NRDC REPORT

SEPTEMBER 2012
R:12-08-A

GAME CHANGER

HOW THE SPORTS INDUSTRY IS SAVING THE ENVIRONMENT

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Acknowledgments

Many people contributed to the success of this work. The Natural Resources Defense Council and the authors would like to acknowledge the Wendy and John Neu Family Foundation, The Merck Family Fund, Jenny Russell, Fred Stanback, Beyond Sport, Frances Beinecke, John Adams, Robert Redford, Bob Fisher, Wendy Neu, Josie Merck, Alan Horn, Peter Morton, Laurie David, George Woodwell, Jonathan F.P. Rose, Dan Tishman, Peter Lehner, Phil Gutis, Alexandra Kennaugh, Jenny Powers, Lisa Goffredi, Daniel Hinerfeld, Jack Murray, Robert Ferguson, Nikki Verhoff, Mark Izeman, Eric Goldstein, Kate Sinding, Rich Schrader, Joel Reynolds, Ralph Cavanagh, Jonathan Kaplan, Dana Gunders, David Pettit, Adriano Martinez, Lynne Shevlin, Lisa Busch, Josh Mogerman, Liz Heyd, Amrita Batra, Carlita Salazar, Justin Courter, Dylan Gasperik, John Cavanagh, Martin Tull, Sara Hoversten, David Muller, Jason Twill, Lisa Jackson, Stephanie Owens, Peter Murchie, Val Fishman, Kayla Walker, Tiffany Meyer, Margie Gardner, Patrick Nye, Allan H. (Bud) Selig, John McHale, Tim Brosnan, Scott Jenkins, Mike Morris, Neil Boland, Sarah Leer, Paul Hanlon, Kate Gibson, Jacqueline Parkes, Bob Nutting, Dennis DaPra, Jeff Podobnik, Sissy Burkhart, Larry Lucchino, Jonathan Gilula, Katie Haas, Kathleen Harrington, Joe Abernathy, Brad Mohr, Joe Myhra, John McEvoy, Gary Glawe, Dave Horsman, Mary Ann Gettis, Andrea Carter, Alison Sawyer, Alfonso Felder, Jorge Costa, Shana Daum, David Montgomery, Lara Potter, Stan Kasten, George Valerga, Linda Pantell, David Stern, Adam Silver, Kathleen Behrens, Lisa Quinn, Alexandra Olsen, Erin Schnieders, Maggie Carter, Justin Zeulner, Steve Scott, Jackie Ventura, Lorrie-Ann Diaz, Charles Freeman, Greg Poole, Scott Manley, Ken Sheirr, Sarah Joseph, Tad Brown, Hai Duong, Nelson Luis, Barry Henson, Jennifer Carlson, Gary Bettman, Bernadette Mansur, Craig Harnett, Mike Richter, Paul LaCaruba, Omar Mitchell, Bryan Leslie, Xavier Luydlin, Angelo Ruffolo, Michael Doyle, Brian Magness, Gordon Smith, Lauren Kittelstad, Billie Jean King, Ilana Kloss, Venus Williams, Bob Bryan, Mike Bryan, Anna Isaacson, David Krichavsky, Darryl Benge, Ovie Mughelli, Don Smolenski, Jan Greenberg, Katie Proudman, Katie Pandolfo, Jennifer Regan, Michael Roth, Bill Pottorff, Samuel Kropp, Michael Lynch, Brandon Igdalsky, Robin Raj, Joe Khirallah, David Van't Hof and Dale Clearwater.

The Green Sports Alliance would like to thank our members, the Bullitt Foundation, the U.S. Environmental Protection Agency, the Natural Resources Defense Council and the many other partner and sponsor organizations that provide technical assistance and funding to support the mission of the Alliance and enable our success.

For more information about greening sports, visit www.nrdc.org/sports or www.greensports.org.
Download this report at www.nrdc.org/game-changer.

About NRDC

NRDC (Natural Resources Defense Council) is a national nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at www.nrdc.org.

NRDC's policy publications aim to inform and influence solutions to the world's most pressing environmental and public health issues. For additional policy content, visit our online policy portal at www.nrdc.org/policy.

About Green Sports Alliance

Green Sports Alliance is a non-profit organization with a mission to help sports teams, venues and leagues enhance their environmental performance. Alliance members represent over 100 sports teams and venues from 13 different sports leagues.
Please visit www.greensportsalliance.org for additional information.

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Cover photo © Microgrid Solar

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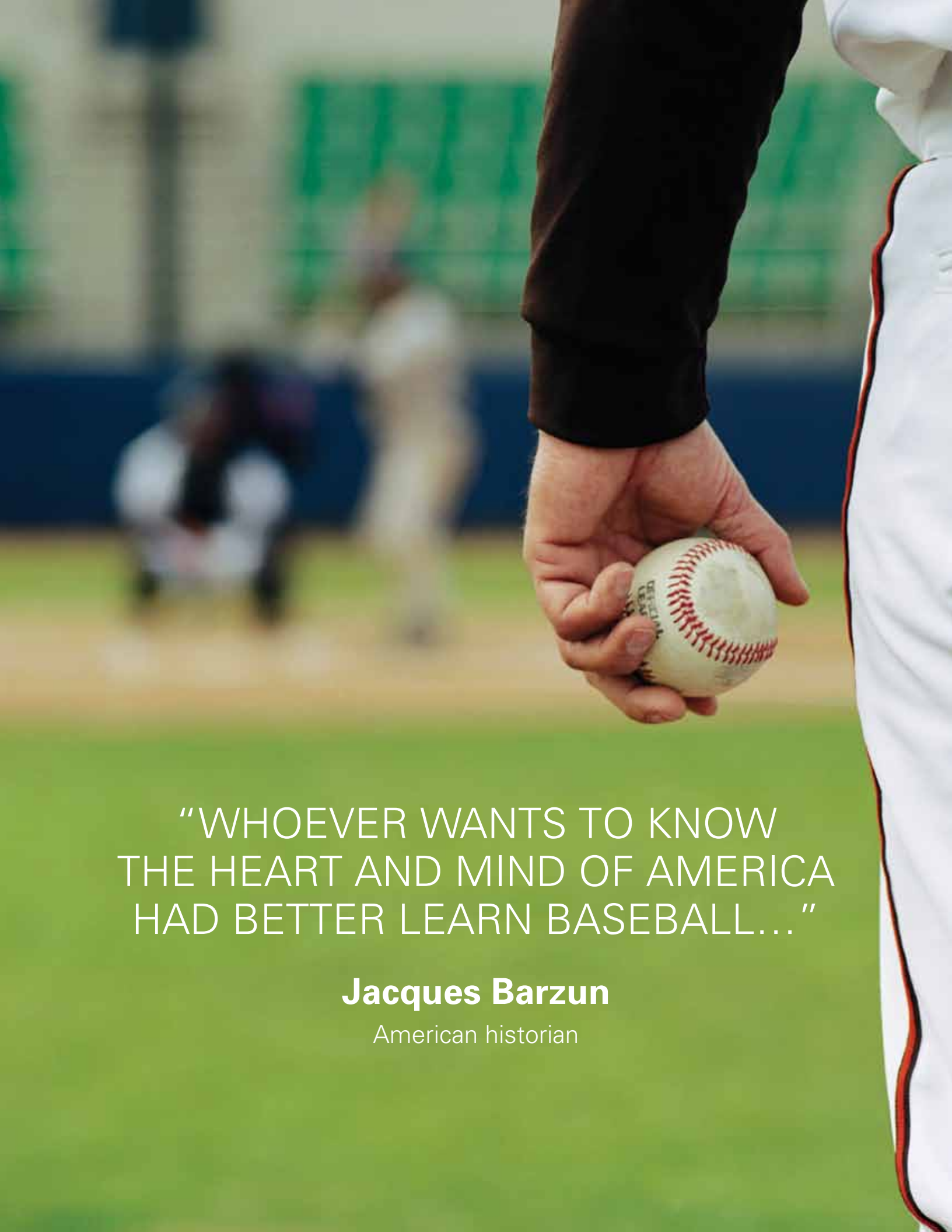
This report is dedicated to
Robert Redford,
NRDC Trustee,
and father of the sports greening movement.



“WHOEVER WANTS TO KNOW
THE HEART AND MIND OF AMERICA
HAD BETTER LEARN BASEBALL…”

Jacques Barzun

American historian

Having been honored to serve as the Commissioner of Major League Baseball since 1992, I have often said that our game is a social institution with enormous social responsibilities. I still often marvel at the examples of Jackie Robinson, whose courage generated what remains our game's proudest and most powerful moment, and Roberto Clemente, whose spirit of humanitarianism shines a light on the difference that one person can make for those in need.

Forty years after Jackie Robinson and Roberto Clemente left us all too soon, their vibrant legacies continue to remind us of the impact that our game, as a common thread for so many, can have on important social issues. One of those issues is care for our environment. As an outdoor game played in fields, parks and backyards across the country and around the globe, our sport is closely aligned with the environment. I am proud that Major League Baseball has taken substantial action to do its part to protect it.

In 2006, I was introduced to the Natural Resources Defense Council (NRDC) by Bob Fisher, a principal partner of the Oakland Athletics and an NRDC trustee. MLB then began an alliance with NRDC to identify and promote best sustainable operating practices and to coordinate and share existing practices by the Clubs. Soon thereafter, Major League Baseball conducted a survey of all 30 of our Clubs, documenting the broad range of sound environmental practices that they have implemented in their communities. Guided by NRDC, Major League Baseball used the results to develop an environmental stewardship program—the first designed by a professional sports league. Since then, MLB has assembled operations guides tailored to each Club, incorporated environmentally sensitive practices into the World Series and All-Star Week, and created a software program to collect and analyze stadium operations data. These efforts have helped us formulate a series of best practices, which have reduced the environmental footprint of our 30 Clubs.

In 2011, more than 73 million fans attended Major League games. In addition to recycling paper, cans and bottles at its 2,430 regular-season games each year, Major League Baseball has a significant global platform from which its fans can be educated about the importance of environmental stewardship. Our Clubs have helped instill in fans the practical steps they can take in order to make a difference. Collectively, the potential environmental reduction that can be achieved is meaningful.

While there is more work to be done, it is my great hope that the work of Major League Baseball and its Clubs can stand as an example and inspire others to join in this vital effort. Major League Baseball pledges to continue to devote its time, energy, influence and resources toward making lasting contributions to our fans, their communities and our society as a whole.

In my two decades as Commissioner, I have seen our sport take important strides forward on this essential issue. Environmental stewardship resonates with all of us who love baseball and seeing it played on green grass and under blue skies. As we strive to fulfill our social responsibilities, the national pastime will continue to protect our natural resources for future generations of baseball fans and set an example about which they can be proud.

Major League Baseball Commissioner Allan H. (Bud) Selig

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EXECUTIVE SUMMARY

The professional sports industry includes some of the world's most iconic, inspirational and influential organizations. In a cultural shift of historic proportions, the sports industry is now using its influence to advance ecological stewardship. North America's professional leagues, teams and venues have collectively saved millions of dollars by shifting to more efficient, healthy and ecologically intelligent operations. At the same time, the sports greening movement has brought important environmental messages to millions of fans worldwide. Sport is a great unifier, transcending political, cultural, religious and socioeconomic barriers. It also wields a uniquely powerful influence, both cultural and economic, that provides much-needed leadership in sustainable practices and, in so doing, promotes a nonpolitical public commitment to environmental protection.

This report provides a collection of never-before-assembled case studies of the sports industry's most prominent and successful greening initiatives from across North America. In compiling this information, our goal is to celebrate the sports industry's growing embrace of environmental stewardship as more and more sports leagues, teams and venues invest in energy efficiency, water conservation, recycling, renewable energy, safer chemicals and fan engagement focused on remedying some of our most pressing environmental problems. A principal objective of this report is to educate sports professionals, their supply chains and millions of fans about the business case for greening, from achieving cost savings and enhancing brands to developing new sponsorship opportunities and strengthening community ties.

The sports greening success stories featured in this report provide valuable lessons for organizations of all types, whether they are involved with the sports industry or not, highlighting what teams, venues and league jewel events are doing to protect our planet and educate their fans. Each of the team and venue case studies includes four sections that help explain the greening process: (1) Why go green: what motivated teams and venues to start greening? (2) Where to start: how did teams and venues begin, who was involved, and which greening initiatives were investigated first? (3) Challenges overcome and ongoing: challenges teams and venues faced, tactics they used to meet these challenges, and hurdles they still face; and (4) Lessons from the field: important lessons from team and venue experiences as they implemented their green initiatives.

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PROFESSIONAL SPORTS IS PROVING THE BUSINESS CASE OF GOING GREEN

- ★ **Greening provides direct financial savings:** In this report you will learn about the team that saved approximately $1.5 million in utility costs (electricity, natural gas, water and sewer service) from 2006 to 2011 by reducing natural gas use by 60 percent, electricity use by 30 percent and water use by 25 percent. In this report you will also learn precisely how much it cost one major arena in the southeast to achieve LEED Certification.
- ★ **Greening attracts sponsors:** In this report you will learn about the venue that saved $1.6 million in a single year due to its greening efforts; it also attracted about $1 million in new corporate sponsors that aligned with the greening efforts.
- ★ **Greening provides competitive advantage to attract tenants and entertainment clients:** This report includes a profile of the venue where being environmentally conscious has significantly improved brand image and provided a point of market differentiation, which has attracted new clientele and corporate partners. For this venue, going green has provided a platform to attract entertainers who want to play in green venues.
- ★ **Greening enhances the fan experience:** In this report you will learn about one team's efforts to post recycling signs around its venue and provide recycling bags for tailgaters, an initiative that resonates so much with the community that fans roll up their sleeves to help hand out and fill up the recycling bags, which are later picked up by the team.
- ★ **Greening strengthens community ties:** Aside from the operational benefits of going green, this report will tell you about the team that says it has received only positive feedback about its greening initiatives, including thousands of favorable media articles, local community achievement awards and immense fan applause, proving these efforts are worthwhile beyond the business case by representing the core values of the surrounding community. You will also learn about the largest public recycling event in the history of New York City, sponsored by Major League Baseball.
- ★ **Greening builds local economic growth:** You will also learn about one team's investment in onsite renewable energy, which not only directly benefits the environment but also contributes to local clean-tech jobs and helps to boost the local economy by stimulating the state's clean-tech manufacturing industry.

Key findings from the case studies include these:

- All Commissioners of professional sports leagues in the United States have made commitments to environmental stewardship and are actively encouraging the teams in their leagues to incorporate sustainable measures into their operations.
- 15 professional North American stadiums or arenas have achieved LEED green building design certifications, 18 have installed onsite solar arrays, and virtually all have developed or are developing recycling and/or composting programs.
- Among all sports leagues, Major League Baseball has the best-developed environmental data measurement program, followed by the National Hockey League and the National Basketball Association.
- Of the 126 professional sports teams in the five major professional North American leagues, 38 teams have shifted to renewable energy for at least some of their operations, and 68 have energy efficiency programs.
- All of the large sports concessionaires, that collectively feed tens of millions of people each year, have developed environmentally preferable menus for at least some of their offerings.
- All Jewel events, including the World Series, the Super Bowl, the Stanley Cup playoffs, the NBA Playoffs and Finals, the MLS Cup, the US Open Tennis Championships and all of the league All-Star Games, now incorporate greening initiatives into their planning and operations.
- All leagues educate their fans about environmental issues, in particular the need to recycle and to reduce energy and water use.

Perhaps most important, millions of pounds of carbon emissions have been avoided, millions of gallons of water have been saved, and millions of pounds of paper products are being shifted toward recycled content or eliminated altogether.

Certainly much work remains to be done, but it is heartening to note that teams and leagues across North America are implementing meaningful changes and educating tens of millions of fans about environmental stewardship. Collegiate athletics, alongside minor leagues, high school athletics and other organized youth sporting events, are the next frontier for the sports greening movement. Many college athletics departments nationwide have already undertaken impressive environmental initiatives, from LEED-certified facilities and onsite solar arrays to recycling challenges between schools. Colleges are just beginning to tap into the enormous potential to benefit their bottom line and engage their huge communities of sports fans on issues of environmental stewardship.

©MLB Photos/ Tim Parker

THE SPORTS INDUSTRY OFFERS THE POTENTIAL FOR UNPARALLELED OUTREACH TO MILLIONS OF FANS AND BUSINESSES VIA THE SCREENING OF ENVIRONMENTAL PUBLIC SERVICE ANNOUNCEMENTS (PSAS) AND OTHER FORMS OF FAN ENGAGEMENT. FOR EXAMPLE, TO DATE THE SPORTS GREENING PSAS THAT NRDC CREATED IN PARTNERSHIP WITH THE NBA, THE NHL, MLB AND THE USTA HAVE REACHED AN ESTIMATED 45 MILLION PEOPLE VIA BROADCAST TELEVISION AND IN-ARENA SCREENINGS. SEE THESE VIDEOS ABOUT THE IMPORTANCE OF ENVIRONMENTAL STEWARDSHIP AT WWW.NRDC.ORG/GAME-CHANGER.

