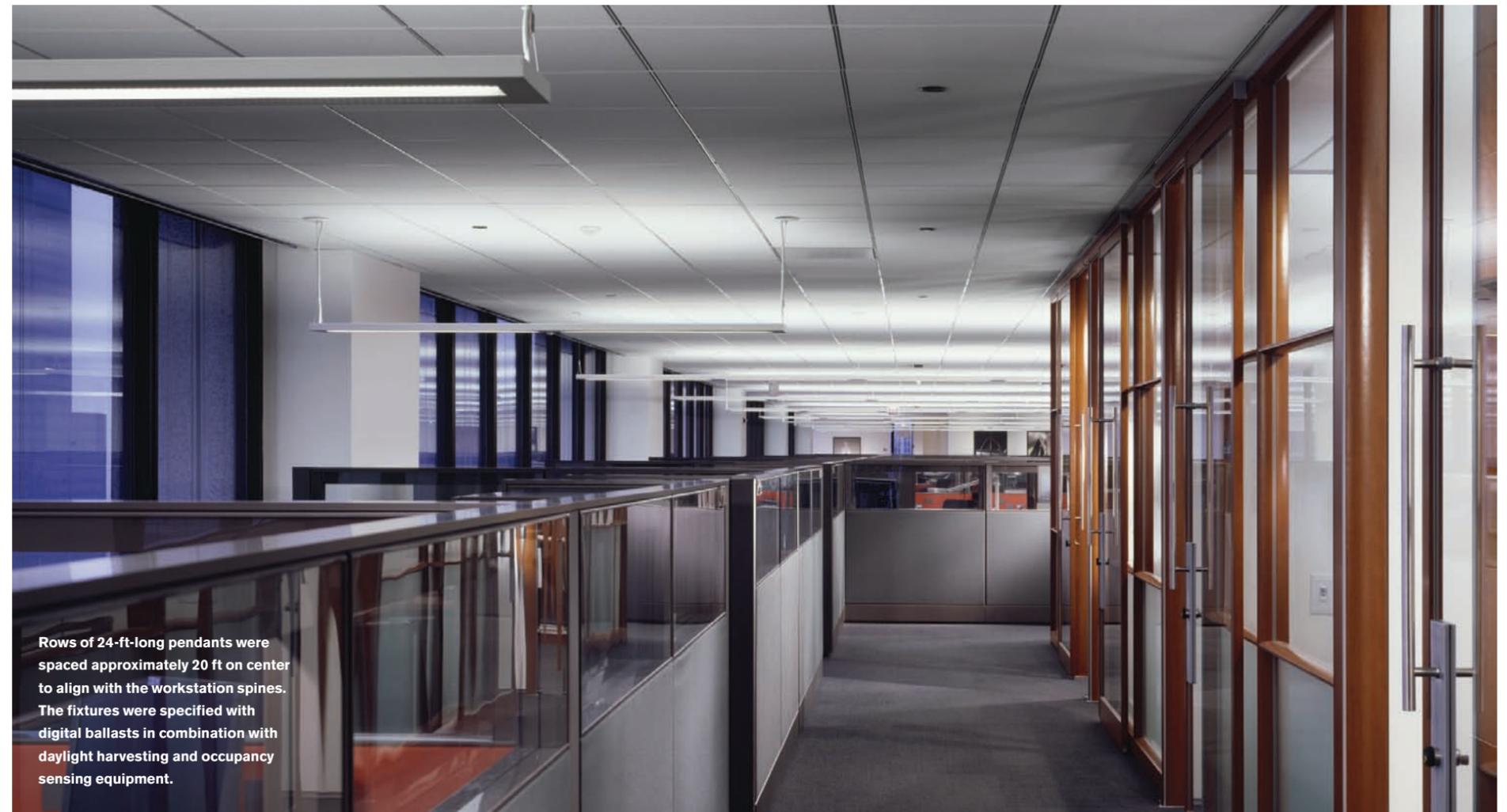
The general open-office pendant concept was carried to the private offices. These have 8-ft-long pendant fixtures controlled by ceiling-mounted occupancy sensors with a wall dimmer for manual override.

