

STAPLES CENTER, HOME OF THE LOS ANGELES CLIPPERS, LOS ANGELES LAKERS, LOS ANGELES KINGS, AND LOS ANGELES SPARKS



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ARENA STATS

Location: Los Angeles, California

Began Construction: March 31, 1998

Opened: October 17, 1999

Seating Capacity: 20,000

Owner: AEG

Operator: AEG

Venue Uses: NBA, WNBA and NHL games, concerts, family shows, Grammy Awards and other high-profile events.

Construction Cost: \$407 million

ISO 14001 Certification: December 2010

STAPLES CENTER'S GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

STAPLES Center in downtown Los Angeles is undoubtedly one of the busiest arenas in the world, hosting more than 250 events and nearly 4 million guests each year. The arena is home to four professional sports franchises—the NBA's Los Angeles Lakers and Los Angeles Clippers, the NHL's 2012 Stanley Cup Champion Los Angeles Kings and the WNBA's Los Angeles Sparks—and also hosts many high-profile events, including the annual X Games and Grammy Awards. Other notable events include the 2004 and 2011 NBA All-Star Weekends, the 2002 NHL All-Star Game, the 2000 Democratic National Convention, and the 2011 World Figure Skating Championships.

Since the arena opened in 1999, STAPLES Center's operations team has aimed to run it as efficiently as possible. With the help of AEG, STAPLES Center has become a leader in environmentally better practices, boasting a 1,727-panel solar array atop its roof; high-efficiency lighting, equipment, and energy management systems; and waterless urinals, among other initiatives. AEG and STAPLES Center developed an environmental management system (EMS) to guide employees in reducing the environmental impact of STAPLES Center's daily operations. As a result, the STAPLES Center became the first U.S. arena to receive an ISO 14001 certification in 2010.

WHY GO GREEN?

Efficiency and innovation have always been important to STAPLES Center's management team. "We're always reminded by our ownership to save energy, save water, identify state-of-the-art technology and pass on these practices and lessons whenever possible," says Bill Pottorff, vice president of engineering for STAPLES Center and Nokia Theatre L.A. Live. "When you realize that this is truly a priority to our organization, you have to look for ways to do that. Beginning with the planning and design of STAPLES Center in 1998, this has always been our way of life."

"AEG's corporate sustainability program—the collection of information and recognition of the environmental priority—formally started in 2006 when our music branch AEG Live raised the question to our CEO," explains Jennifer Regan, global sustainability director at AEG, STAPLES Center's owner and operator. "They said, 'Hey, we've got artists and staff who care about the environment; we need to address our environmental impact.' The CEO realized that our clients and our content division were telling us that we needed to answer these questions. He turned to the company's corporate office and asked them to put together a green team."

WHERE TO START?

"STAPLES Center's management team have always been early adopters of innovative technology while being proactive in connecting with their corporate, government and community partners to identify best uses for these technologies," says Regan. "For example, they began installing electric charging stations for their guests beginning in 1999 when the arena first opened."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ STAPLES Center is the first U.S. arena to achieve ISO 14001 certification for an environmental management system (EMS), a written program setting forth environmental goals and practices.
- ★ The venue uses AEG's Ecometrics system to measure and report environmental data and performance.
- ★ The center implemented a variety of conservation measures through its EMS to reduce electricity consumption overall by 12 percent.
- ★ It installed a 1,727-panel solar array covering 25,000 square feet of the arena's roof. The 345.6-kilowatt system supplies 5 to 20 percent of the building's energy use (depending on load) and produces 525,000 kilowatt-hours annually, saving an average of \$55,000 per year.
- ★ In 2012 a comprehensive lighting retrofit replaced almost 3,000 halogen fixtures throughout the facility with more energy-efficient LEDs, saving nearly \$80,000 per year—2 percent of total energy costs.
- ★ Low-voltage lighting relays control the sequence and operation of all task, general and event lighting, illuminating groups for specific times and uses.
- ★ The facility switched to electronic ballast instead of magnetic ballast.
- ★ It uses variable-speed drives on all air handlers and one chiller.
- ★ The center has time schedules for and photo cell control of exterior lighting.
- ★ Super-efficient three-phase motors are in use.
- ★ All 178 conventional urinals were replaced with waterless urinals—for total annual savings of more than 7 million gallons of water and about \$28,200 in direct water costs.
- ★ The center documents and achieves at least a 50 percent landfill diversion rate annually in full compliance with California AB 2176, collecting cardboard, wood pallets and electronic waste and, with the help of Levy Restaurants, collecting glass, plastic and aluminum beverage containers.
- ★ Over 90 percent of STAPLES Center cleaning products have green certifications.
- ★ 100 percent of all toilet paper, paper towels and copy paper are a minimum of 30 percent post-consumer recycled content.
- ★ Electrical vehicle charging stations have been installed in adjacent parking lots and structures.
- ★ Public transportation is encouraged through partnerships with Los Angeles Kings, with ticket discounts offered to metro riders and other tenants and promoters.
- ★ Secure bike racks were installed on the venue property, and management is reviewing contracts for bike valet programs for major events.