The motivation for sports to engage in greening is simple. The games we love today were born outdoors, and without clean air to breathe, clean water and a healthy climate, sports would be impossible. In fact, nature is the ultimate source of all economic value. No commerce or culture is possible without clean air and water; fertile topsoil; a chemically stable atmosphere; raw materials for food, energy and medicine; or the natural processing of waste by the millions of species inhabiting our soil, water and air. It is the availability of these wells of natural capital that makes sports and other types of human activities possible. Business leaders must devote the same level of effort to keeping this natural capital intact that they devote to more traditional capital. The sports industry's increasing demand for ecologically better products can help industrial leaders understand and embrace that goal.

This report is a celebration of the sports industry's impressive environmental accomplishments to date, of the extraordinarily important work being done largely behind the scenes, out of the spotlight. This document confirms that going green is savvy business, enabling teams and venues to cut operating costs, strengthen corporate branding, attract sponsors and enhance the fan experience, while providing many environmental benefits. Ideally, the practical examples and expert recommendations included in this report will inspire many more sports teams, and the businesses that service them, to follow their good example. The lessons from those who manage sports facilities will help us move toward ecological stability, crucial for social and economic prosperity. Current and future generations depend on these efforts, and on the prospect that others the world over will notice and emulate this industry's inspiring greening work.

CHAPTER 1: WHY GREENING SPORTS MATTERS

The sports industry's growing embrace of energy efficiency, renewable energy, recycling, water conservation, safer chemicals and healthier food is educating millions of fans about the importance of protecting the environment and natural resources on which we all depend. Through their leadership on the field, court or rink, professional and collegiate sports—and their sponsors—are showing their many fans practical, cost-effective solutions to some of our planet's most dire ecological issues.

Sports leagues, teams and venues are adopting environmental practices to improve their operations and save money while using their unique cultural and economic influence to demonstrate to thousands of businesses and millions of people how to be better environmental stewards. Yet, despite the impressive strides this industry is already taking to protect the environment, the sports greening movement is just beginning. The potential is enormous for professional sports to help move society toward more sustainable practices and lead our economy to a stronger future.

It goes without saying that sports are a hugely popular, economically influential industry. And while team loyalties vary and sports management practices differ, there is one thing we can all agree on: Sports belong to no particular political party. Consequently, perhaps no other industry is better suited to confirm that environmental stewardship has become a mainstream, nonpartisan issue. Hundreds of millions of people of all political, social, religious and economic backgrounds watch sporting events each year, and the global supply chain of the sports industry includes the largest and most influential corporations in the world. In fact, while only 13 percent of Americans say they follow science, 61 percent identify themselves as sports fans.[1]

Consider how culturally influential sports can be: Jesse Owens in 1936, debunking the Aryan supremacy myth. Billie Jean King beating Bobby Riggs in the first female-versus-male professional tennis match, a big step toward pay equality. Passage of Title IX, leading to financing for women's athletics. Muhammad Ali's conscientious objection to the Vietnam War and his role as a spokesman for civil rights. Magic Johnson's openness about his HIV/AIDS infection, which helped to destigmatize that illness. Jackie Robinson breaking the race barrier in Major League Baseball.

Consider as well the combined visibility and market influence of the Super Bowl; the World Series; hockey's Stanley Cup playoffs and Winter Classic; the NBA playoffs and finals; the US Open Tennis Championships; the pro basketball, baseball, hockey and soccer all-star games; and international soccer's World Cup competition. Now consider the value of mobilizing that combined influence to promote greening.

Greening is the process of reviewing operations and procurement policies with an eye toward reducing environmental impacts. It is an ongoing enhancement process that all businesses need to engage in to advance sustainability. The ecological threats we face are real. We have a narrowing window of opportunity in which to limit the ecological damage we are causing, to reduce global warming impacts, to save our oceans and the fisheries they support, and to protect biodiversity and our last remaining wild spaces.

If the sustainable economy does not exist, then it needs to be built. Overwhelmingly it will be built by the private sector. Government, of course, has an irreplaceable role to play in building the infrastructure needed for commerce and culture. Government must also encourage ecologically intelligent private sector investments through incentives and smart regulations. To date, however, government has failed to provide incentives and regulations that will adequately encourage sustainable investments at the scale needed. Indeed, most government incentives and regulations continue to encourage and subsidize ecologically ignorant manufacturing.

There is no single business undertaking or law that can solve our many ecological problems. Rather, it will require countless contributions from every corner of society. However small our day-to-day actions may seem, our collective purchases add up to meaningful regional and global impacts. Most individuals and businesses can do only relatively small things, whether it's buying products made with recycled content, purchasing renewable energy, driving a fuel-efficient car, or conserving water. What is clear, however, is that everyone has to do something to address the ecological pressures we collectively face. And the many small ecological initiatives being implemented throughout the world of sports are adding up, offering us the hope that we can turn current ecological trends around.

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Awareness is the first step in healing. A cultural shift toward environmental awareness is required to effectively address the serious ecological problems we face as a planet. We need to change the way we think about our relationship to the planet that gives us air to breathe and water to drink.

Lessons from previous cultural shifts that have moved our society forward suggest that the change needed today in our thinking about the environment will not be led by government. The Civil Rights Act did not become law because Congress led the way on race relations. The Vietnam War did not end because Congress led the way on defunding United States participation in that conflict. In each case, government did not lead on the reforms needed to address these issues; it followed. Congress was forced to act by a cultural shift in public opinion.

The same is true about environmental stewardship. Clearly, government is not leading the way in addressing the urgent issues of global climate disruption, biodiversity loss and so many other ecological threats. We must encourage government to respond to these threats, and in order to do that, we need to promote a shift in how Americans view their relationship to the planet. We need business leaders to enhance how business is done, and cultural leaders to help expand society's expectations about sustainability.

To instigate this, few sectors can be as influential as the sports industry. It is clear that bringing environmental information to our cultural leaders is as important as bringing that information to our political leaders. Indeed, perhaps it is more important. Sports are the ultimate cultural unifier. If we want to change the world, we need to bond through our common connections rather than emphasize our differences.

As of this writing, 15 professional stadiums or arenas have achieved LEED green building design certification, 18 have installed onsite solar arrays, and 68 have energy efficiency programs. Some 38 professional teams have shifted to renewable energy for at least some of their operations. Millions of pounds of carbon emissions have been avoided, and millions of pounds of paper products have been shifted toward recycled content or eliminated altogether. Recycling and composting programs have been or are being developed at virtually all professional stadiums and arenas. The large sports concessionaires that collectively feed tens of millions of people each year have all developed environmentally preferable menus for at least some of their offerings. Certainly much work remains to be done, but it is heartening to note that meaningful changes are being put into place throughout sports and that tens of millions of fans are being educated about environmental stewardship by teams and leagues around the world.

There is a reason some of the largest industries on earth pay millions of dollars to affiliate with professional sports. They know that sports offer an effective way to influence the culture of the marketplace. All industries meet on a football field. The energy, water, chemical, auto, textile, plastics, and food industries are all suppliers or sponsors of professional sports. The sports industry is among the largest economic sectors in the United States, generating more than $400 billion in economic activity annually.[2]

Sports can be a powerful engine for social change. Now, environmental stewardship is starting to benefit from that influence as teams and venues have begun to inform their fans about their commitment to environmental protection, even as they save millions of dollars by integrating environmentally progressive features into their facilities and operations, making their organizations more financially viable and ecologically responsible.

ENDNOTES

1 13 percent of Americans following science closely: www.nsf.gov/statistics/seind10/c7/c7s1.htm. Sports followers: Marist Institute for Public Opinion, "Marist Poll," Dec 15, 2011.

2 $400 billion sports industry: Plunkett's Sports Industry Almanac 2010, Plunkett Research Ltd. (2010) Accessed August 20. http://www.plunkettresearch.com/sports-recreation-leisure-market-research/industry-and-business-data/trend.

CHAPTER 2: THE ECOLOGICAL BASIS UNDERPINNING THE GREENING OF SPORTS

To date, humanity's chief involvement with the environment has been to exploit its great store of natural resources for short-term economic gain. People are now the greatest threat to life on earth and the future well-being of society, yet we are also the best candidates for dramatically improving our planet's outlook. Promoting more sustainable development and consumption is a positive alternative to environmentally ignorant development and economically unsustainable growth. Most important, we need to eliminate the social and economic conditions that encourage individuals and industries to behave in environmentally disruptive ways.

ENERGY EFFICIENCY MEASURES AND SOURCING OF RENEWABLE ENERGY CAN HELP CURB CLIMATE CHANGE

Since the end of the Second World War, we have spewed about 1 trillion tons of global warming pollution into the atmosphere.[1] Each day we are adding about 90 million tons of global warming pollution to our air. These emissions are already affecting communities and ecosystems across the United States—and across the globe:

- Some 24,000 heat records were broken across the United States in the first six months of 2012.[2]
- Nine of the 10 hottest years ever recorded have been experienced since 2000.[3]
- The warmest spring on record since 1895, when temperature recordkeeping began, was in 2012.[4]
- Record droughts are ravaging the critical food-growing regions of our nation and the rest of the world.

Using clean, renewable energy is a matter of protecting public health, strengthening national security by reducing our reliance on foreign energy sources and ensuring ecological stability.

WATER EFFICIENCY MEASURES CAN HELP SHORE UP ACCESS TO SAFE, FRESH WATER

Desertification and water scarcity will rival sea level rise as one of the most serious consequences of climate disruption. In the United States, our fastest-growing regions—Arizona, New Mexico, Nevada, Utah, and Southern California—have become our driest, and freshwater shortages are a major concern:

- The flow of the Colorado River is at its lowest level since measurements began more than 90 years ago. (Thirty million people in seven states and parts of Mexico depend on the Colorado River for water.)
- The level of water in the Lake Mead reservoir behind the Hoover Dam on the Colorado River, the largest reservoir in the United States, has not been this low since 1937, when it was being filled for the first time.[5] The reservoir, which supplies virtually all the water used by Las Vegas, is more than half empty, will never be full again, and has a 50 percent chance of running dry by 2021.[6]

Access to safe, fresh water is a global concern. In southern Spain, farmers and developers are so desperate for water that water siphoned from illegal wells is being sold on the black market.[7] In the developing world, almost 3 billion people, or about half of the world's population, already live in areas of severe water stress, and an additional 1 billion people are approaching that situation.[8] Almost one-quarter of the world's population, 1.6 billion people, face water shortages caused by a lack of necessary infrastructure to carry water from rivers and aquifers.[9] Sadly, the lack of safe drinking water and sanitation is the single largest cause of death in the world, contributing to the deaths of 5 million people a year[10] and about 4,000 children every day.[11]

SADLY, THE LACK OF SAFE DRINKING WATER AND SANITATION IS THE SINGLE LARGEST CAUSE OF DEATH IN THE WORLD, CONTRIBUTING TO THE DEATH OF 5 MILLION PEOPLE A YEAR AND ABOUT 4,000 CHILDREN EVERY DAY.

Source: "World Water Day 2005: 4,000 Children Die Each Day From a Lack of Safe Water." UNICEF. UNICEF (20 March 2005). Accessed 23 July 2012. http://www.unicef.org/wash/index_25637.html.

The situation is expected to worsen. By 2025 half of the planet, about 4 billion people, will live in areas experiencing severe water stress, 1.3 billion will be living with moderate water stress, and 866 million will face low-level water stress.[12] By 2025 only 26 percent of the world population will be living in areas with no water stress. According to the U.K. Meteorological Office, with no mitigation of climate change the severe droughts that now occur once every 50 years may occur as often as every two years by 2100.[13]

As the world population grows, water demand will increase for human consumption; for the cultivation of food, fiber and industrial crops; for bio-plastics; for livestock and fish; and for recreation. In fact, food and feed crop demand alone is expected to nearly double the demand for water in the coming 50 years.[14] By 2017 more than half of all agriculture will take place in the developing world, where many countries are already water-stressed. Some of these nations are unprepared to manage and regulate the growth in industrial agriculture they are already experiencing and the risks posed by widespread application of genetically modified seeds.

ENVIRONMENTALLY INTELLIGENT PRODUCTION, PROCUREMENT, USE AND DISPOSAL MEASURES CAN HELP STEM HABITAT AND BIODIVERSITY LOSS

The biosphere is a narrow, 10-mile band of life that stretches from about 5 miles above the surface of the earth to about 5 miles below the surface of the sea. It is the only place where life has ever been discovered. One of the most daunting challenges that we face in the 21st century is preserving the functional integrity of the biosphere—in other words, the ecological conditions that make life possible.

We are not effectively protecting the habitats that support life on earth. Of all forms of habitat destruction, the most consequential is the conversion of terrestrial green spaces. Each year, in the United States alone, 3.2 million acres of open green space are paved over. This translates to an acre of wetlands destroyed every minute. California has lost more than 90 percent of its original wetlands, New York has lost 60 percent, Florida more than 50 percent.[15] The result is habitat loss and fragmentation, which has pushed many species, such as the Florida panther, to the brink of extinction.

We are not effectively protecting the diversity of life on earth. Instead we are destroying a majority of the world's species, including some whose existence we may not even be aware of. In fact, biologist E. O. Wilson estimates that we are wiping out 1 species every 20 minutes, or about 70 per day.[16] In the history of species extinction, this current period of mass extinction is distinguished by the fact that people are the principal cause.

And this is occurring all over the world. Since 2006, the overall number of critically endangered species globally has grown nearly 15 percent, reaching 3,427 species in 2010.[17] Global mean species abundance is projected to decrease by 10 percent from 2000 to 2030,[18] including tropical bird species, which are declining at rates far higher than previously estimated. Before human impacts—essentially prior to 1800—the extinction rate for tropical birds was one for every 1 million species per year. Now there are 100 extinctions per million species per year. And if current deforestation trends continue, the United Nations Environment Programme (UNEP) estimates that we could reach 1,500 extinctions per million species per year by the end of the century.[19]

AN ACRE OF WETLANDS IS DESTROYED EVERY MINUTE IN THE UNITED STATES.

Changing the sports industry supply chain—for instance, by sourcing recycled paper products—can not only bring results in the sports sector but also create a ripple effect well beyond sports, inspiring other sectors to make long-lasting changes to the ways they produce, secure and use natural resources.

WASTE MANAGEMENT MEASURES SUCH AS REDUCTION AND RECYCLING CAN HELP CONSERVE VALUABLE RESOURCES AND CURTAIL POLLUTION STREAMING INTO OUR OCEANS

The need to reduce waste and increase recycling efforts is urgent. The United States produces between 14 billion and 16 billion tons of waste each year. This includes mining wastes, coal ash, oil and gas industry wastes, agricultural waste, food processing residue, medical waste, municipal waste, nuclear waste, incinerator ash, cement kiln ash, and so on.[20] If we assume that the United States produces one-third of all the wastes generated on earth (which is probably an overestimate), then global waste might total 45 billion tons annually from all sources—meaning that more than 450 billion tons of waste will have to be managed globally over the next decade.

Raw materials that have been laboriously collected and processed at great ecological cost are routinely discarded as waste after a very brief use. For instance, toilet paper, some of which is made from rare forest trees, is discarded after less than five seconds of use. And yet, more than 90 percent of all toilet paper bought in the United States each year has no recycled content in it. Products at the end of the consumer chain that cannot be recycled, such as toilet paper, should not be made from primary fibers but from recycled fibers instead.

Because of underdeveloped recycling programs worldwide, we are treating the oceans like sewers. According to the United Nations, there are 46,000 pieces of plastic per square mile in the ocean. In the Central Pacific, there are up to 6 pounds of litter to every pound of plankton.[21] Marine biodiversity is vulnerable because of inadequate legal protections; according to UNEP, today's commercial fisheries will collapse within 40 years "unless urgent action is taken to bring far more intelligent management to fisheries north and south," such as the creation of more marine preserves.[22]

SMART PAPER PROCUREMENT PRACTICES CAN HELP CUT DOWN RATES OF DEFORESTATION

The need to reduce paper use and move paper products to high post-consumer recycled content is urgent. In fact, the timber-based pulp and paper industry may have contributed to more global and local environmental problems than any other industry in the world. Perhaps no industry has forced more species into extinction; destroyed more habitats; polluted as many streams, rivers, and lakes; and caused as many taxpayer dollars to be spent on wasteful and ecologically dangerous landfills and incinerators.