Photos: Steve Hall, Hedrich Blessing

THE GRADES ARE IN
Exelon headquarters received 44 of 57 possible points to earn LEED Platinum certification.

LEED for Commercial Interiors v2.0			
44 Points Achieved			
Certified: 21 to 26 points Silver: 27 to 31 points Gold: 32 to 41 points Platinum: 42 or more points			
6	Sustainable Sites		Possible Points: 7
Y			
3	Credit 1 Site Selection		3
1	Credit 2 Development Density and Community Connectivity		1
1	Credit 3.1 Alternative Transportation, Public Transportation Access		1
1	Credit 3.2 Alternative Transportation, Bicycle Storage & Changing Rooms		1
1	Credit 3.3 Alternative Transportation, Parking Availability		1
2	Water Efficiency		Possible Points: 2
Y			
1	Credit 1.1 Water Use Reduction, 20% Reduction		1
1	Credit 1.2 Water Use Reduction, 30% Reduction		1
11	Energy & Atmosphere		Possible Points: 12
Y			
Y	Prereq 1 Fundamental Commissioning		
Y	Prereq 2 Minimum Energy Performance		
Y	Prereq 3 CFC Reduction in HVAC&R Equipment		
3	Credit 1.1 Optimize Energy Performance, Lighting Power		3
1	Credit 1.2 Optimize Energy Performance, Lighting Controls		1
1	Credit 1.3 Optimize Energy Performance, HVAC		2
2	Credit 1.4 Optimize Energy Performance, Equipment & Appliances		2
1	Credit 2 Enhanced Commissioning		1
2	Credit 3 Energy Use, Measurement & Payment Accountability		2
1	Credit 4 Green Power		1
12	Indoor Environmental Quality		Possible Points: 17
Y			
Y	Prereq 1 Minimum IAQ Performance		
Y	Prereq 2 Environmental Tobacco Smoke (ETS) Control		
1	Credit 1 Outdoor Air Delivery Monitoring		1
1	Credit 2 Increased Ventilation		1
1	Credit 3.1 Construction IAQ Management Plan, During Construction		1
1	Credit 3.2 Construction IAQ Management Plan, Before Occupancy		1
1	Credit 4.1 Low-Emitting Materials, Adhesives & Sealants		1
1	Credit 4.2 Low-Emitting Materials, Paints and Coatings		1
1	Credit 4.3 Low-Emitting Materials, Carpet Systems		1
1	Credit 4.4 Low-Emitting Materials, Composite Wood and Laminate Adhesives		1
1	Credit 4.5 Low-Emitting Materials, Systems Furniture and Seating		1
1	Credit 5 Indoor Chemical & Pollutant Source Control		1
1	Credit 6.1 Controllability of Systems, Lighting		1
1	Credit 6.2 Controllability of Systems, Temperature and Ventilation		1
1	Credit 7.1 Thermal Comfort, Compliance		1
1	Credit 7.2 Thermal Comfort, Monitoring		1
1	Credit 8.1 Daylight & Views, Daylight 75% of Spaces		1
1	Credit 8.2 Daylight & Views, Daylight 90% of Spaces		1
1	Credit 8.3 Daylight & Views, Views for 90% of Seated Spaces		1

Source: Excerpted from the USGBC project score sheet.



Rows of 24-ft-long pendants were spaced approximately 20 ft on center to align with the workstation spines. The fixtures were specified with digital ballasts in combination with daylight harvesting and occupancy sensing equipment.