Most of STAPLES Center's environmental initiatives began with behind-the-scenes efficiency projects. "A lot of it was just best practices in the industry," explains Pottorff. "One of our first projects was putting medium-volt 4160-volt variable frequency drives on our primary chiller here. That was about a 2¼-year payback. Those drives are typically done on 480-volt chillers, and we took it up a level. People had been doing them on medium-voltage chillers for a couple of years, which led us to believe we could go further. It was a fun project because we took a 480-volt drive card and put it into our 4160-volt chiller and basically tricked it. We got everything tweaked and fine-tuned and it's been running great ever since."

AEG's corporate sustainability department set out to develop an environmental program that would provide employees with guidance and the tools necessary to improve AEG's environmental performance. "We had a sustainability committee with leaders from each business unit meeting to develop a sustainability road map. We also included the STAPLES Center team on that committee as their wealth of experience and success stories helped everyone to see how beneficial an environmental and efficiency priority could be,"

Regan explains. "From the AEG side of the story, beginning in 2008, we engaged industry experts and consultants to help us identify projects and develop the core components of our environmental program, which we now call AEG 1Earth. The core components of the program are AEG's environmental policy, long-term goals and an environmental performance tracking system, AEG Ecometrics. As the home base and flagship venue, STAPLES Center was the test ground for early versions of Ecometrics and several other projects."

In 2008, STAPLES Center participated in a number of energy and water audits, one of which NRDC arranged through the L.A. Department of Water and Power, to analyze the building's energy and water use and identify opportunities for further efficiency enhancements. "We did an energy assessment and identified low-hanging fruit," says Regan. "The energy audit ultimately confirmed the importance of projects that our engineers had already proposed. Ultimately, the results helped the management team prioritize the opportunities and identify rebates." Among these confirmed efficiency opportunities were lighting and equipment retrofits, onsite solar panels, and waterless urinals, all of which have since been implemented.

STAPLES Center also implemented numerous lighting and equipment upgrades. “We’ve taken basically every incandescent bulb out on all three suite levels and replaced them with LEDs. That’s continuing in other areas of the building,” says Pottorff. These lighting retrofits, expected to be completed in 2012, will replace more than 3,000 halogen fixtures with LEDs and will save an estimated \$80,000 annually in energy costs. “Beyond energy savings, rebates from the utility and lowered labor costs also bring down the costs of this investment,” notes Sam Kropp, vice president of building operations for STAPLES Center and Nokia Theatre L.A. Live. “We had our capital outlay and then the utility reimbursed us for a portion of that cost. And, I think most notably, it’s the lack of labor needed to change these incandescent bulbs day in and day out that is most appealing. We have about 160 suites that basically had a minimum of six fixtures each, and now we’ve replaced all that with LEDs. That’s a big savings we realized there.”

One of the STAPLES Center’s biggest projects in 2008 was the installation of a 1,727-panel solar array covering 25,000 square feet of the arena’s roof—the largest solar array at any sports facility in the world at the time. The 345.6-kilowatt system produces 525,000 kilowatt-hours annually, saving an average of \$55,000 a year. “On a sunny day with a low base load of energy use, the panels provide up to 20 percent of energy use,” explains Regan. “Because we have over 250 events per year, including mega-events like the Grammy Awards and NBA and NHL playoffs, the panels provide only 5 percent of our total annual energy use.”

By 2009, with a number of impressive efficiency projects under their belt, AEG and STAPLES Center wanted to go a step further in formalizing their environmental program. “We wanted to take on our biggest challenge yet: engaging our staff, vendors and tenants,” says Regan. “Collectively, we decided to develop a formal environmental management system to systematize their efforts. They evaluated the prospect of pursuing LEED certification for the building but ultimately decided to go after ISO 14001 certification of their EMS instead.”