Only 10 percent of the world's forests are managed according to some sort of certification program that promotes sustainability, and illegal logging is rampant.

For example, in Indonesia, 40 percent of all timber harvesting in the biologically rich areas of the country is done illegally, and 3 to 5 hectares of forest are lost to illegal logging every minute.[23] Some of this winds up as disposable paper products, some as solid wood products used in homes and offices.

The practice of clearcutting severely undermines the earth's ability to store carbon dioxide (CO_2), which exacerbates climate change. For the past 20 years, we have been destroying tropical forests at a rate faster than one acre each second—and this pace of destruction continues today. Consequently, more than half of the world's tropical rainforests have been lost, and if current trends continue, less than 5 percent will remain by midcentury.[24] The burning of forests in the Brazilian Amazon is by itself responsible for half of the world's annual greenhouse gas emissions caused by deforestation.[25] Moreover, the logging, burning, mining and farming of forests account for one-fifth of the world's total carbon emissions from all sources.[26] That is more than the amount emitted by the entire United States from all sources[27] and more than the amount generated by all of the world's cars, trucks, airplanes and buses combined.[28]

The Organisation for Economic Co-operation and Development (OECD) reports that the pulp and paper industry is one of the largest consumers of freshwater among its member nations. As recently as 10 years ago, 11 percent of all water used by these nations went into making paper products.[29] The pulp and paper industry is the third- or fourth-largest industrial emitter of global warming pollution in industrialized countries, after the chemical and steel industries, and its CO_2 emissions are projected to increase by roughly 100 percent between 2000 and 2020.[30] Of all the wood harvested globally for industrial uses in 1999 (everything but fuel wood), 42 percent went to paper production, a proportion that was expected to grow by 50 percent by 2050.[31]

SMART FOOD PROCUREMENT MEASURES CAN HELP REDUCE FOOD LOSS

Every year, Americans throw out more than 25 percent of all the food available for consumption. All but about 2 percent of that waste winds up in landfills, where it causes methane gas emissions. According to the Department of Agriculture, recovering just 5 percent of that food waste could feed 4

million people each day. Recovering 25 percent of it could feed 20 million people each day.[32] Sourcing food locally and offering menu options that require fewer inputs will help reduce food loss and food waste. The large sports concessionaires that collectively feed tens of millions of people each year are increasingly giving unused food to food banks. That is a good start.

REACHING OUT TO THE FAN BASE CAN HELP SPUR A CULTURAL MOVEMENT

The sports industry's embrace of environmental stewardship is happening not a moment too soon—and is potentially transformative if it can not only save resources of a $400 billion industry but also reach out to its supply chains and fans.

Human medicines, biomedical research, and the production of food all depend on biodiversity. We are kept alive by insects, bacteria, fungi, plankton, plants and other organisms, but that fundamental truth is lost to most of us. For too long we have acted as if we are totally independent from nature, as if we could do without the life-giving services nature provides. As a consequence, we are casually and mindlessly disrupting what ecologists call "ecosystem services"; that is, the myriad ways that organisms interact with our environment to sustain all life on this planet, including human life. And, too often, political debates and strategies fail to steer us toward adequate ecological remedies.

The greening of sports, for all its anchoring in the prosaic details of day-to-day operations, is a profound response to the disavowal of humanity's essential relationship to the natural environment. Sports communicate many things, with good health and the overcoming of difficult obstacles being perhaps foremost among them.

How logical it is, then, for this global industry to embrace the daunting challenges of protecting the health of our biosphere and the health of the billions of people who depend on it. Some of the most notable and influential personalities in history have been athletes, beginning as far back as the first athletic competitions held in Olympia in 776 BC, the precursor to our modern games. Today, some of the brightest lights in sports are not those who star on the field, but those who operate the venues of sports and use its glory and influence for a common good, for the protection of nothing less than our global commons.

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A HOME TO EAGLES GIVES WINGS TO AN IDEA: NRDC AND SPORTS GREENING

In 2005, NRDC bypassed Washington and secured a groundbreaking agreement with the largest timber company in the Cumberland Plateau bioregion that transformed the way southeastern forests are managed. The Cumberland Plateau, stretching from Virginia to Alabama, contains some of the last remaining islands of intact native hardwood forests in the region. After grassroots groups asked NRDC to help preserve the plateau, we decided to use market pressure to change the way the paper industry does business. We researched which mills got their raw materials from native forests and approached their largest consumers. In support of this initiative, the Philadelphia Eagles football team, the Warner Music Group, and other buyers agreed to purchase paper from mills that use recycled fiber and do not convert natural forests to pine plantations. At the same time, NRDC mobilized its 1.3 million members to send messages to paper giant Bowater, the largest landowner on the plateau. The strategic combination of public and market pressure prompted Bowater to start talks with NRDC and by June 2005, the company agreed to stop clearcutting and converting hardwood forests and to stop buying pine fiber from forests converted after 2007. This victory, coupled with the initial work NRDC did to help green the home of the Philadelphia Eagles and the important suggestion by NRDC Trustee Robert Redford to engage in sports, led to a new major initiative at NRDC—greening sports.

2003

The greening of Lincoln Financial Field, home of the Philadelphia Eagles football team, was started. It was the first green renovation focused on a professional sports stadium and it remains among the most advanced examples today. The Natural Resources Defense Council (NRDC) served as a technical advisor on that initial sports greening project and helped develop a wide-ranging greening initiative that went well beyond merely limiting carbon emissions.

This work set the stage for future sports facility greening templates. There was no precedent for this type of work, but the ecological impacts chosen as the project's greening focus were obvious: energy use, paper products, water use, waste generation, the use of chemicals for cleaning, and the health and ecological attributes of the food. The initial greening work at Lincoln Financial Field incorporated the use of renewable energy, promoted recycling, instigated a shift to ecologically-superior paper products, and included the first-ever sports fan education initiative about environmental stewardship.

2004

SEPTEMBER

At the suggestion of NRDC Trustee Robert Reford, NRDC became the nation's principal environmental advisor to professional sports. NRDC's team, led by Allen Hershkowitz, began providing in-depth guidance about greener practices that reduce environmental impacts, helping many stadium and arena operators, and teams and leagues, realize that going green is also smart business.

2005

JANUARY

Building on the work at Lincoln Financial Field, NRDC developed the first league-wide greening collaboration with Major League Baseball (MLB) in 2005. To help spread the word about MLB's commitment to the environment, NRDC produced the first sports greening public service announcement, which helped the league inform all team owners and stadium operators about the many benefits of stadium greening.

2006-2007

Within the first 18 months of the MLB and NRDC greening collaboration, NRDC produced an online tool, The NRDC Greening Advisor, which provided location-specific greening advice for each MLB team.

2007

FALL

NRDC partnered with the National Basketball Association (NBA) to develop another excellent greening program supported by the league's Commissioner.

2008

APRIL

The NRDC Greening Advisor won the U.S. EPA's 2008 Environmental Merit Award and has since been expanded as a free, comprehensive environmental resource that has been distributed by league Commissioners to stadium and arena operators from all teams and leagues. www.greensports.org.

2008

SPRING AND FALL

NRDC and MLB work on greening the All-Star Game and World Series for the first time, an effort which continues through today.

2008

SPRING AND FALL

NRDC was contacted by tennis legend Billie Jean King who requested help with the greening of the US Open Tennis Championships, which take place at The Billie Jean King National Tennis Center in New York City. That led to the first-ever greening of the US Open in 2008.

2008

FALL

NRDC became an environmental advisor to the National Football League (NFL), encouraging that league to develop its green committee and data measurement related to its teams' environmental impacts.

2008

FALL

Shortly thereafter NRDC began establishing a greening program for the National Hockey League (NHL).

2009

FALL

NRDC became the principal environmental advisor to Major League Soccer (MLS)

2010

NRDC joined in 2010 with Vulcan Inc., the corporation owned by Microsoft co-founder Paul Allen, to found the Green Sports Alliance (the Alliance) in order to broaden and deepen the mushrooming greening trend across North American sports. The Alliance was anchored by Mr. Allen's three teams—the Seattle Seahawks, the Seattle Sounders, and the Portland Trail Blazers—as well as the Seattle Mariners, the Seattle Storm, and the Vancouver Canucks, representing six leagues. It was the first time that all the primary major sports leagues came together into a single organization to advance a social cause. From those original six teams based in the Pacific Northwest, in less than 2 years the Alliance has grown into a national collaboration of more than 100 teams and venues from 13 leagues.

Nothing else like the Alliance exists: this is an organization dedicated entirely to the promotion of ecologically intelligent practices in the world of sports. Through an annual conference, webinars, and the dissemination of information about better practices, the Alliance has evolved into one of the most influential organizations in the world of sports greening. The Alliance has also formed partnerships with The Stadium Managers Association, the International Association of Venue Managers, and the British Association for Sustainable Sport to integrate information about better greening practices into the work of those influential organizations.

2012

The greening of professional sports is now one of the most influential collaborations in the environmental movement, and one of the most productive NGO collaborations in the world of sports. The NRDC Greening Advisor has been developed for all major professional North American leagues. The NHL and the NBA have joined the MLB in rolling out league-wide programs to measure their facilities' energy and water use, waste generation and recycling, and paper use. And wherever measurement takes place, improvements follow.

CHAPTER 3: LESSONS FROM THE FIELD: CASE STUDIES OF HOW JEWEL EVENTS, LEAGUES, TEAMS AND VENUES ARE GOING GREEN

This report, the first of its kind, assembles the experiences and advice of leading sports experts who are successfully greening their facilities and operations. The case studies included in this report were selected because of the breadth of their greening programs addressing energy and water efficiency, waste, procurement, transportation, food and fan engagement. Although the case studies represent a wide range of professional sports leagues, teams, venues and events across North America, this report does not purport to be a comprehensive list of sports sustainability initiatives in the United States, nor does it rank sports greening programs.

Our hope is that these case studies serve as a basic framework for thinking about, planning and implementing sustainability efforts.

Profiles of five league-level jewel events include all-star games and major championships. Jewel events provide an opportunity for leagues to advance innovative environmental initiatives, encourage technical innovation and offer the public messages about the importance of greening to the league, to suppliers and to society more broadly.

Jewel event greening is often able to build on, or at minimum simply support, greening at the venue level. For example, sometimes recycling bins or recycling volunteers are added to supplement existing recycling efforts at a particular facility for a jewel event; ideally, these changes persist after the event is over.

Greening jewel events has also resulted in legacies from the event, both at the community level and at the league level. For example, at the community level, associated jewel event activities can include building or refurbishing local playgrounds or community centers, tree planting or other neighborhood improvement projects. At the league level, benefits can include insights about how to improve the next year's event, websites offering green tips for fans and public service announcements that can continue to be aired after the event.

Each of the 15 team and venue case studies includes four sections that help explain the greening process:

1. WHY GO GREEN?
The first section explains what motivated teams and venues to start greening.

2. WHERE TO START?
The second section explains how teams and venues began their greening work, who was involved and which greening initiatives they investigated first.

3. CHALLENGES: THOSE OVERCOME AND ONGOING
The third section describes challenges teams and venues face, what tactics they used to overcome these challenges and what problems they are still tackling.

4. LESSONS FROM THE FIELD
The fourth section outlines important lessons from team and venue experiences as they implemented their green initiatives.

Last, we also profile five emerging leaders in the construction of green sports venues, which have recently been LEED-certified or are currently pursuing LEED certification. This spotlights a rapidly growing trend toward a system-wide approach to greening and efficiency.

The case studies presented here offer a number of key takeaways. They provide strategies to help leagues, teams and venues decide why sustainability matters, who is responsible for it and how to go about implementing it. Although there is no single method for greening, the most successful greening operators in the sports industry use similar elements to implement an effective program (see Elements of an Effective Green Sports Program).

ELEMENTS OF AN EFFECTIVE GREEN SPORTS PROGRAM

- ★ Establish an internal Green Team leader supported by interested staff from the top to the bottom of your organization, and engage leadership as early as possible.
- ★ Engage your operational partners, vendors and community experts.
- ★ Set regular meetings for all stakeholders.
- ★ Get a facility-wide audit to track your waste generation and your use of energy, water and paper and monitor data carefully.
- ★ Identify resources available nationally and locally (both free and for hire).
- ★ Learn from your peers' green initiatives.
- ★ Write a green mission statement and set goals.
- ★ Make a list of greening ideas, both short- and long-term. Prioritize initiatives on the basis of return-on-investment, ecological urgency, feasibility, sponsor support and fan interest.
- ★ Develop a flexible implementation plan.
- ★ Establish a tracking system for measuring savings, progress and setbacks.
- ★ After implementing your plan, translate successes into easily understandable sound-bites for staff, fans, sponsors and other stakeholders.

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MAJOR LEAGUE BASEBALL ALL-STAR GAME

NRDC began work to green Major League Baseball's "jewel events" starting with the **2008 MLB All-Star Game** and related events in New York City, including the All-Star Game Red Carpet Show, the All-Star Concert in Central Park and the All-Star Game itself at Yankee Stadium.

The 2008 MLB All-Star Game Red Carpet Show featured the longest and greenest red carpet in history, winding up NYC's Sixth Avenue, made from 100 percent recycled fiber content and manufactured using 100 percent renewable energy from solar and wind sources. The 95,000 square foot carpet was produced at Bentley Prince Street's California manufacturing facility, which was the first in the country to receive a silver rating from the U.S. Green Building Council's Leadership in Energy and Environmental Design for Existing Buildings (LEED-EB). The carpet was also certified as an environmentally preferable product by Scientific Certification Systems (SCS). Through Bentley Prince Street's manufacturing processes, MLB avoided the use of 6,300 pounds of fossil-fuel-derived fiber and 162,000 gallons of water during the carpet's production. In addition, Bentley Prince Street also offset the carbon impact of the carpet by purchasing 480,000 pounds of Green-e certified emissions reduction credits. After the parade, Bentley Prince Street collected the carpet for recycling through its ReEntry 2.0 carpet reclamation program, avoiding landfill disposal for 45,000 pounds of carpet.

Recycling programs were incorporated into all 2008 MLB All-Star events. NRDC "Green Team" volunteers also collected more than 100,000 plastic bottles at the Bon Jovi All-Star Concert in Central Park, the largest public event recycling initiative in the history of New York City.

All 2008 All-Star Game events—including FanFest, the Home Run Derby, and the All-Star Game—were powered by energy obtained from 100 percent renewable wind power. This purchase of green power prevented an estimated 287 metric tons of carbon dioxide emissions, equivalent to the CO_2 emissions from the electricity use of 39.8 average American homes for one year. Vehicle travel in the All-Star Game Red Carpet Show and for MLB guests were offset by Green-e certified carbon offsets purchased from Bonneville Environmental Foundation.

MLB engaged fans at All-Star Game events with public service announcements that featured MLB players encouraging attendees to recycle at Yankee Stadium and handed out NRDC "eco-tips" wallet cards inside reusable bags made from 80 percent post-consumer recycled content.

Similar efforts have continued at subsequent MLB All-Star Games, as well as at other MLB events like the World Series. Following are examples of environmental initiatives at All-Star Games held from 2008 to 2012:

- **ENERGY:** MLB offsets most of the energy used at All-Star Games through purchases of Green-e certified RECs and/or certified carbon offsets. The 2011 All-Star Game, held at Chase Field in Phoenix, featured a solar pavilion that covers more than 17,000 square feet of the Chase Field plaza, which Chase Field and the Arizona Diamondbacks used to help educate fans about solar energy. In anticipation of the 2012 All-Star Game in Kansas City, the Royals and KCP&L installed 120 solar panels on either side of the CrownVision scoreboard in Kauffman Stadium; this renovation now represents the largest in-stadium solar array in any MLB facility.

- **RECYCLING/COMPOST:** MLB "Green Teams" collect recyclable cups and bottles directly from fans during the events at MLB All-Star Games, supplementing existing recycling programs. For the 2011 All-Star Game at Chase Field in Phoenix, Arizona, 100 new recycling bins were installed at the stadium for All-Star Week, and now reside permanently at Chase Field. Also in 2011, for the first time in the history of All-Star Games, food waste and food-soiled paper were collected for composting. The 2012 All-Star Game in Kansas City continued the composting initiative, collecting organic waste from food prep and suites for composting.

■ **TRANSPORTATION:** MLB staff, as well as players and their families, rode in Chevy Flex Fuel vehicles during the 2008 MLB All-Star Week. Hybrid buses comprised part of the fleet of buses that shuttled fans to All-Star events. MLB All-Star FanFest volunteers at the 2011 All-Star Game in Phoenix received complimentary METRO light rail passes to encourage the use of public transportation.