FIVE-POINT PLAY

To achieve LEED Platinum, the team pursued five points related to lighting and controls:

- EA (Energy & Atmosphere) Credit 1.1: *Optimize Energy Performance, Lighting Power*: Reduced lighting power density to 35 percent below the ASHRAE/IESNA 90.1-2004 standard (three points). The project was designed to consume 0.85 watts per sq ft, however Exelon has determined that its actual consumption is 0.60 watts per sq ft after reviewing its electrical bills.
- EA Credit 1.2: *Optimize Energy Performance, Lighting Controls*: Installed daylight harvesting controls in all regularly occupied spaces within 15 ft from windows (one point).
- EQ (Environmental Quality) Credit 6.1: *Controllability of Systems, Lighting*: Lighting controls provided to enable at least 90 percent of occupants to make adjustments to suit individual task needs and preferences, and to permit transient groups to share lighting controls in all shared multi-occupant spaces (one point).

Providing the recommended lighting levels for all the spaces while reducing power density to 35 percent below the standard proved challenging. To do this, the team concentrated on energy-efficient lamp sources controlled by occupancy and daylight-responsive devices as the main design tools.

For the open offices, the general and functional lighting was provided with indirect/direct pendant fixtures (96 percent indirect and 4 percent direct) with one 54-W T5HO lamp cross section. The client selected Focal Point's Twelve fixtures after a

review of calculations and mock-ups using products from several manufacturers. Rows of 24-ft-long pendants were spaced approximately 20 ft on center throughout the space so that the fixtures could be aligned with the workstation spines. The fixtures were specified with Lutron's Ecosystem digital ballasts in combination with daylight harvesting and occupancy-sensing equipment. Eight photocells were used per floor (four per side of the building) mounted and integrated within the pendant fixtures, providing constant reading to adjust artificial light levels dur-

ing the day. Additionally, occupancy sensors were used to ensure that the open-office fixtures are turned off after hours of operation.

An adjustable task light was provided for each workstation. The task light is controlled separately from the pendant system to enable the occupants to make adjustments to suit individual task needs and preferences. Finding a task light for more than 90 percent of the end users that was efficient enough to meet the energy allowance was possible with the use of LED lamps as a source. The fixtures (Lightolier's

Cirque) consume only 9 watts, and were also specified for their aesthetics and how they functioned within the space. Again, the fixture selection followed an intensive review of all the available LED task lights on the market at the time and testing by Exelon's employees.

Perimeter accent lighting for wall washing and artwork was added for visual interest and to improve perception of vertical brightness using a combination of compact fluorescent downlights (Lightolier Calculte) and wall washers with 26-W lamps. Low-voltage adjustable downlights

Daylight, Motorized

The design team has decided to add more windows to the project, enabling more daylight to enter the space. Three cheers for sustainable design. But now the question becomes, how do you *manage* all that daylight.

Daylighting employs a regulated balance of electric and natural light in conjunction with the building's systems, finishes, fabrics and furnishings that combine to make up its interior. Controlling daylight requires a well-engineered shading system. A variety of window and shading system technologies have been developed to manage daylight levels, including horizontal louvers, vertical blinds, draperies and roller shades. These devices range in price, flexibility and ability to effectively control light.

Another technique—electronically controlled shading systems—may be gaining traction within the architect and design community. “Automation allows the shading system to be integrated into other building controls—maximizing the potential for energy savings,” says Stacey Kim, market development manager for Lutron Electronics Co., Inc. “As an added benefit, the system not only makes a building more efficient, but simultaneously reduces sun glare, combats solar heat gain and protects the visual aesthetics of the space, enhancing its value.”

Despite the high-tech nature of motorization, specifying the right shade fabric might be the most critical factor when managing the daylight in a space successfully. The openness factor, color and composition of the fabric shapes how the shade will interact with and manage the sun's light and heat energy—also known as solar radiation.

Finally, natural light plays a major role in the LEED rating system, and building controls can help the design team chalk up certification points. For commercial interiors, only 21 points are needed to achieve LEED-Certified status. Controls can contribute up to 12.5 points in four of six LEED-CI credit categories. For new construction, a minimum of 26 points is needed for Certified status and controls can contribute up to 20 points in four of six LEED-NC credit categories.



with 37-W MR16 lamps were used sporadically in key elements such as art pieces and millwork details.