Regan explains AEG and STAPLES Center’s decision: “We were introduced to two key environmental systems in 2007: LEED and ISO 14001. We started to use the LEED standards internally to identify building projects, but they didn’t provide much guidance on how to engage and train staff. Having already performed a formal energy audit, AEG was comfortable that the STAPLES Center’s operations and engineering team were proficient in terms of building efficiency in line with many of the LEED guidelines,” she continues. “We understood LEED’s value, but our challenge wasn’t in knowing what technology to put in place; it was in understanding how to engage other parts of our venue in the environmental program. So we thought that the most important thing was to engage our employees, and we selected the standard we could use to that end.”

Unlike LEED’s fixed, environmental infrastructure-based requirements, an EMS is a self-defined written framework

describing an organization’s environmental best practices and goals, including how to integrate environmental responsibilities into its staff training and job responsibilities. “ISO 14001 does not have a rating system—it identifies the activities and topics that must be addressed but allows the applicant to define how it will address them,” Regan explains. “As ISO 14001 is self-defined, some people say it has potential to be a weaker third-party certification. But unlike LEED, ISO 14001 requires an annual third-party audit to ensure you comply with your self-defined program as well as with local and federal laws. LEED might be stronger about prescribing and ranking what environmental features should be implemented, but ISO is stronger in defining how thoroughly to train and communicate your initiatives to staff and how to assign environmental responsibilities throughout your operations,” she points out. Although LEED has always been on the agenda for STAPLES Center, Regan says, “LEED doesn’t have an annual surveillance audit and doesn’t get too prescriptive in terms of staff engagement. Since a lot of our efficiency programs depend on how people manage our buildings, ISO was the first priority for us.” The ISO 14001 emphasis on staff training and annual auditing were key reasons why STAPLES Center pursued ISO certification first.

Examining each department and the role of its staff members in the company’s environmental performance was an essential piece in the ISO and EMS process. “We did a formal environmental impact assessment and met with the head of each department and identified which job positions in their department had any impact on the environmental impacts of the company,” Regan explains. “This process helped the company understand where the impacts were and identified additional ways our staff could play a role in reducing certain impacts. Everyone has a small impact on consumption of paper and electricity. But a thorough review of each department’s environmental impact helped us identify specific initiatives for each department. For example, only security could impact the energy consumption of the security scanners by unplugging them at a certain times, while our box office staff could identify additional recycling receptacles that would be needed because their office uses more paper than our other offices.”

Developing an EMS has helped expand the environmental program consistently throughout the entire company. Starting in 2010, STAPLES Center created an organization-wide green team that engages all arena divisions in department-specific environmental initiatives. “We engaged all levels of management to create an arena-wide green team,” says Regan. “We had relied heavily on operations and engineers, but now with the green team, we are able to engage guest services, human resources, security, our premium-seating staff and our food and beverage partner, Levy Restaurants, which really didn’t happen till we did the ISO certification.”

Getting the EMS in place required setting aside time each week to focus on documentation work. “The average time to develop an EMS is three hours a week for two months,” says Regan. “This mainly encompasses documenting practices

AEG/STAPLES ISO 14001 Certified Environmental Management System

Standard Operating Procedures and Training Include:

- ★ Chemical acquisition forms
- ★ Energy conservation guidelines
- ★ Environmentally preferable procurement guidelines
- ★ Environmental activities risk ranking
- ★ Generator testing procedures
- ★ Green event services
- ★ Landscape and hardscape management plans
- ★ Hazardous communication program
- ★ Hazardous and universal waste program
- ★ Integrated pest management plan
- ★ Lighting policy
- ★ Paint management plan
- ★ Refrigerant audit log
- ★ Solid waste guidelines
- ★ Spill prevention plan
- ★ Water conservation guidelines

that haven't been previously recorded, and occasionally identifying new practices to implement." There is also time spent with ongoing documentation for the EMS, she notes. "The average time to maintain an EMS is three hours per month. This includes training refreshers, green team meetings, identifying new things to implement and updating documentation to reflect changes in process or new practices." Although there is no cost to developing the EMS documentation or process, there are costs to achieve ISO certification. According to STAPLES Center management, the external audit and ISO 14001 certification initially cost between \$8,000 and \$10,000, with an annual recurring cost of between \$1,500 and \$3,000, depending on the size of the venue.

The documentation process may be time-consuming, but it pays off. "Everything we do has to be documented, and it was a big deal to set it up—it took over a year," recalls Pottorff. "But once you get it, and get the certification, you realize that it's really beneficial because every little bit of information that we could ever need is right there on the computer."