■ **PAPER:** Most paper products purchased for All-Star events (including invitations, tickets, programs, etc.) include a minimum of 30 percent post-consumer recycled content, and tissue products in stadium restrooms are made from up to 100 percent post-consumer recycled content. Media guides are now available electronically. For the 2012 All-Star Game, the Kansas City Royals reduced paper use by creating an electronic media guide and transitioning to a digital ticket system.

■ **FOOD:** All-Star Games have featured biobased and compostable food serviceware, including concessions serviceware and cups distributed at MLB hospitality events. At Chase Field, site of the 2011 All-Star Game, reusable "loyalty cups" were made available to season ticket holders. Both Chase Field and Kauffman Stadium, host facility for the 2012 All-Star Game in Kansas City, collected used grease from all kitchens and concession stands to be recycled into biofuel. After several of the 2012 All-Star events, including the All-Star Game Gala and Pre-Game Celebration, unused prepared food was collected and donated to Harvesters.

■ **WATER:** For the first time in 2012, MLB committed to offset the approximately 600,000 gallons of water consumed in the ballpark in the course of the All-Star events by purchasing Water Restoration Credits from Bonneville Environmental Foundation. The Water Restoration Credits are used to restore water in depleted watersheds. Also in 2012, the Kansas City Royals partnered with Grundfos to improve the efficiency of the water fountains in Kauffman Stadium.

■ **COMMUNITY:** MLB has led teams of volunteers at All-Star Games in using eco-friendly materials to complete projects for local communities, including refurbishing a number of Boys & Girls Clubs and a community garden, rehabilitating a veterans' home, and constructing playgrounds. These projects typically entail not only refurbishment with features like solar hot water heaters, Forest Stewardship Council certified wood, and low-flow plumbing fixtures, but also include educational components. For example, in 2009, MLB's work with a Phoenix veterans' home included constructing a new onsite greenhouse for use by the facility's cooking staff, as well as forming horticultural clubs to demonstrate and teach about sustainable food practices.

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■ **OUTREACH:** Online environmental messaging is also part of MLB's All-Star Game greening work. MLB.com features a Team Greening section, which includes eco-tips and other information about what fans can do to reduce their environmental impact in conjunction with All-Star and other greening initiatives. MLB All-Star Games have featured PSAs promoting recycling and other ways for fans to be more environmentally conscious, in-stadium signs, and messages in the All-Star Game program.

MLB All-Star Games have provided the league and host teams with an opportunity to showcase and expand on greening work being done at All-Star Game-related facilities. For example, Salt River Fields at Talking Stick, the Spring Training home of the Arizona Diamondbacks and Colorado Rockies, hosted the MLB All-Star Game Fantasy Camp during the 2011 All-Star Week. The facility, which opened in February 2011, was awarded LEED Gold Certification for New Construction, and is the first sports training venue to receive LEED Gold certification in the United States. To achieve this certification, the project incorporated numerous sustainable elements, including orienting the stadium to provide maximum shade, incorporating native vegetation, minimizing stormwater runoff, and constructing parking lots that are covered with grass instead of asphalt, enabling them to serve as playing fields for the host community when they are not needed for parking.

UNITED STATES TENNIS ASSOCIATION
US OPEN TENNIS CHAMPIONSHIP

"Our courts may be blue, but we're thinking green." That's the environmental pledge of the United States Tennis Association (USTA), which hosts more than 700,000 fans each year during the two weeks of the US Open Tennis Championships held at the USTA Billie Jean King National Tennis Center.

USTA partnered with NRDC to launch its official greening effort at the 2008 US Open, including the tournament's first water bottle and aluminum can recycling program, and the greening program has continued to make strong improvements at every Open since.

"The commitment and expansion of the US Open Green Initiatives will ensure that the world's highest annually-attended event is the most environmentally conscious," said Jon Vegosen, chairman of the board and president, USTA, and chairman of the US Open. "These environmental endeavors have kept the USTA, the US Open and tennis fans in the forefront of the global effort to preserve the environment."

NRDC's collaboration with USTA began in 2008, when tennis legend Billie Jean King reached out to NRDC's sports greening team. The USTA National Tennis Center in Queens, New York was renamed The Billie Jean King National Tennis Center in 2006, and since that time Ms. King has sought to assure that the facility is operated in an environmentally responsible way. The USTA commissioned an environmental audit of the National Tennis Center that led to the implementation of many changes, including adding energy-efficient systems such as individually-controlled temperature zones and variable frequency drives, which have reduced the amount of energy used by 168,000 kWh per year (representing an annual savings of $34,000 and a reduction of 70 metric tons of CO_2 per year).

By 2011, other improvements at the Billie Jean King National Tennis Center included court surfaces made from 17 percent post-industrial recycled content (that required 57 percent less energy to produce than traditional surfaces); ultra-low-flow faucets that reduced water flow by 75 percent; and energy-efficient lighting and refrigerator upgrades in the Players Lounge (reducing energy consumption by 50,000 kWh/year).

"We are taking a big step with the home of the US Open becoming one of the first in the tennis community to take significant action to positively impact the environment," said Billie Jean King. "The US Open will serve as a springboard for other tennis events to declare their commitment and actions to a greener approach to our sport."

One major innovation initiated at the 2008 US Open was tennis ball can recycling. The cans are challenging to recycle, as they are made from three different types of plastic polymers—a PET body, an LDPE lid, and a PVC label—and include a metal rim. NRDC identified a recycling partner, SIMS, who figured out how to cut the metal rim from the plastic can and recycle each part of the cans. As a result, the more than 16,000 Wilson tennis ball cans used at the tournament that year were collected and recycled for the first time.

Other US Open environmental achievements have included:

- **ENERGY:** 100 percent of the electricity consumed during the US Open is offset by the event's energy provider with Green-e certified wind renewable energy certificates. IBM, which powers USOpen.org, switched to using only six servers in 2010, down from 60 in 2008; this change (and accompanying reduction in required floor space) reduced the energy consumption required by IBM for the US Open by 40 percent, and reduced cooling demand by 48 percent.

- **RECYCLING/COMPOST:** A plastic and aluminum can recycling program was implemented in 2008 with more than 80 new recycling receptacles (provided by Evian) placed throughout the center grounds; as a result, the USTA diverted 85 tons of waste from its waste stream in 2008, avoiding over 260 tons of greenhouse gas emissions. Recycling receptacles now cover the National Tennis Center grounds on a one-to-one ratio with waste receptacles. The Open continues to add to its recycling and composting initiatives, with

programs launched in 2011 that include metal tennis ball can top recycling, and composting in kitchens and the Food Village dining area. In addition to collecting organic waste from kitchens and restaurants for composting, cooking oil is recovered for conversion into biodiesel fuel. The Open's landfill diversion rate increased by almost 30 percent in 2011 from 2010, with over 200 tons of waste diverted from landfill.

■ **REUSE:** 70,000 tennis balls used during the matches and practices at each Open are reused by USTA tennis programs or donated to community and youth organizations throughout the country.

■ **FOOD:** Levy Restaurants provides ecologically preferable paper products made from post-consumer recycled paper, switching 2.4 million virgin paper napkins to 100 percent post-consumer content in 2008. In addition, through its partnership with Levy, the US Open's local and organic food offerings represented 34 percent of the menu in 2011, with expanded use of organic produce and meats from local farms, and all food serviceware in the Food Village was compostable.

■ **PAPER:** In 2008, the USTA switched the paper it used for game day drawsheets to 100 percent post-consumer recycled content, and in so doing saved 2,123 gallons of wastewater and avoided generating 441 pounds of CO_2-equivalent greenhouse gases and 129 pounds of solid waste. Currently, all paper products used on the grounds, including tickets, maps, tournament guides, restaurant passes, parking flyers, and napkins, include at least 30 percent post-consumer content. Many printed materials (program, drawsheet, etc.) are printed on paper certified by the Forest Stewardship Council. All paper towel dispensers have been replaced with motion-sensor dispensers.

■ **TRANSIT:** The USTA encourages US Open fans to use public transportation during the tournament, including a program first funded by NRDC and now supported by Esurance that distributes over 2000 metro cards to attendees, and through US Open-specific MTA advertisements urging fans to take the subway to the USTA Billie Jean King National Tennis Center. In 2011, 60 percent of fans took mass transit to the US Open, up from 32 percent in 2000.

■ **OUTREACH:** NRDC produced environmentally-educational PSAs featuring Venus Williams, Billie Jean King, and doubles champions Bob and Mike Bryan that were shown throughout the grounds of the USTA Billie Jean King National Tennis Center, including on the Arthur Ashe Stadium jumbotron, at the 2008 US Open (and at subsequent USTA events). The PSAs educated fans and attendees about the environmental benefits of recycling, taking mass transit, buying local and organic food, and using recycled-content

paper, as well as directing them to www.nrdc.org for more information. Two additional Green USTA PSAs produced in 2010 feature Alec Baldwin. NRDC's Eco-Tips reminding fans to reduce, reuse, and recycle are promoted in the US Open Daily Draw-Sheet, at USOpen.org/USTA.com, and in voice announcements heard throughout the grounds. Over 100,000 wallet-sized NRDC eco-tips cards were distributed to 2008 US Open attendees, directing fans to www.nrdc.org. In 2011, the USTA began posting these tips through its social media channels.

■ **MERCHANDISE:** Green products featured as part of the overall US Open Collection of merchandise have included 100 percent organic cotton t-shirts (designed by Heidi Klum and Billie Jean King), hats comprised of 50 percent post-consumer plastic (each hat containing the equivalent of two one-liter recycled plastic bottles), cinch backpacks (each containing the equivalent of six recycled plastic bottles), and reusable totes made from 80 percent post-consumer content. A portion of the proceeds from the US Open organic collection was donated to Unisphere, Inc., the non-profit organization dedicated to maintaining and preserving Flushing Meadows Corona Park, home of the US Open.

"The USTA is committed to reduce its ecological impact and continuously seeks new ways to be at the forefront of the global effort to preserve the environment," said Gordon Smith, executive director and chief operating officer, USTA. "Our dedication to US Open's greening efforts will create a lasting legacy for the environment, as well as encourage tennis fans from all over the world to be environmental stewards."

"If we just take small steps," adds Billie Jean King, "it will lead to big change."

NATIONAL BASKETBALL ASSOCIATION ALL-STAR GAME AND GREEN WEEK

The NBA began working with NRDC's sports greening project in 2007 to enhance the environmental profile of the league. NRDC and NBA launched the league's greening initiative by creating an environmental policy statement that established the league's goal to improve their environmental performance, and presented their sustainability initiative as an institutional priority.

"Through the NBA Green initiative, the league and its teams are taking steps to become a more environmentally responsible organization," said NBA Commissioner David Stern. "With the NRDC's invaluable partnership, we have implemented recycling programs, installed energy- and water-saving fixtures, encouraged the use of sustainable supplies, and promoted the use of mass transit. We know there is more we can do, and we look forward to continuing to work with the NRDC and our teams to help protect our environment."

During the launch of the NBA's green initiative, NRDC assisted the league with environmental assessments at their front offices and at the NBA Store in New York City. NRDC offered strategic advice to the NBA Store on improving their procurement and operational practices, including waste and paper reduction, better paper procurement, low-VOC and environmentally friendly cleaning products and paints, an improved recycling program, and energy-efficiency improvements. At NRDC's suggestion, the NBA removed all plastic items containing the chemical BPA that might come in contact with children. This NBA initiative was four years before the U.S. FDA recommended removing BPA from plastics.

Environmental features have also been incorporated into the NBA's offices and staff events. For instance, the NBA's company-wide picnic in June 2009 reduced the use of disposable utensils, recycled all aluminum cans and plastic bottles, and used 100 percent post-consumer recycled paper products such as sandwich wrap, inner cartons and trays, napkins, and shopping bags.

Soon after the launch of the league's environmental initiative, the "NBA Green" program was formed under the NBA's philanthropic NBA Cares program, and NRDC created customized Greening Advisors that were distributed to all NBA teams and posted on the NBA's HomeCourt intranet site. These web-based advisors provide a comprehensive toolkit for teams and arenas to green their operations.

In an effort to highlight their growing environmental initiatives and engage fans, sponsors, partners, and players, the NBA held its first-ever NBA Green Week in April 2009 at all NBA arenas around the country. As with subsequent Green Weeks, the league held auctions to support environmental efforts, sponsored hands-on community service projects, and featured special on-court apparel.

The inaugural 2009 Green Week also marked the launch of the NBA Green website at www.nba.com/green, including NRDC green tips for home and office, videos and news about team and player greening efforts, and links to resources such as NRDC's Greening Advisor for NBA. In early 2012, the NBA collaborated with NRDC to produce a public service announcement about the league's greening initiative. This PSA was shown in all arenas and on broadcast TV, including ESPN, ABC-TV, TBS, and TNT, as well as NBA-TV, and was viewed by more than 17 million people. The PSA showcased NBA's commitment to renewable energy, recycling, water conservation, and reduced packaging. NBA plans to air this PSA each Green Week in the future, and possibly during its All-Star Game and playoffs.

"One of the things we do well at the NBA is share information and best practices among all of our teams," said Kathy Behrens, executive vice president of social responsibility and player programs for the NBA. "We're

obviously incredibly competitive when it comes to the game and the action on the court. But off the court, we really focus on the things that we can learn from each other, and a lot of what you see on the NBA Green website is really designed to help educate our teams and fans."

The NBA continues to sponsor Green Week each year, working closely with NRDC to continuously improve environmental attributes.

For example, the NBA engages in a number of environmental messaging initiatives. The league's official outfitter, adidas, has provided All-Star players with shirts featuring the NBA Green logo and made from 50 percent recycled polyester. During nationally broadcast games throughout Green Week, players also wore NBA Green headbands, wristbands, and socks made from 45 percent organic cotton. NBA.com held an online auction of Spalding basketballs incorporating 40 percent recycled content and autographed by NBA players. The NBA Store, NBAStore.com, and select team retailers also offered organic cotton NBA Green t-shirts, hats, socks, headbands, and wristbands for purchase, along with recycled-content Spalding basketballs.

Each of the league's 30 teams hosts Green Week community service events such as tree plantings, recycling drives, and park clean-up days to encourage fans to get involved in the league's greening initiative. Teams have also hosted in-arena Go Green Awareness Nights, including promotions of "greener living" tips and auctions to support environmental protection organizations.

"Thanks to great guidance from the NRDC, the NBA and our teams continue to implement new measures to reduce energy consumption and waste throughout all of our business areas," said Kathy Behrens. "NBA Green Week highlights the importance of environmental protection while encouraging fans to do their part by incorporating green habits into their daily lives."

In 2010, league partner HP worked with the Miami HEAT, the Houston Rockets, and the Dallas Mavericks on special service projects throughout NBA Green Week, including a beach clean-up event, and refurbishing homes with Rebuilding Together.

Also during the 2010 NBA Green Week, the NBA Store in New York City hosted a footwear drive to collect slightly worn athletic shoes for donation to Hoops 4 Hope, a global nonprofit organization teaching life skills through basketball to youth in southern Africa. Customers who brought in shoes received a 20 percent discount on purchases of new athletic shoes.

During the 2011 NBA Green Week, the NBA and Sprint launched a Facebook application called "Unlimited Acts of Green," designed to help fans make greener choices in their daily lives. The app included a list of green acts for fans to select from, including cell phone recycling, and displayed the resulting environmental benefits associated with all fan pledges, including amounts of greenhouse gases, electricity, and water saved.

Other NBA event greening initiatives have included:

- NRDC assisted in greening NBA's EuropeLive tour in October 2008, which featured NBA games in four countries in Europe. The 02 arenas being used in London and Berlin were a showcase for sustainability, as they already had in place many environmental features. In London, this included the diversion of 100 percent of food waste for composting and 100 percent of used cooking oil for biodiesel; advanced recycling programs for glass, plastic, paper, and cardboard, which diverted 60 percent of all waste from landfills; a rainwater catchment and recycling system and other water conservation measures; enhanced transportation options that enabled 75 percent of attendees to take mass transit; and energy-efficient lighting, HVAC equipment, and building structure.

- NRDC began its NBA All-Star Game greening collaboration at the 2008 NBA All-Star Game in New Orleans by arranging for an energy audit of the New Orleans Arena and adjacent Louisiana Superdome and Convention Center. NRDC helped the NBA to improve the existing recycling program at the arena to include plastic bottles and aluminum cans, to procure 100 percent recycled content bathroom tissue at the arena, and to provide hybrid cars for staff transportation during the event.

- The 2009 All-Star Game in Phoenix provided the US Airways Center with a chance to showcase their newly installed solar power system. The 1,100-panel solar array, spanning 18,000 square feet atop a parking garage at the arena, is capable of generating approximately 332 MW of energy annually. That's enough energy to power the US Airways Center for 26 Suns home games—the equivalent of eliminating the release of 44,000 pounds of carbon dioxide each year. The NBA also purchased Green-e certified windpower RECs from Arizona Public Service, the US Airways Center's utility, to offset the equivalent of 1,500 megawatt hours of power used at the 2009 All-Star Game. Additionally, the NBA purchased carbon offsets for all generator use at US Airways Center during the All-Star Game, and for the All-Star Game Jam Session and NBA Block Party.