The general open-office pendant concept was carried to the private offices. These have 8-ft-long pendant fixtures controlled by ceiling-mount-

ed occupancy sensors (Lutron) with a wall dimmer for manual override. This facilitates the flexibility of the system in case partitions are relocated. All the private offices have an LED task light as well, which is controlled separately.

Exelon has state-of-the-art conference and meeting spaces in its new facility. General conference rooms have recessed narrow aperture lensed linear fluorescents for one T5HO lamp (Focal Point's Avenue B), low-voltage downlights for 37-W MR16 lamps over the tables and compact fluorescent wall washers for the perimeter walls. These rooms have controls (Lutron Grafik Eye 4000) programmed with preset scenes. Appropriate vertical and horizontal illumination was addressed for successful videoconferencing. The boardroom has LED mini spots concealed in the millwork to provide glow to a sparkling ceiling finish over the main table and perimeter incandescent downlights following the curve of the ceiling.

General corridors and support areas are controlled with dual technology occupancy sensors (Sensor Switch) and with an astronomical time-clock that can be programmed for a floor sweep-off. All the support areas have fluorescent lamps with energy-saving T8 lamps and ballast combination, using Philips lamps and Optanium ballasts by Advantage. Using this lamp/ballast combination was the best way to achieve the energy savings of 35 percent below the standard, without losing light quality.

MORE CREDITS

Maximizing daylight and views was achieved by placing private offices in the interior of the building and locating the open office workstations towards the windows.

In addition, Exelon reduced electricity consumption by more than



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43 percent and water consumption by 30 percent as compared to its previous space, creating a healthy and more productive work environment for its employees. Plumbing fixtures were chosen to significantly reduce water consumption as compared to standard City of Chicago code.

Air quality was improved through the use of low-emitting materials, paints, carpeting, furniture and finishes and the installation of high-density air filters. The design team convinced building management to use green cleaning products not only in its space, but in the rest of the building as well.

The design team chose materials for their recycled content and that were manufactured locally. Exelon purchased more than 60 percent of the project and construction materials from manufacturers located within 500 mi to reduce emissions associated with transportation. Three-quarters of construction waste was recycled or salvaged, and almost one-third of furniture and other materials from the existing facilities were reused to reduce waste.

Since the project is located at Chase Tower, it is near public transportation, and the site offers bicycle racks and showers for employees

who want to ride their bikes to work. This further reduces emissions.

To continue its green efforts, Exelon is buying Renewable Energy Certificates to offset 100 percent of electricity usage for the office space from regional, Green-e certified wind power.

Finally, the cost to produce this platinum record was not prohibitive. While Exelon will not release cost information for the project, it estimates that the design/construction cost premium for new space was less than 5 percent, and that the expected reduction in operating costs will recover this premium in less than five years based on energy savings alone. ♻️



About the Designers: Laura Roman, LC, Member IESNA (2005), joined Lighting Design Alliance in 2003 as project designer. Her project experience includes commercial, healthcare, hospitality, residential and retail projects. Ms. Roman is an International Associate AIA, Associate IALD member and a licensed architect in Ecuador, where she graduated with a Bachelor in Architecture from the Catholic University of Guayaquil. She currently serves on the IESNA Chicago Board of Managers as co-chair of education.



Interior designer Dennis Kluge, IIDA, is senior VP and business unit leader of Interior Space International. He is adjunct professor at The Harrington College of Interior Design, Chicago, and holds a BFA in Interior Design from The Harrington Institute of Design.



LEED consultant Helen J. Kessler, FAIA, LEED AP, Member IESNA (1993), principal of HJ Kessler Associates, is a USGBC Chicago Chapter Board member and chairs the chapter's Education Committee. She holds a Bachelor of Architecture from the University of Arizona and a Master in Business Administration from the Wharton School.