CHALLENGES: OVERCOME AND ONGOING

One of STAPLES Center's more impressive environmental initiatives was the replacement of the arena's 178 water-flush urinals with waterless urinals in 2008. But this project's

approval took some time, explains Pottorff. "My first challenge with the urinals was many years ago. Not many people know this, but I tried to get them in the building two years before they actually happened," he says. Waterless urinals were still an unseasoned technology at the time, and many cities and facilities were still squeamish about their performance in large facilities. "They weren't really approved by the city of Los Angeles, and nobody really knew what to do about them," Pottorff continues. But STAPLES Center's operations and engineering team was adamant about the fixtures' water savings and fought to pilot this technology at the arena. "Funny enough, two years later they're in the building and everybody loves them," Pottorff laughs.

Before 2008, each of the STAPLES Center's urinals consumed 44,000 gallons of water a year. The 178 Falcon waterless urinals that replaced these flush fixtures save more than 7 million gallons of water per year and about \$28,200 annually in direct water costs. "We have estimated that we are saving approximately \$2,350 per month at STAPLES Center in direct water costs, not factoring in sewer charges and any other municipal taxes," says Pottorff. "Each urinal saves roughly 4.5 hundred cubic feet [of water] per month."

STAPLES Center is a big advocate for the waterless technology and has been able to debunk a lot of the uncertainty surrounding the fixtures with the success of its installation. "People ask us about them all the time," says Pottorff. "Our response is always that they are fantastic, as long as you do the maintenance exactly as it's recommended." Maintenance mainly includes routinely flushing out the pipes and replacing cartridges. "We actually send a camera down random pipes annually, just to have a look in the pipes and see if anything is going wrong," Kropp adds. "And we haven't had any issues yet. We do get an occasional hiccup with it, but it's not like before when we had the water urinals and people would throw paper towels in. We don't have stoppages like we used to with the standard flush urinal." Continuous training of staff about the upkeep of the urinals has contributed to this success, Pottorff explains. "Training is ongoing, and the company, Falcon, will come out whenever we ask them to at no charge and we'll have a refresher course for the maintenance staff," he says.

Even with their strong existing environmental achievements, STAPLES Center executives are constantly looking for ways to improve. Increasing recycling rates is at the top of their to-do list. "We are really working on public recycling at the arena, and that's something AEG | Earth and Jennifer Regan are key partners in," says Kropp, "in trying to get the appropriate capital to get the right receptacles and branding in the public spaces, as well as the PSAs, and trying to fit that in with game script every night on our center bowl scoreboard. So we're hopeful that we'll succeed in that endeavor, which has been a challenge the last five years."

The current waste program achieves an event waste diversion rate of up to 35 percent, but the operations team is still looking to incorporate a public-facing program, Kropp says. "From an operations standpoint, my biggest challenge right now is finding an aesthetically pleasing receptacle that

AEG Ecometrics Data Collection System

Resources Consumed:

Natural gas
Electricity
Water
Recycled water
Fuel (propane, diesel, petrol, fuel oils 1-4)
Solvents (hazardous)
Paper—janitorial/office
Green cleaning products
Solar power
Biodegradable food service disposables
Sustainable food (local/organic)
Renewable Energy Credits (RECs)

Wastes Generated:

Solid waste—landfill
Recycling
Lamps (controlled)
Electronic (controlled)
Batteries (controlled)
Solvents (hazardous)
Petroleum (hazardous)

Emissions Calculated:

Carbon (CO₂)
Nitrous Oxides (NO_x)
Sulfur Dioxide (SO₂)

will handle trash and the sorting of recoverables in the public areas, or at least a portion of them, as opposed to just tackling them back-of-house.”

STAPLES Center had a public recycling program in 2005, but the public participation rate was so low that the labor and materials cost of maintaining separate bins was detracting from the more effective back-of-house recycling program. STAPLES Center made the hard decision to focus on behind-the-scenes recycling, explains Kropp. “Our primary efforts right now are back-of-house before and after events, where we do source separation with our operations staff, our

food concessionaire Levy Restaurants, and our community recycling partner, the Los Angeles Conservation Corps.”