- The 2009 All-Star Game also incorporated comprehensive recycling and waste reduction efforts. An expanded recycling program was implemented at US Airways Center, NBA All-Star Jam Session, the NBA All-Star Block Party, the Phoenix Convention Center, and Heritage Square (during the NBA welcome party) for plastic bottles and aluminum cans. Recycling PSAs were aired in US Airways Center and at the Jam Session and NBA Block Party to remind all attendees to recycle their cans and bottles at all events.

- The 2009 All-Star Game also encouraged and promoted public transportation options with maps, schedules and information provided through the Jam Session website. Paper products, including Jam Session brochures, credentials, office copy paper, media guides, and tickets, were printed using soy inks on paper with post-consumer recycled content that was manufactured using windpower.

Subsequent All-Star Games have continued to expand on these positive environmental initiatives, incorporating individual measures appropriate to each venue. Some additional examples of NBA All-Star Game successes include:

- Ongoing purchase of renewable energy credits and carbon offsets to balance power consumed at the All-Star Games.
- Expanding recycling services in facilities used in All-Star events.
- Avoiding potentially harmful polyvinyl chloride (PVC) plastics in producing banners.
- Showcasing the use of an electric vehicle used for Jam Van, with solar panels powering interior accessories.

In addition, the NBA has partnered with host cities and recycling organizations, as well as companies such as Sprint, to conduct electronics recycling drives in conjunction with All-Star Games and Green Week. The NBA and its partner organizations encourage fans to bring electronics nearing their end of life to their e-recycling events, where they are recycled responsibly by e-Steward certified organizations. Fans dropping off electronics for recycling receive prizes such as tickets to NBA All-Star Jam Session, a four-day interactive basketball event featuring more than 500,000 square feet of NBA All-Star entertainment. During the NBA All-Star Games 2012 in Orlando, the NBA and Sprint collected 23,000 pounds of used electronics for recycling.

NATIONAL HOCKEY LEAGUE ALL-STAR GAME, THE WINTER CLASSIC AND THE NHL DRAFT

As part of its commitment to environmental stewardship, the National Hockey League joined forces with NRDC on sustainability initiatives in 2008, when NRDC assembled an NHL Greening Advisor for each team in the league. The NRDC Greening Advisor for the NHL, like those produced by NRDC for other leagues and organizations, is a web-based resource that offers environmental guidance and strategies to promote more sustainable practices for NHL team and arena operations.

"Most of our players learned to skate on outdoor rinks," says NHL Commissioner Gary Bettman. "For that magnificent tradition to continue through future generations we need winter weather—and, as a league, we are uniquely positioned to promote that message. We are thrilled to be able to work with the NRDC and to draw upon its vast experience and expertise in greening league events and league and club operations."

In January 2010, with support from NRDC, the NHL formally launched "NHL Green," an initiative designed to enhance the league's ecological profile while educating fans about environmental issues. The league simultaneously launched its NHL Green website (nhl.com/green), which features news stories and videos highlighting current league and team greening efforts, NRDC-generated green tips for fans, and links to websites providing additional information and resources. NHL Green offers information to clubs and facilities on efficient and cost-effective environmental practices.

The NHL's commitment to environmental excellence and education has also been a focus of its jewel events. For example, following the 2010 NHL Winter Classic at Fenway Park in Boston, the NHL hosted a panel discussion on "Sustainable Success: Business and the Environment," to discuss how environmental stewardship of the planet can be good for both business and the economy. The event was moderated by New York Times columnist David Brooks and featured Boston business leaders, academics, and NRDC Senior Scientist Allen Hershkowitz.

In early 2012, the NHL collaborated with NRDC to produce a public service announcement about the league's greening initiative. This PSA was shown in all arenas and on broadcast TV, including ESPN, ABC-TV, TBS, and TNT, as well as NHL-TV, and was viewed by more than 20 million people.

Starting in the 2010-11 season, the NHL established a league-wide initiative to work with Rock and Wrap It Up! to donate unused prepared food. All 30 NHL teams committed to pack up all prepared but unsold concession food on game nights for redistribution to local shelters and other places that serve people in need. Over the course of the initiative's first full season, NHL clubs provided 163,000 meals to people in need and diverted 105 tons of food from landfills and incinerators across North America. This effort earned each of NHL's four Midwestern clubs the U.S. EPA's Region 5 Environmental Quality Award for its participation in the agency's WasteWise Food Recovery Challenge. Four NHL Clubs in EPA Region 2 won that region's EPA Environmental Quality Award, and the Boston Bruins received EPA Region 1's Environmental Merit Award, all for their food diversion work with Rock and Wrap It Up! According to the U.S. EPA, the NHL reduced greenhouse gas emissions by the equivalent of 79 metric tons of carbon dioxide through this initiative. As of May 2012, the league-wide food recovery program had diverted more than 200 tons of waste from landfills and incinerators and provided local shelters with more than 300,000 meals.

In July 2011, the NHL was named to the Official Shortlist for the 2011 Beyond Sport Awards as a finalist in both the "Sport for the Environment" and "Federation of the Year" categories for its work in sustainability, primarily its initiatives with food donation. In December 2011, the NHL was officially awarded the 2011 "Sport for the Environment" Award. The NHL was also named to the Official Shortlist for the 2012 Beyond Sport Awards.

The NHL has also worked with NRDC to incorporate green practices and procurement into numerous league events, including the 2010 NHL Draft, the 2011 Winter Classic, the 2011 All-Star Game, and the 2011 Stanley Cup Final.

The 2010 NHL Draft was held in Los Angeles at STAPLES Center, which boasts many sustainable features such as solar panels, waterless urinals, and a robust recycling program.

Additional environmental initiatives for the draft included:

- Purchasing Green-e certified carbon offsets for all venue energy use;
- Reducing transportation needs to the venue by hosting the majority of NHL personnel at hotels within walking distance from STAPLES Center;
- Eliminating most paper collateral from the event by making Media Guides and Year-End Review packets available online only; and
- Printing tickets on recycled stock.

The 2011 Winter Classic, held at Heinz Field in Pittsburgh, included a variety of greening efforts, such as:

- Purchasing Green-e certified carbon offsets for stadium energy use;
- Eliminating single-use plastic bags and replacing them with 40,000 free reusable commemorative bags available at merchandise stands;
- Recycling all cardboard, bottles, and cans inside the stadium;
- Coordinating the pickup and distribution of prepared but unsold concession food as part of the Rock and Wrap It Up! Initiative;
- Installing recycling receptacles next to each trash can on streets surrounding Heinz Field to combat the usual amounts of game-day litter and offer an option for recycling (now a season-long initiative);
- Collecting recyclables at tailgating parties; and
- Offering free public transit passes by the Port Authority of Allegheny County (paid for by sponsor Pepsi MAX) to fans traveling to the game.

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Additionally, the Winter Classic's location in Pittsburgh helped draw attention to the Consol Energy Center, the new home of the Pittsburgh Penguins and the first NHL arena to achieve LEED Gold certification.

The 2011 All-Star Game, held at RBC Center (now PNC Arena) in Raleigh, North Carolina, incorporated many environmental initiatives, including:

- Purchasing carbon offsets for energy use at the stadium;
- Eliminating single-use plastic bags and replacing them with free reusable commemorative bags at merchandise stands;
- Robust recycling programs both inside and outside the stadium, including tailgate recycling;
- Donating unused prepared food to the Inter-Faith Food Shuttle;
- The headquarters hotel, Raleigh Marriott City Center, donated unused toiletries, boxed lunches, packaged food, and clothing to Raleigh Rescue Mission; and
- An All-Star Open Street Fair before the All-Star Game where corporate sponsors Honda and North Carolina State University hosted sustainability booths and educated fans about their recent environmental initiatives.

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At the 2011 Stanley Cup Finals, the league launched the NHL Water Restoration Project, a water balancing commitment focusing on the issue of freshwater scarcity and its effect on fans, communities, and the game of hockey. This initiative seeks to reduce water consumption in NHL arenas while simultaneously helping to conserve and protect depleted watercourses in the Northwest through a partnership with Bonneville Environmental Foundation. (BEF is a not-for-profit organization co-founded by NRDC.) For the Stanley Cup Finals, the NHL purchased Water Restoration Credits from Bonneville Environmental Foundation to balance the amount of water used during the series at TD Garden (Vancouver) and Rogers Arena (Boston). The league's purchases resulted in the restoration of more than 1 million gallons of water to a critically dewatered Oregon stream.

Subsequently, the league purchased Water Restoration Credits to mitigate the 3.5 million gallons of water consumed over the course of the 2012 Winter Classic in Philadelphia.

In early 2012, NHL Green introduced Gallons for Goals, a second phase to the Water Restoration Project. For every goal scored during the regular season, the league committed to restore 1,000 gallons of water to a critically dewatered river in the Northwest. As a result of this commitment, the NHL announced in April 2012 that, with 6,700 goals having been scored that season, the league replenished more than 6.7 million gallons of water to this watercourse. The league pledged to continue the Water Restoration Project with the water consumed at the 2012 Stanley Cup Finals.

The NHL also committed to purchasing renewable energy certificates (RECs) and carbon offsets to balance the carbon emissions resulting from arena electricity consumption and team air travel for all games in the 2012 Stanley Cup Playoffs. The league purchased 9.8 million kilowatt-hours (kWh) of Green-e Energy certified RECs (from U.S. wind projects) and 97 metric tons of carbon offsets from projects authenticated by the Verified Carbon Standard or the Climate Action Reserve. In addition, the league mitigated its 2012 electricity use (estimated at 1.5 million kWh) at its New York City headquarters through this initiative. In total, the RECs and carbon offsets purchased by the NHL in 2012 for the Stanley Cup Playoffs and league headquarters reduced carbon dioxide emissions by more than 15 million pounds, equivalent to taking approximately 1,310 cars off U.S. roads for one year. Through these purchases of RECs and carbon offsets, the NHL became the first professional sports league to join the U.S. Environmental Protection Agency's (EPA) Green Power Partnership, a voluntary program that encourages organizations to buy green power as a way to reduce the environmental impacts associated with purchased electricity use.

NATIONAL COLLEGIATE ATHLETIC ASSOCIATION FINAL FOUR

For the first time in the history of the NCAA Final Four, a sustainability committee was formed in 2011 to integrate ecologically intelligent practices into the event's planning and production. The Natural Resources Defense Council (NRDC) was asked to join as a founding member of the NCAA Final Four Sustainability Committee, teaming up with LG Electronics, Waste Management, Reliant Park, the City of Houston and the George R. Brown Convention Center.

The Committee began work on the environmental features of the event more than nine months in advance. Conference calls among all the members were held weekly, and during each call a particular environmental feature was assessed and action items to reduce impacts were assigned to the appropriate team member.

The first action of the Final Four Sustainability Committee was the commissioning of a Sustainability Performance Assessment to gauge current sustainability practices at the facilities and identify opportunities for improvement. This assessment was used to develop the baseline data against which the NCAA Final Four Sustainability Committee measured its achievements.

In the NCAA, 400,000 student athletes participate in 89 events each year, and millions follow NCAA events. Most of the 145,000 fans at Reliant Stadium in 2011 probably noticed the 600 newly installed recycling bins and the Jumbotron messages reminding people to recycle. They may have also realized their programs were made with post-consumer recycled content.

Green highlights of the 2011 NCAA Final Four events included:

- **ENERGY:** With support from the City of Houston, 100 percent of the energy used by George R. Brown Convention Center (Bracket Town) was supplied by renewable wind power. Emergency power systems at the facility are operated by energy from solar panels, and energy-efficient water pumps that use 60 percent less energy than the previous pumps were installed. Water chillers at the facility provide cold water to chill all walk-in refrigerators and freezers, eliminating the need for individual refrigeration units, and powering onsite ice-makers that eliminate the need for trucking in ice. The Convention Center subsequently earned LEED Silver certification for Existing Buildings Operations and Maintenance.

At the Reliant Stadium, carbon offsets into wind and solar power projects were purchased from the Bonneville Environmental Foundation, resulting in avoided global warming emissions totaling 210 U.S. tons in CO2 equivalents, representing about 509,000 auto miles.

- **TRANSPORTATION:** Green-e Certified Carbon offsets were also purchased through CarbonFund.org to offset bus travel between hotels, venues, and Reliant Stadium. To reduce idling time, buses were asked to shut down if there was a wait of ten minutes or longer.

- **WASTE/RECYCLING:** Through the support of Waste Management Inc., Sustainability Partner of Bracket Town and The Big Dance Concert Series, the number of recycling containers at Reliant Stadium was increased by nearly 600, matching every trash can with a recycling bin. Those recycling bins will remain at the stadium permanently. At Bracket Town, more than 100 new recycling containers were added around the stadium, and only plastic trash bags incorporating recycled content were purchased. Over the course of the weekend, the Final Four recycled nearly ten tons of materials, including cardboard, paper, bottles and cans.

For the first time, Reliant Stadium started a food waste composting program for food preparation and food waste from suites, in two of their largest kitchens, and in four suite kitchens during the Final Four. More than 25 containers (donated by Norseman Environmental Products) were used in the back of the house to implement this program. The program collected 0.87 tons of food waste. During the Final Four weekend, George R. Brown Convention Center also collected between 1 to 1.5 tons of food waste from all catered events and food preparations for composting.

Discovery Green, site of the Big Dance Concert Series, is a LEED Gold-rated facility. More than 100 recycling containers were distributed at Discovery Green to collect recyclables. The program diverted 5.55 tons of recyclables. Coca-Cola, an official NCAA Corporate Champion, promoted recycling at their Recycling Educational Exhibit.

The Press Room recycled paper, bottles, and cans.

All special event buses had recycling containers.

All hotels in the city-wide room block were encouraged to recycle and sustain their programs after the Final Four weekend. 79 percent of the hotels affiliated with the event had some form of recycling program.

In March 2011, the NCAA, the Houston Final Four Local Organizing Committee, Waste Management and LG Electronics USA held an e-waste collection event at Reliant Stadium, collecting more than 25,000 pounds of electronic waste to be disassembled and processed for recycling in the United States. Leading up to the Final Four, Reliant Stadium also recycled 20,000 pounds worth of CRT TVs when they were replaced with flat screen monitors. The CRT TVs are also being disassembled and processed for recycling. By teaming up with Official NCAA Corporate Partner LG, Conn's Appliances also supported the event at their 23 Houston-area locations. Every family that brought in products for recycling received instant savings at Conn's on any LG-brand EnergyStar® flat-screen televisions.

■ **FOOD:** At Bracket Town, 15 to 20 percent of food purchases were from local sources. At Reliant Stadium, unused prepared food was donated to local food banks and other non-profits.

All disposable cutlery used at Bracket Town events was bio-based and compostable. Napkins were made from 100 percent recycled content, and all cooking oils were collected for use as biodiesel.

■ **PAPER/PURCHASING:** All cleaning products used at Bracket Town were Green Seal-certified, reducing toxics exposure.

All copy paper purchased incorporated 30 percent post-consumer recycled content and FSC-certified fiber. Paper towels in Bracket Town bathrooms were comprised of 95 percent total recycled content with 15 percent post-consumer content, and the toilet paper incorporated 80 percent total recycled content with 20 percent post-consumer content.

The 2011 Final Four game programs were printed on coated paper including at least 10 percent recycled content and using soy-based ink. All paper used in the Press Room incorporated 30 percent post-consumer recycled content.

To reduce paper use, the NCAA Final Four created a new mobile cell phone application to help fans locate events, find restaurants and make reservations, among other functions. Printed fan guides were also eliminated. Event schedules were displayed on bus monitors, eliminating the need for printed copies.

■ **OUTREACH:** During the NCAA Final Four games, PSAs promoting recycling were played several times per game on the scoreboard, displaying the following message to 145,000 fans: "The NCAA would like to remind you to recycle your plastic bottles in the receptacles on the concourse. Let's all act responsibly."

The NCAA and the Houston Local Organizing Committee (HLOC) planted 68 native Mexican plum trees in Wiess Park, a local community park, representing the number of teams playing in the tournament. Houston-area residents participated in an educational ceremony alongside the tree-planting event to demonstrate safe planting guidelines, and community volunteers planted power-line friendly trees. Members of the HLOC Sustainability Committee and corporate leaders from Waste Management and CenterPoint Energy donated 68 recyclable Right Tree Right Place totes to the first 68 adults to arrive, and distributed 68 basketball goodie bags to the first 68 children onsite. The HLOC also donated basketball backboards and goals for the basketball court to the students of Grady Middle School. A permanent placard was placed to recognize the event.

The NCAA Final Four 2012 continued to expand on the sustainability initiative introduced in 2011, including hosting a new educational outreach event called "Greening the Hospitality Zone." Together with The Greater New Orleans Hotel and Lodging Association, LifeCity, and the Sustainability Committee of the New Orleans Local Organizing Committee for the 2012 Men's Final Four, the 2012 NCAA Final Four Sustainability Committee invited representatives of the hospitality industry to attend this event to share greening strategies, discuss ecotourism, and promote more sustainable practices in the hospitality industry.

In March 2012, the LG Electronics Recycling Program continued the e-recycling project developed the previous year, this time for New Orleans area residents, who were able to bring electronic waste to the Mercedes-Benz Superdome (site of the 2012 NCAA Final Four semifinal and national championship men's basketball games) for recycling. The eCycling drop-off location was designed to make recycling of electronic products easy and convenient—residents did not even need to exit their vehicles, as the eCycling crew members collected all acceptable electronic products from car trunks and pickup beds.

Also for the 2012 NCAA Final Four, REpurposingNOLA Piece by Peace produced 100 iPad cases using 25 street pole banners that had lined the main route to the Superdome for the NCAA Final Four Men's Basketball Championship, which was played in New Orleans. The iPad cases were provided to NCAA VIP guests and sponsors.

"The NCAA strives to make an impact on and off the court during the Men's Final Four. As part of our efforts, we have a major focus on sustainable activities and increasing awareness of sustainable activities each year in the Final Four city," said Byron Hatch, the NCAA's director of championships and alliances. "The people in New Orleans, who assisted us with this effort, informed us about REpurposingNOLA, and the great work this company does with repurposing event décor elements into high quality products. It was an activity that we had not pursued in previous years. Therefore, we decided to pursue this opportunity as another activity to support the environment and raise awareness about various avenues to foster sustainability."

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CASE STUDY

LINCOLN FINANCIAL FIELD, HOME OF THE PHILADELPHIA EAGLES

FACILITY STATS

Location: Pattison Avenue, Philadelphia

Opened: August 3, 2003

Seating Capacity: 68,532

Owner: City of Philadelphia

Operator: Philadelphia Eagles

Venue Uses: NFL games (primary), MLS games, collegiate football games, collegiate lacrosse games, Monster Jam, and a variety of concerts.

Construction Cost: $520 million ($647 in 2012 dollars)

THE EAGLES' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Philadelphia Eagles have been pioneers in the greening of professional sports operations and supply chains since establishing their Go Green program, with the help of the Natural Resources Defense Council (NRDC), back in 2003.[1] From switching to recycled paper products nearly a decade ago to installing the most extensive onsite renewable system of any U.S. sports stadium in 2012, the Eagles work to promote the social, ecological and financial benefits of going green.

WHY GO GREEN?

"Our greening program really all began at the ownership level with the opening of the NovaCare Complex—the Eagles' training facility—"and the construction of Lincoln Financial Field in 2003," says Don Smolenski, president and former chief operating officer, who has been with the Eagles since 1998.[2]

According to Smolenski, the owners of the Philadelphia Eagles, Jeffrey and Christina Lurie, made environmental stewardship part of the organization's mission statement before ecological social responsibility became more commonplace in the sports industry. "Our owners are philanthropic by nature; it's a very important part of who they are. That philanthropy carries over in their personal lives as well as with the team," says Smolenski. "The green message resonates with our owners. They recognize the incredible platform that professional sports and the Philadelphia Eagles have to demonstrate social good. They made a strong green commitment and fully believe that the Eagles can make a difference by reducing our environmental impacts."

In a press statement, the Luries explain the importance of the green commitment made by the Eagles, both as a business and as members of the Philadelphia community. "We search relentlessly for ways to reduce our environmental footprint, which is a daunting task when each and every home game draws 70,000 people to Lincoln Financial Field. Yet every day, in a variety of ways, we strive to conserve more, recycle more, and consume less," say the Luries. "This commitment makes good business sense, but more importantly, it helps our Eagles organization to fulfill our role as a community champion by inspiring others to take a step forward and '*Go Green!*' to help save our wonderful planet."[3]

"THE GREEN MESSAGE RESONATES WITH OUR OWNERS. THEY RECOGNIZE THE INCREDIBLE PLATFORM THAT PROFESSIONAL SPORTS AND THE PHILADELPHIA EAGLES HAVE TO DEMONSTRATE AND PROMOTE SOCIAL GOOD," says Don Smolenski, president and chief operating officer.

WHERE TO START?

The Eagles' green team began by asking questions. "We started by talking with people, with advisers like NRDC, the Sexton Group and others," says Smolenski. "Our program evolved slowly, with a little blue can at everyone's desk. Then it grew from there, year after year."

Smolenski explains that it was all about getting the right people at the table, including staff from all departments, and developing a comfortable environment for sharing ideas and making a plan. "The main issue early on was trying to establish a comfort level by making sure everyone was on the same page and then deciding how to proceed with our green mission in order to develop a strong program. It's a journey."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ The Eagles are installing 11,000 onsite solar panels and 14 onsite wind turbines to make Lincoln Financial Field the first professional stadium in the United States capable of generating all of its electricity onsite.
- ★ The Eagles have implemented a variety of energy conservation programs to reduce electricity consumption by more than 33 percent.
- ★ 100 percent of team operations are powered by clean energy generated on U.S. wind farms. The Eagles purchase 14 million kilowatt-hours of renewable energy credits annually.
- ★ From 2003 to 2010 the Eagles conserved enough energy and purchased enough green power to provide electricity for 7,150 average American homes for a year.
- ★ With increased monitoring and management and updated field infrastructure, the Eagles have cut their water use by 21 percent.
- ★ The Eagles have converted all of their tissue paper products to 100 percent post-consumer recycled paper, yielding an annual savings of 10 tons of paper or the equivalent of about 170 trees.
- ★ From 2003 to 2010 the Eagles' paper reduction and recycled paper purchasing efforts saved approximately 6,000 trees.
- ★ 37 percent of all chemical cleaning products used in 2010 (169 gallons) came from environmentally friendly product lines.
- ★ All of the Eagles' requests for proposals (RFPs) mandate that vendors propose green-certified materials as standards.

For the Eagles, this meant taking the time to introduce staff to environmental issues, making sure they understood the importance of the greening work and felt comfortable sharing ideas. "Now the dialogue and conversations are seamless. If you see something, there's no apprehension about saying something or asking a question. We feel like we're educated enough now to ask the right questions of our partners, which is the best place to be."

The Eagles figured out early that greening involves prioritizing. "Instead of implementing 10 things at once, we took two or three things and tried to implement them well," says Smolenski. "Once we had those first programs down, we took two or three more, then two or three more, then four or five more. Quality was important."

"THIS COMMITMENT MAKES GOOD BUSINESS SENSE, BUT MORE IMPORTANTLY, IT HELPS OUR EAGLES ORGANIZATION TO FULFILL OUR ROLE AS A COMMUNITY CHAMPION BY INSPIRING OTHERS TO TAKE A STEP FORWARD AND '*GO GREEN!*' TO HELP SAVE OUR WONDERFUL PLANET,"
say Jeffrey and Christina Lurie, owners of the Philadelphia Eagles.

Smolenski's team prioritized paper reduction strategies and the purchasing of recycled paper first, which were a natural fit because the financial savings from cutting paper use could pay for better paper products made from post-consumer recycled content. "We used to print 50,000 media guides; now we produce fewer than 2,000 guides and have everything else online," Smolenski says. "That's a huge tonnage of paper that we eliminated right away, not to mention some great cost savings. Now all of our tissue products are made from 100 percent post-consumer recycled paper. We've saved thousands of trees. We also invested in cardboard balers and aluminum balers," he adds.

The next step for the Eagles was tracking their progress, which took their project to a new level. "Measurement is really important. Once we developed better measurement procedures, we really started to gain momentum," says Smolenski. "That was big. You need to measure what you do and quantify savings. We track our figures throughout the stadium every month. It's about accountability at the end of the day. If you don't have accountability, how do you show your progress?"

The Eagles have a few systems in place to help track their performance. "We have an organization-wide meeting at the end of the season every year where all departments bring their annual data for review," explains Smolenski. "For example, the facilities department brings all energy, water and waste data stadium-wide; administration brings data on how much recycled-content paper we bought; merchandising brings data on the percentage of post-consumer recycled content in the catalog, among other products." In order to get more precise data, the Eagles also invested in scales to weigh materials collected for composting and recycling.

Smolenski emphasizes the importance of working closely with existing partners to advance the Eagles' green goals. "Our operations team would also work with external partners like ARAMARK, which covers the concessions and cleaning for the facility. We sat down with ARAMARK and conveyed to them that greening was important to us. They recognized that, and they made it important to themselves. As a result you start to develop this team, a real partnership, where everyone is working together on greening and efficiency," he

"WE'RE A BIG BUILDING. WE CAN FIT CLOSE TO 70,000 PEOPLE. WE USE A LOT OF ENERGY AND WATER AND GENERATE A LOT OF WASTE, BUT THAT DOESN'T MEAN WE HAVE TO BE WASTEFUL," says Smolenski. **"WE TRY TO BE RESPONSIBLE AND HAVE OUR FANS HELP US IN THAT EFFORT TO MITIGATE OUR ENVIRONMENTAL IMPACTS."**

explains. "You're able to establish a free-flowing dialogue where everyone can raise ideas and explore new ways of doing things, whether you're talking about cleaning chemicals or compostable serviceware."

CHALLENGES: OVERCOME AND ONGOING

Lincoln Financial Field faces many of the same size-based challenges that most sports venues have to grapple with. "We're a big building. We can fit close to 70,000 people. We use a lot of energy and water and generate a lot of waste, but that doesn't mean we have to be *wasteful*," says Smolenski. "We try to be responsible and have our fans help us in that effort to mitigate our environmental impacts."

From entertaining recycling signs posted around the venue to recycling bags for tailgaters, the Eagles match commitment with humor and convenience to engage fans in their green programs. "Our approach to fan engagement is just to lead by example. We pair all of our garbage cans with recycling containers to make it easy for people to recycle," says Smolenski. "We have green teams that hand out recycling bags for tailgaters to use and leave by their cars, and we pick them up later. Fans appreciate our recycling program, take part in it, and we feel like our message resonates with the community, even if there isn't always a numeric way of keeping track of that influence."

At one point the Eagles' waste system relied on trash chutes throughout Lincoln Financial Field and a team of staff that would sweep the facility with carts to pick up bags of recyclables. The system became problematic; the pickup routes were taking longer and getting cumbersome as the Eagles recycled more and more material. "So we flipped the system," says Smolenski. "We converted all of our trash chutes to recycling chutes, and we now use carts to pick up the trash."

"Thanks to our transformed waste stream, among other initiatives, we're now pushing upwards of a 75 percent waste diversion from landfill, and we're trying to get that higher and higher," Smolenski notes proudly. "From August through December of 2011, during our heaviest time of the year, we had an average diversion rate of 77 percent. For 2011 as a whole, we were at 72 percent diversion. Since February 2012 our diversion rate is up to 99 percent, a great accomplishment, even though it's during the off-season."

Smolenski attributes some of the Eagles' success to setting a high bar for their green program. "It's definitely an evolutionary process, but an outgrowth of that is setting big green goals," he explains. He says the weight of the Eagles' brand also plays an important role. "Our brand, what the Eagles and the NFL represent, is influential. So when you sit down with ARAMARK and a partner like SCA, which makes paper products, you can have good conversations about napkins made with post-consumer recycled paper," says Smolenski. "Initially they may say 'Oh, that's going to cost more,' but by working collaboratively and using the influence of the Eagles and ARAMARK brands, we could get recycled-content paper napkins at the same or even a lower cost than we could get non-recycled paper napkins. And for us that's a no-brainer; we're definitely doing that. And all our procurement discussions went that way."

Once the Eagles demonstrated their long-term commitment to greening, their partners not only joined their mission but also helped overcome ongoing challenges. "The general managers at ARAMARK are really into our greening work; they feel part of it and take ownership of it, which is awesome. They're always out looking for new products and opportunities," say Smolenski. "For example, for a while now

ONSITE RENEWABLE ENERGY PROJECT

By December 2012, the Eagles plan to have 11,000 solar panels and 14 wind turbines installed around Lincoln Financial Field producing 3 megawatts of electricity (about six times the power needed for home games). Smolenski explains how the Eagles were able to take on this massive project: "We entered into a 20-year relationship with NRG, headquartered in Princeton, New Jersey, which has really taken a leadership position in this area. The deal is structured so that NRG provides the up-front capital, which is in excess of $30 million. In return we entered into a long-term power purchase agreement with NRG at a rate that grows at a fixed percentage over time. That rate was about the rate we've been paying historically, with a set annual increase year after year. That provides us with the ability to manage the expense. From a business perspective, the arrangement provides us with some predictability around the energy expense, which is our largest operating expense for the facility. That is important because it doesn't make us subject to the conditions of the marketplace, which can be tough to manage at times. NRG was also able to take advantage of some federal programs that promote renewable energy, which also helped with the financials. NRG is a Fortune 500 company, and they really believe in this work. Greening is a component of their business mission, they're not just dabbling, and it's a good fit all around."

"UNLESS YOU'RE ALREADY INVOLVED IN OR ARE INVESTIGATING PROJECTS LIKE PURCHASING OFFSETS, YOU MAY THINK THAT IT'S STILL COST-PROHIBITIVE TO PURSUE THOSE KINDS OF INITIATIVES, BUT THAT'S REALLY NOT THE CASE ANYMORE," says Smolenski.

we've been looking for a compostable wrapper for our hot sandwiches," such as cheesesteaks. "It was our last packaging hurdle as everything else—all cutlery, plates, napkins and cups—is compostable. So we were searching with ARAMARK, we kept looking and kept pushing, and at the end of 2011 we were finally able to find a sandwich wrapper that is compostable but still keeps the sandwiches warm and fresh. So we're now able to raise our diversion goals and achieve a higher rate of success. By building on relationships within our industry, we can set the bar higher and can better take advantage of opportunities."

The Eagles don't yet collect compostables around the stadium concourse, but they do sort waste by hand after the game. Since 2009 they've worked with ARAMARK to implement composting throughout back-of-house operations and aim to move to front-of-house composting as well. "We started with one kitchen and then slowly worked our way up to composting in all kitchens and all back-of-house operations," says Smolenski. "When we started in 2009 there weren't any facilities that took commercial composting. We could only find a farmer from Neshaminy [in Pennsylvania] who literally came with his truck to load up our compost. But as we added more kitchens, we quickly had too much for him. So we had to wait for larger facilities to come online and for the market to grow," says Smolenski, who says that patience and perseverance made their composting program possible. "Finally a facility in Delaware could accept our material at the scale we needed."

The Eagles were able to grow their program and gain momentum by building on smaller successes like slowly improving their procurement practices and waste stream management. "There are little success stories like that along the way. And those success stories are often ideas that your team members and staff brought to the table, so they really feel good about the green wins," says Smolenski. "Those little success stories encourage more idea sharing and more successes, which lead us to where we are today, embarking on a huge project with NRG to install 11,000 solar panels and 14 wind turbines to produce almost 3 megawatts of energy from renewable sources. It's all doable, but it takes time. As long as you stay committed to the goal, you can get there."

When it comes to financing onsite renewable projects or purchasing renewable energy credits (RECs), Smolenski observes that the market has changed dramatically. The initiatives that may have seemed too expensive before are now very accessible. "Several years ago, when we started to purchase wind-based RECs to offset our electricity use, they were expensive," he says. "It cost about six figures to offset approximately 30 percent of our electricity use. Today we can offset 100 percent of our use in the very low five-figure range. Unless you're already involved in or are investigating projects like purchasing offsets, you may think that it's still cost-prohibitive to pursue those kinds of initiatives, but it's really not the case anymore."

LESSONS FROM THE FIELD

GET BUY-IN FROM TOP TO BOTTOM: "If you don't have the support of all of your managers, department heads and all employees, you won't be able to effectively implement your green programs," Smolenski states. "We often say, 'You need to motivate, build momentum and then measure to achieve success.' Once we were able to get buy-in at the management level, we were able to really grow the program. It was their initial involvement and their embracing of the issue that allowed us to build momentum," he explains. "That is everything from our HR and administrative team doing post-consumer and chlorine-free recycled paper work to our operations team, especially waste operations, evaluating how they were commissioning the building, improving the efficiency of the building management systems and working on the heating systems."