“We do a lot of source separation—that’s the key to our diversion here,” says Kropp. “Our operations team coordinates the collection of cardboard from all of our tenants, vendors and office staff as well as a robust lightbulb and battery collection that even encourages staff to bring them in from home. For cans and bottles, we allow both Levy Restaurants and the Los Angeles Conservation Corps to take the deposit value [of the recyclables], but we take the diversion rate. Levy Restaurants does sorting in kitchens and behind the bars, and the Los Angeles Conservation Corps will do post-event sorting from the bowl, where, quite frankly, people don’t pick up after themselves, and that’s the time to capture those recoverable pieces: a cardboard popcorn bin, an Aquafina bottle, an aluminum can. We’ll have about eight people here from the Los Angeles Conservation Corps, and every night we’ll focus on a specific recoverable.”

In 2011, the arena started a composting program in its kitchens. “Our food composting program with Levy Restaurants has taken an incredible amount of weight out of our waste stream, saving a lot of money,” says Kropp. “It’s a back-of-house program in two of the main kitchens, where most of the food is prepared. It just takes training with the back-of-house chefs, new chefs and kitchen staff. So when they’re cutting up a watermelon, waste is going into green receptacles, which are transferred to the loading dock and picked up for composting.” The arena has already seen success with this program; in April 2012, for example, it diverted 4.78 tons of food waste from going into the trash.

“The next three steps are linking together the public recycling and composting with fan engagement and sponsorship engagement,” says Regan. “AEG’s partnership with Waste Management is key to addressing these needs and engaging fans in the program. Their sponsorship includes a recycling information kiosk and a Random Acts of Recycling fan engagement program to reward fans for recycling at games and events.”

Engaging fans is “certainly a primary element we have talked about,” Kropp adds. “In-arena incentives are one tactic we are introducing to get fans involved. You know, if you take the recoverable item back to the refreshment stand, we have a designated receptacle and maybe we give you a discount off your next Coke. Some kind of incentive to really make the fan think twice about just throwing [a recyclable item] in a trash bin.”

“We need to cross over into where every guest at STAPLES Center will know that our operations are green,” adds Regan. “ISO was good at getting all of our employees engaged. But I really think that if we put a full-court press on engaging the public in our recycling program, and eventually public composting, we’ll achieve a new level of community pride in the venue.”



LESSONS FROM THE FIELD

WITH PROPER MAINTENANCE, WATERLESS URINALS SAVE WATER AND MONEY:

In 2008 STAPLES Center became one of the first large arenas to install waterless urinals, and it has had great success with them. “We have people calling us saying, ‘We’ve heard good things (and/or bad things) about waterless urinals; we’ve heard they smell, etc.,’” Pottorff says. “And we always tell them the same thing: If you do the maintenance correctly, you won’t have any problems.” Making sure the pipes get flushed out and cartridges get replaced routinely is key, explains Kropp, “and we do that quarterly, and religiously.”

DEVELOP AN ENERGY MANAGEMENT SYSTEM TO ORGANIZE YOUR EFFORTS:

An environmental management system helps to streamline data around sustainability initiatives and provides comprehensive documentation of your progress toward environmental goals. “As a result of the EMS, there was a whole new level of awareness,” says Kropp. “OK, so we get that battery bucket in place, then where else are batteries being used? We set up additional buckets and communicate that to staff. Then we document where the batteries go when we’re done with them. So when we get audited—‘These batteries were taken at this point and this time, and disposed of properly, taken by this particular entity’—that whole process is documented,” he adds.

AN EMS CAN PAVE THE WAY FOR LEED: The extensive documentation collected by an EMS can also be helpful with potential building certifications down the road. “That’s kind of the reason we went that route; we knew ISO 14001 was a little bit easier to get than LEED, but also a step toward LEED—it kind of paves the road,” says Kropp. “I generally like to describe an EMS as the program for your staff and LEED as the program for your building,” adds Regan. “I believe they are complimentary, and although they can exist separately, I think an EMS helps people who are pursuing LEED EBOM.”

AN ISO CERTIFICATION ENHANCES THE LEGITIMACY OF YOUR PROGRAM TO THE PUBLIC: “Transparency is essential for the success of any corporate environmental program,” said Lee Zeidman, senior vice president and general manager of STAPLES Center, Nokia Theatre and L.A. Live, when the ISO certification was granted. “By making our environmental management systems available for third-party review, AEG and STAPLES Center are backing up our 1Earth commitments with aggressive actions to limit our environmental footprint.”¹

ENDNOTES

1 “STAPLES Center Awarded Environmental Management System Certification,” PR Newswire (December 14, 2010). www.prnewswire.com/news-releases/staples-center-awarded-environmental-management-system-certification-111846539.html (accessed July 19, 2012).