EDUCATE STAFF AND ESTABLISH A COMFORT LEVEL FOR THE PACE OF YOUR GREENING PROJECTS: According to Smolenski, it's important to educate all staff about the importance of a green program from the outset. "When we started with the Sexton Group, our consultants, there was a desire to come racing out of the gate. But that wasn't the mode that we operated in or that people felt comfortable in. There was some apprehension," he adds. "We needed to go through a learning period, where we learned from each other first through dialogue. Through good communication we got to a point where everybody, including all partners, recognized the importance of and embraced the green project. We were over the first hurdle. Then we needed to work together to figure out how best to implement the project."

MAKE YOUR ACCOMPLISHMENTS TANGIBLE: Convert your savings into imagery that the public can understand. "We try to make what we do tangible. For example, saying that we've recycled X number of tons doesn't mean anything, but if we say that it's enough material to fill the lower bowl of the stadium, you can really picture that. We convert our savings to make them more understandable and relatable, so that it matters to people," says Smolenski. "I don't think that's spin; that's just effective presentation. We're not just talking the talk; we're actually walking the walk. It's not greenwashing. It's not superficial. We believe in greening from the business and philanthropic perspective."

MAKE RECYCLING CONVENIENT, AND ADD SOME HUMOR: The Eagles use a few key techniques to get fans involved in recycling. Says Smolenski, "We don't want to be in a position where we're preaching because no one likes to be preached to. The important thing is to make it convenient and weave it throughout the organization to consistently apply the practices and procedures. On a game day we use prominent advertising about recycling and environmental responsibility. For example, in the men's restroom over all of the urinals, we have signs that say, 'Recycle your beer here, but recycle your bottle outside in our recycling containers.' "

TAKE ADVANTAGE OF LEAGUE NETWORKS AND CONTACTS: Teams are discovering new greening opportunities nationwide; take advantage of their knowledge to cut down on your research time. "There are representatives from about 16 NFL teams, maybe more, that participate in quarterly league-based green team calls. We talk about different programs we're doing and new ideas. It's an excellent open forum for getting direct contacts on different issues at clubs around the country that you can reach out to. It's a great resource," says Smolenski. "So now there are many more opportunities to figure out how to get better as a facility, how to start new programs and learn from your peers' experiences. We've had lots of different teams ask for advice and it's all win-win. We happily participate in those kinds of endeavors."

LOOK FOR INSPIRATION FROM OTHER INDUSTRIES: "We've picked up ideas not only from across the sports industry, but also from the cruise line industry," says Smolenski. "Our vice president of event operations was at a conference and the cutlery he used was a compostable type that he'd never seen before. So he grabbed a few extras and found out where they came from for us to check out. It was stronger than the different kinds of compostable cutlery we've tried here at the NovaCare Complex that would snap when our players used them. So now that we've found a stronger option, we've ramped up our use of the compostable cutlery."

"WE'RE NOT JUST TALKING THE TALK; WE'RE ACTUALLY WALKING THE WALK. IT'S NOT GREENWASHING. IT'S NOT SUPERFICIAL. WE BELIEVE IN GREENING FROM THE BUSINESS AND PHILANTHROPIC PERSPECTIVE.... WE'RE GOING GREEN TO BE A GOOD CORPORATE PARTNER IN OUR COMMUNITY," says Smolenski.

EVALUATE WHETHER LEED IS RIGHT FOR YOUR ORGANIZATION: "We've explored LEED options in the past. We felt that Lincoln Financial Field certainly fit the definition of a LEED-certified facility, but [certification] was expensive. We asked ourselves, was the designation worth the cost associated to get it? And in the end we decided we didn't need the LEED certification to justify what we were doing," explains Smolenski. "Achieving a LEED certification wasn't the reason why we were going green—which isn't meant as a knock; it's a very reputable accomplishment. We were going green to be a good corporate partner in our community, because it's the right thing to do. We made an internal decision that we didn't need LEED."

ENDNOTES

1 *Go Green! Executive Summary 2011* (Philadelphia Eagles, 2011), page 5, http://prod.static.eagles.clubs.nfl.com/assets/images/community/go_green_playbookv9.swf (accessed June 14, 2012)

2 Don Smolenski Biography, *Eagles Media Guide* (Philadelphia Eagles, 2012), paragraph 1, http://legacy.philadelphiaeagles.com/eagles_files/html/Smolenski_1.html (accessed June 14, 2012)

3 *Go Green! Executive Summary 2011* (Philadelphia Eagles, 2011), page 4, http://prod.static.eagles.clubs.nfl.com/assets/images/community/go_green_playbookv9.swf (accessed June 14, 2012)

CASE STUDY

AT&T PARK, HOME OF THE SAN FRANCISCO GIANTS

AT&T PARK
SAN FRANCISCO

BALLPARK STATS

Location: San Francisco, California

Began Construction: December 11, 1997

Opened: March 31, 2000

Seating Capacity: 41,915

Owner: China Basin Ballpark Corporation, San Francisco Giants subsidiary

Operator: San Francisco Giants

Venue Uses: MLB games (primary), international soccer and MLS games, collegiate football games, big-air ski and snowboard contests, concerts and private events

Construction Cost: $482 million (in 2012 dollars)

LEED Certification: Certified LEED Silver for Existing Buildings: operations and maintenance in April 2010

THE GIANTS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

Since opening in the spring of 2000, AT&T Park has been home to the San Francisco Giants Major League Baseball team, which owns and operates the facility. The ballpark doubles as a venue for concerts, corporate programs and other sporting events, including pro soccer games, collegiate football games, and even big-air ski and snowboard contests.

From day one the Giants have made environmental stewardship a business priority at the park by integrating sustainability into their company mission and operations. AT&T Park was the first major league ballpark to install a solar array and the first to receive LEED Silver Certification for existing buildings: operations and maintenance (EBOM). The Giants also divert the most waste from landfill of any professional sports venue in North America, with an 85.2 percent diversion rate for 2011. Here are some lessons from their greening successes to date.

WHY GO GREEN?

Even in the beginning, greening was a no-brainer for the Giants operations team. "It was not so much a question of why do it, but why wouldn't we do it?" says Alfonso Felder, senior vice president of facilities and a Giants front-office veteran of 16 years. "The reasons to go green and become more efficient are all so compelling," adds Jorge Costa, who has been with the Giants for 23 years and is senior vice president of ballpark operations, "but there's also an element of leadership, innovation and commitment that can't be overlooked."

Felder explains that sustainability and efficiency have always been core values for the Giants. "We're always pushing the envelope because innovation is a defining principle for us as an organization," he says. "We recognize that innovation and sustainability go hand in hand. Sustainability is one of the ways that we can be innovative as a business."

Playing in one of the United States' greenest cities was also a factor motivating the team to pursue greening. "One of the benefits we have is that we're in an incredibly enlightened and environmentally conscious city that really buys into the whole greening movement. People are cognizant of how their actions in and around their homes and businesses impact the environment," says Costa. "Given our location, we were committed to building in a very sustainable way from the beginning. It was the right thing for where we are and who we are as an organization."

WHERE TO START?

"We started our process of becoming green the minute we opened the park, and it's ongoing," says Shana Daum, vice president of public affairs and community relations for the Giants. "But it was really just baby steps at the beginning," admits Costa. "We began by trying to figure out how to reduce our electricity and water use."

"WE RECOGNIZE THAT INNOVATION AND SUSTAINABILITY GO HAND IN HAND. SUSTAINABILITY IS ONE OF THE WAYS THAT WE CAN BE INNOVATIVE AS A BUSINESS," says Alfonso Felder, senior vice president of facilities.

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LIGHTING RETROFITS

The Giants' lighting retrofit projects include:

- ★ replacing incandescent lights with compact fluorescent lamps ballpark-wide,
- ★ installing motion-sensor lighting,
- ★ replacing concourse signage lighting with an infrared-type high-output lamp controlled by a low-output ballast,
- ★ converting the 18 home batting cage sports lights to LEDs,
- ★ upgrading to a Mitsubishi Electric Diamond Vision HD scoreboard that is 78 percent more efficient than its predecessor, and
- ★ installing strip curtains in all walk-in refrigerators.

As with all companies, operations initiatives at AT&T Park start with the financials. "We have a cost savings evaluation phase for every new initiative that considers all of the financial impacts of a proposal," says Costa. "All of the decisions that we make are based on the return on investment, the outlay, and making sure we have enlightened systems management that we're constantly improving over time."

Ever since opening day in 2000, improvements in energy efficiency have been a daily priority of the ballpark operations team, especially regarding lighting retrofits. The Giants have already saved approximately 171,000 kilowatt-hours of energy—the equivalent of powering 25 average American homes for a year—with lighting upgrades throughout the park.

For example, the Giants recently converted the 18 large sports lights in their batting cage to LEDs. "You can already really see the benefit—they use less energy and the fixtures are going to last longer, saving on labor costs," says Costa. "But that was only 18 lights, and now we're working on upgrading the other 538 huge, expensive sports lights around the ballpark. It's a pretty significant budget hit in the short term, but we know we'll recoup the investment, even if it's a 5- to 10-year commitment."

Costa's advice? Plan ahead by calculating how the energy and labor cost savings will recover the upfront outlay. But most important, keep it affordable by doing incremental upgrades and working your way around the facility. "No one can do it all at once, unless they have unlimited resources," he says. "Most teams need to take on smaller, incremental initiatives that you orchestrate the right way, in concert with your whole system, to continue to make progress every day," he explains. "We take a dogmatic, methodical approach to greening. You've got to just make a base hit and work your way around while keeping the larger picture in mind."

CHALLENGES: OVERCOME AND ONGOING

The Giants continue to lead the industry in diverting waste from landfills. Thanks in large part to their jaw-dropping waste diversion rate, the Giants have won the coveted MLB Green Glove Award four years in a row for being the leading team in recycling and other sustainability initiatives. The Giants' aggressive recycling and composting program has ratcheted up their waste diversion rate from 57 percent in 2009 to 75 percent in 2010 to the all-time high of 85.2 percent in 2011.

"We faced some really hard challenges to get to where we are," says Costa. "When we were slapped with a statewide mandate that said all California businesses had to divert 75 percent of their waste from landfill, we thought, 'Really? How are we going to make that happen?' It was initially very onerous for us, but it's actually become a really important rallying point for our mindset about greening."

According to Costa, one secret to their success is hand-sorting waste. "We process all waste at the end of the game by hand as it comes through the loading dock," Costa says. "Even though it's costly and a dirty job, we get our money back and definitely see dividends."

Another tactic the Giants use is evaluating their entire waste management program as one system to identify inefficiencies and cost savings potential. "There is a constant yin and yang of cost evaluations with all of your partners on a systemic level," explains Costa. "For example, to upgrade our loading dock we proposed to spend something like $60,000 to revamp the layout, so we needed to calculate how we would recoup that investment. We worked with Recology, our waste partners, to minimize the number of trash hauls and dumping costs. We reevaluated and economized on the bags and bins we're using. We also thought more systemically about savings around the ballpark by cutting down on broom costs and labor costs."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ The Giants' ballpark was the first in the major leagues to receive LEED Silver certification for existing buildings: operations and maintenance.
- ★ In 2007 AT&T Park became the first MLB ballpark to install a solar array. At 123 kilowatts, it provides enough power to supply 5,200 homes (avoiding 360,000 pounds of greenhouse gases) and generates green energy for PG&E customers across San Francisco.
- ★ The Giants achieved 100 percent waste diversion ballpark-wide in March 2012 and an 85.2 percent annual waste diversion rate for 2011. The team recycles or composts cans, bottles, plastic cups, cardboard, paper, wood pallets, electronic components, lightbulbs, batteries, cooking grease, food waste and grass clippings.
- ★ Close to 100 percent of drinkware and food packaging sold at the ballpark is recyclable or compostable.
- ★ An irrigation clock receives weather data and couples it with site data to establish zone watering times, saving 33 percent to 50 percent in irrigation water use.
- ★ Amendments to the infield mix (from 66 percent sand, 20 percent silt and 14 percent to clay to 50 percent sand, 25 percent silt and 25 percent clay) have reduced field watering by 33 percent.

Thanks to the Giants' new Recycle Processing Center, Costa is now setting the waste diversion bar even higher and has already seen glimpses of greater success. "This year we're aiming to get to a 90 percent average annual diversion rate, which is a very aggressive goal."

In fact, in March of this year the Giants achieved the herculean accomplishment of 100 percent waste diversion, though it was during the off-season. During March the Giants completely overhauled their 2011 playing field, processing approximately 3,000 tons of soil to become recycled topsoil and giving all of the sand to the San Jose Giants, their minor-league affiliate, for use on their infield.

"Now that we've reached 100 percent diversion once, I want to keep the pedal to the metal and get as close as we can every month," says Costa. "I can't stress it enough: You are never done. I will never say to my staff, 'We're in a really good spot.' I always say, 'OK, this is where we're at, now how can we get to the next level or a higher goal? How can we get better by refining our systems even more, making them more efficient and more affordable?' Today, a 75 percent diversion rate would be a failure."

"NOW ALL OF OUR DRINKWARE IS RECYCLABLE AND [THE] FOOD PACKAGING [WE USE] TENDS TO BE COMPOSTABLE. BY SIMPLIFYING THAT MESSAGING, YOU CREATE A MORE EFFECTIVE SYSTEM. LESSONS LIKE THAT YOU NEED TO LEARN ALONG THE WAY," says Felder.

Fan adoption of recycling and composting was not always smooth sailing for the Giants. "Like many facilities, we've had the challenge of learning what works and what doesn't work in terms of managing our waste stream," Felder says. "For example, there was a time when people were really pushing for compostable plastic cups, but we found that it created some conflict and confusion within the public."

Felder explained that the Giants, among other teams, rejected the compostable cups after testing them at the ballpark and finding that fans didn't compost them and that they consistently contaminated the waste stream. "So the prevailing wisdom changed, and now all of our drinkware is recyclable and [the] food packaging [we use] tends to be compostable. By simplifying that messaging, you create a more effective system. Lessons like that you need to learn along the way."

Yet even with a more efficient system and educated public, Costa warns that there will always be more people to educate, remind or prod to get the job done. Patience is key. "Despite all of our outreach and accomplishments, I still see fans struggling, not understanding which items are compostable or recyclable. Just yesterday I spent five minutes explaining to a fan what goes where and why it's important to separate," he adds. "It's crucial to educate both our staff and our fans about these issues, not only because fans are really important for helping us achieve our diversion goals, but also because they'll go home and use that same knowledge elsewhere."

The same is true for business partners. Costa points out that working closely on greening initiatives with concessionaires is particularly important, though it can also present challenges. The main problem he has encountered is how to source affordable, specialized products from large concessionaires that buy much of their product in bulk for their many accounts spread across the country. "It's very costly to start making site-specific orders to get specialized products [like compostable serviceware] that are acceptable for certain locations like San Francisco," says Costa. "And it's particularly challenging when many of the concessionaires' other accounts are in cities that aren't as cognizant of the product impacts or don't have local mandates. It's something that we're still really struggling with, though we've made a lot of inroads."

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LESSONS FROM THE FIELD

CREATE THE RIGHT WORK ENVIRONMENT: For those just getting started or struggling to get green initiatives off the ground, Costa suggests going back to basics by creating the right work environment for success. "You've got to really circle the wagons. You need to create a different mindset and environment based on cooperation," he explains. "Meet and talk through every aspect of these issues, from the financial to the emotional to the practical to the fundamental realities of your business and partners."

ESTABLISH A DIVERSE AND DEDICATED GREEN STEERING COMMITTEE (ESPECIALLY FOR PURSUING LEED): Start by getting the right people together. "We'd recommend establishing a steering committee made up of a variety of people from many departments within the company and from external partners that come together and are dedicated to the process," says Costa. "The desire and the resources all need to be in alignment to make it happen. No single person can get this done. You need a collaborative group of people with the vision, passion and commitment to put their money where their mouth is. That takes courage and conviction."

INVOLVE ALL PARTNERS: Given the complex nature of ballpark services, the Giants involve all venue stakeholders including PG&E (sponsor), ABM Services (building and facilities management), Centerplate (hospitality and concessions), Toro Irrigation (landscape management), and Recology (waste management) to ensure successful ballpark-wide integration of green initiatives. They also recommend capitalizing on the opportunity to share your green story by having your partners assist you in telling it. Involving stakeholders will increase the volume of your voice and the penetration of the message.

HOLD REGULAR GREEN MEETINGS TO STAY ON TOP OF MARKET TRENDS: Costa likens the rapidly changing green-tech space (such as the lighting industry) to the Apple iPad. "What's good yesterday may not be so good tomorrow, and you find yourself constantly questioning when to invest in upgrades if newer and newer versions continue to be released," he explains. "The iPad is actually a great analogy for what it feels like trying to stay on top of the many increasingly efficient technologies available in the marketplace." For instance, Felder points out, "the packaging that was available five years ago wouldn't have allowed us to be where we are now."

The Giants use regular meetings with their partners to keep themselves informed on new products. "We do evaluations of our product use during every home stand and have regular meetings with our partners on an ongoing basis. We use a combination of internal staff research and the advice of external partners like PG&E, Recology and Centerplate to vet the market for new products and technologies," says Costa. "Centerplate is a particularly helpful resource because they are able to learn a lot from working with a lot of venues across the country on these issues."

"We also look for technological trends in the marketplace," adds Felder. "ABM, our engineering group, has done a lot of work with us on lighting and does a lot of research on electronic products for us."

COORDINATE WITH OTHER BUYERS TO HELP WITH PRODUCT COST AND AVAILABILITY: Partner with other teams, venues and even other companies in your area to harmonize purchasing requests and build the market for environmentally friendly products.

GOING GREEN IS AN INVESTMENT: "The single greatest issue that we face today is that it's not inexpensive to go green. That's just being flat-out honest," say Costa. "You will need to spend some money." Though Costa believes strongly in the benefits of increased efficiency (including resource savings, financial savings, favorable press, brand enhancement, environmental benefits, public health benefits and the strengthening of community ties), he says, "You are constantly balancing cost and the willingness of your partners to adapt."

"Achieving LEED certification is a six-figure application process and requires you to devote staff resources almost exclusively to the LEED application," points out Costa. "It took us about 14 months from the time we started at the beginning of 2009 until we got certified in March of 2010." Felder agrees that large projects like pursing LEED certification may be difficult to justify financially in the short term. "You could say that LEED certification was an expense that might have been hard to justify, but what we're finding is that it really does pay off over time."

PURSUE GREEN INITIATIVES INCREMENTALLY: It's often more affordable to pursue incremental upgrades and work your way around a facility. "No one can do it all at once, unless they have unlimited resources," says Costa. "Most teams need to take on smaller, incremental initiatives that you orchestrate the right way, in concert with your whole system, to continue to make progress every day," he explains. "We take a dogmatic, methodical approach to greening."

CASE STUDY

AMERICANAIRLINES ARENA, HOME OF THE MIAMI HEAT

ARENA STATS

Location: Miami, Florida

Began Construction: February 6, 1998

Opened: December 31, 1999

Seating Capacity: 19,600

Owner: Miami-Dade County

Operator: Basketball Properties Ltd.

Venue Uses: NBA games, WWE wrestling matches, family shows and concerts

Construction Cost: $297 million (in 2012 dollars)

LEED Certification: Certified LEED for Existing Buildings: Operations and Maintenance in April 2009

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

The Miami HEAT have been sports industry leaders in green building initiatives and comprehensive tracking of facility-wide resource use since AmericanAirlines Arena became LEED-certified for existing buildings: operations and maintenance (EBOM) in the spring of 2009. For the better part of a year the HEAT worked on enhancing their operations in a race against the Atlanta Hawks to win the first LEED Certification for an arena in the National Basketball Association. The showdown culminated in a dead heat when the Green Building Certification Institute, a subset of the U.S. Green Building Council, awarded AmericanAirlines Arena and Philips Arena, the home of the Hawks, LEED certification on the same day, April 7, 2009.

With a LEED certification under their belt, and many cost benefits and positive press mentions to boot, the HEAT are now working toward LEED recertification in 2014, which requires improving on all of their 2009 efficiency achievements.

"IT'S A POINT OF DIFFERENTIATION FOR US FROM A BUSINESS PERSPECTIVE. IT PROVIDES A PLATFORM FOR US TO ATTRACT ACTS AND ENTERTAINMENT THAT WANT TO PLAY IN GREEN VENUES," says Eric Woolworth, president of the HEAT Group's business operations.

WHY GO GREEN?

According to Jackie Ventura, operations coordinator for the HEAT Group, the direct benefits of greening and LEED certification include financial savings, attracting green-based sponsorships, brand enhancement, competitive advantage, raised community profile and improved company culture. "Sustainability equals savings. In one year, thanks to our greening and responsible energy consumption measures, we saved $1.6 million," says Ventura. "We also attracted about $1 million in new corporate sponsors, which include Home Depot and Waste Management, who aligned with our greening efforts as sponsors of our LEED initiative. Being environmentally conscious improves our brand's image so that we now talk with companies that never would have approached us before, such as Johnson & Johnson and Georgia Pacific."

The HEAT also include their green accolades in their pitch to attract performing artists to their arena. When the team first announced its LEED certification and ongoing commitment to greening in 2009, Eric Woolworth, president of the HEAT Group's business operations, said, "It's a point of differentiation for us from a business perspective. It

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STANDOUT GREENING ACCOMPLISHMENTS

- ★ The HEAT's energy efficiency initiatives have enabled the AmericanAirlines Arena to consume 53 percent less energy than the average facility of similar size and use, according to EnergyStar's Portfolio Manager.
- ★ The organization replaced 240 lamps in the arena's concession stands and merchandise locations with compact fluorescent lights (14-watt bulbs replaced 60-watt bulbs). This move saves $976 annually and recouped the capital investment in two years.
- ★ The team implemented a building automation system (provided by Johnson Control) to monitor and control heating, cooling and ventilation.
- ★ The HEAT reduced the heat island effect and saved energy by using a more reflective "white" roofing and underground parking.
- ★ The team also added 9,161 square feet of canopies to reduce the heat island effect.
- ★ In 2009, the HEAT achieved a 16.7 percent reduction in potable water use and saved more than $5,000 in water costs through low-flow faucet and toilet upgrades and by increasing plumbing efficiency.
- ★ The HEAT save almost $11,000 annually due to greater irrigation efficiency. All irrigation of planters and landscaped areas is done by a drip system or a soak system that applies water directly to the roots, and all lines have low-flow nozzles. Also, timers are used so that irrigation takes place in the middle of the night in order to minimize evaporation.
- ★ The HEAT permanently installed water meters to measure the consumption of potable water and water used in irrigating all landscaped areas. The meters are monitored on a weekly basis.
- ★ The HEAT established an environmentally preferable purchasing policy and a solid waste management purchasing policy (43 percent of purchases are sustainable).

provides a platform for us to attract acts and entertainment that want to play in green venues."

Woolworth explained that the HEAT pursued greening because they understood the influence their organization has in the community and marketplace. "Achieving LEED certification is a great affirmation of the AmericanAirlines Arena's commitment to energy conservation and environmentally responsible operations," said Woolworth at the announcement of the LEED certification. "Being among the first arenas in the U.S. to be LEED-certified, we hope to inspire businesses of all kinds to think green and make a positive impact on our earth."[1]

The HEAT became devoted to greening not only to show community leadership, improve the efficiency of their operations and benefit the environment, but also because the team wanted to seize the opportunity to be a trailblazer for professional sports. "The HEAT Group, the business operations behind the Miami HEAT team, prides itself on being an innovative organization," says Lorrie-Ann Diaz, director of marketing communications. "As a professional sports franchise, being competitive is part of who we are and what we do, and we're proud to be one of the first major professional sports facilities to achieve the incredibly important LEED certification."

Greening enabled the HEAT to attract positive press and create new community-based opportunities. "We knew that being the first NBA arena to be LEED-certified would attract great publicity," says Ventura, "but as we discovered that it was an exciting way to engage with the city and with the community, we realized how important it was to make greening a big part of our game. Our green work is a great avenue to introduce these concepts to people who don't have access to or don't yet care about these issues. It's a domino effect."

Ventura stresses the importance of magnifying the green message by leveraging the HEAT's brand. "We have so much power in this business. We have incredible access to so many people on a daily basis," she says. "We had over 1.5 million visitors to sporting and entertainment events last year alone. If you impact half of those people and they share it with a couple of other people, the impact adds up. Pretty soon we'll be doing a lot of good."

Manny Diaz, the mayor of Miami at the time of the HEAT Group's LEED certification, promoted the HEAT's greening work as a positive model for local businesses. "The AmericanAirlines Arena is a catalyst for all Miami businesses to invest in a greener future," he said. "The arena's commitment to the earth and our community paves the way for other companies in downtown Miami to follow that path and make a lasting difference."[2]

WHERE TO START?

The HEAT Group first learned about greening opportunities from the NBA head office. In 2007 the NBA established a partnership with the Natural Resources Defense Council (NRDC) to enhance their environmental profile. As part of this program, during the summer of 2008 the NBA worked with NRDC to establish the Commissioner's Initiative on Sustainable Arena Operations and Team Practices. The league also circulated the NRDC Greening Advisor to help all NBA teams learn how to become greener.

The NBA's environmental commitment and NRDC's resources motivated the HEAT Group to find out whether they could achieve LEED certification. "When NRDC got together with the NBA and made some league-wide environmental recommendations, it really kick-started our interest in greening," says Ventura. "We began by looking into LEED to see if we could get certification. Lo and behold, just by doing the checklist on the U.S. Green Building Council website, we were pretty confident that we could pursue

THE HEAT'S LEED CERTIFICATION COST-SAVING ANALYSIS BREAKDOWN

- Total LEED Project Cost: $73,384
  - Registration: $600
  - Certification: $15,000
  - Expedited evaluation (optional): $10,000
  - 550 internal staff hours: approx. $47,592
  - Various manuals: $192
- Total LEED Project Annual Savings: $1,616,480
  - Energy savings: approx. $1.6 million
  - Lighting annual savings: $976
  - Efficient plumbing fixtures: $5,440
  - Responsible landscaping: $10,822

COST SUMMARY

- Total Expense: –$73,384 ($25,792 out-of-pocket)
- Annual Savings: +$1,616,480
- Green Sponsorship: +$1,000,000
- **Full return on investment within one year, plus millions in ongoing annual savings.**

"IT WAS GREAT TO SEE THAT BY BEING FISCALLY RESPONSIBLE WE WERE BEING SUSTAINABLE AS WELL," says Jackie Ventura, operations coordinator for the HEAT Group.

certification."

To work on the LEED application, the HEAT Group put together a "green team" made up of internal staff members and Laura Crave, a LEED Accredited Professional and director of marketing for Dade Paper, one of the HEAT's major vendors. "As LEED certification is such an important element of our green mission, we decided to complete the project in-house, and luckily, most of the staff in our operations department have been part of the HEAT Group for a long time," says Ventura. "Everyone had a solid foundation in the operation of the building, so we knew this was something we could pursue without third-party involvement."

According to Ventura, the HEAT recognized the value of training their staff in efficient building practices while pursuing certification. "Our team of facility managers, engineers and maintenance staff took ownership of the project and made the commitment to become LEED experts themselves," she says. "We were able to complete the process in record time, and the accomplishment was more meaningful because our own team of dedicated professionals made it happen."

Thanks to strong support from the executive staff, particularly Eric Woolworth and general manager Kim Stone, the HEAT Group was able to register the AmericanAirlines Arena for LEED certification on November 18, 2008, just a few months after learning about the LEED opportunity. "Everyone was really on board with getting the initiative done. Our goal was to unveil our certification during the NBA's Green Week in April 2009. and our president and business operators said, 'Make this happen' and 'You have my support,' " says Ventura. "This required that the internal green team's regular duties be delegated to other staff members in the interim. The staff all supported being more sustainable and were happy to contribute to the project wherever they were needed."

The HEAT started with the LEED checklists of prerequisites and credits required to achieve EBOM certification. "We began with the prerequisites because obviously without those you can't follow through with certification," explains Ventura. "We were surprised that we already qualified for all of the LEED prerequisites because, honestly, most of our prior decisions were fiscally motivated."

CHALLENGES: OVERCOME AND ONGOING

Pursuing LEED certification requires investment, including significant up-front capital and staff time. However, the costs associated with green upgrades and LEED certification are minimal relative to the significant utilities savings available for a major facility like the AmericanAirlines Arena. "We spent $1,594,309 during the 2008 calendar year. If we ran the AmericanAirlines Arena at the current national average, we could potentially be spending approximately $3,010,000 annually on energy consumption each year," explains Ventura. "So thanks to our greening work and responsible energy consumption, which is 53 percent more efficient than the average arena, we now save approximately $1.6 million on energy costs annually."

Ventura credits the HEAT's efficient and straightforward LEED application process to consistent and knowledgeable staff, impeccable recordkeeping, responsible utility consumption and easy-to-use electronic blueprints. "We found that most of our practices were already LEED compliant," she says. "We have always been very vigilant about tracking our consumption with electricity, water, gas, et cetera. I have spreadsheets and electronic records of all facility-wide consumption from the opening of the building in 1999, so we were confident that we would meet all of the LEED baselines."

The greatest challenge the HEAT faced was accurately and efficiently completing all of the LEED application paperwork. "We found filling out all of the paperwork in-house was more of a challenge than any other," says Ventura. "Many of the LEED credits required us to put our typical (and some new) practices, like buying recycled content and EPA-recommended efficient products, down on paper as

"WHILE LEED WASN'T NECESSARILY THE IMPETUS FOR A LOT OF OUR EFFICIENCY PROJECTS, IN THE LONG RUN IT HAS SERVED AS THE REASON WHY WE KEEP ADHERING TO AND IMPROVING UPON THE GREENER PRACTICES WE HAD IN PLACE BEFORE," says Ventura.

formal policies. None of our prior standard operating procedures addressed these types of practices, so LEED served the dual purpose of allowing us to update our SOPs." The LEED process motivated the HEAT Group to advance environmentally friendly purchasing across more product categories, including cleaning supplies, all paper products, lighting and electronics.

Ventura attributes the ease of implementing green purchasing programs at AmericanAirlines Arena to the HEAT's longstanding vendor relationships and loyalty. "We are very loyal to our vendors. They are also loyal to us and make sure we are the best we can be," she says. "For example, one of our suppliers, Dade Paper, has been in the building since day one. They were really great about going through all of our requirements and communicating about upcoming products. They assisted us in a seamless transition to new products, such as 100 percent recycled paper towels and EPA-recommended foam soap."

Thanks to these strong relationships, the HEAT Group was also able to rely on partners for sponsorship of its LEED-based green initiatives. "We've had an account with Home Depot for about 10 years and they sponsored our first year of LEED certification," says Ventura. "Waste Management has also been in the building since day one. They were very supportive of our LEED application process as well and continue to partner with us to significantly expand our recycling programs. They provide all of the balers, toters, garbage cans and signage for branding. They have also sponsored community outreach programs like our e-Recycling drive in April 2012. The recycling proceeds from all of the electronics went directly to Miami-Dade County Public Schools to aid in their efforts to upgrade technology in classrooms across our county. "

The HEAT's vendors have played a key role in watching the market for new technologies as well. "We make most of the building products purchasing decisions internally for things like lightbulbs and office supplies," explains Ventura. "In terms of our cleaning supplies and larger pieces of equipment, we rely on our vendors to bring us new technologies as they come out. We are very lucky that we have a good relationship with our major vendors, and they are very vigilant about bringing these new products to us. They are very aware that we have high standards and are working on recertification."

The HEAT Group has already started working toward LEED EBOM recertification in 2014, which requires improving on all 2009 green initiatives. This time the organization is aiming for LEED Silver certification. "For recertification, 2009 is our baseline. Our consumption must stay even or below our 2009 figures and we need to implement new green initiatives," Ventura explains. "For example, we've completed installation of virtual frequency drives on the air handlers and have begun adding them to our chilled water pumps as well. We upgraded our hot water gas boiler to a high-efficiency model, which has effectively reduced our gas consumption to a third of what it was in fiscal year 2009—49,907 therms versus 15,574 therms." The HEAT Group has also been upgrading more of its arena's lights to LEDs and purchasing office products with a higher percentage of post-consumer recycled content. "Switching up to LED lightbulbs, which are now more readily available, is logical because although they cost more initially, the extended life expectancy will reduce replacement and long-term spending and will help us earn recertification," says Ventura. "We are very conscious of the decisions we make to ensure they are in line with the recertification process. Thanks to our comprehensive data collection and green building success to date, we can also easily justify new greening projects by showing our executive staff a cost–benefit analysis of why an up-front investment is a good idea in the long term."

LESSONS FROM THE FIELD

GREENING AND LEED CERTIFICATION HAVE MULTIPLE DIVIDENDS; YOU WILL LIKELY RECOUP YOUR INVESTMENT: According to Ventura, the direct benefits of greening and LEED certification include financial savings, green-based sponsorships, brand enhancement, competitive advantage, raised community profile and improved company culture. Despite devoting more than $70,000 to their LEED application, the HEAT's return on investment for all of the green projects included in their LEED process was less than one year, with millions in resource savings since then. "Sustainability equals savings. In one year, thanks to our greening and responsible energy consumption measures, we saved $1.6 million," Ventura notes. "We also attracted about $1 million in new corporate sponsors, which include Home Depot and Waste Management, who aligned with our greening efforts as sponsors of our LEED initiative."

USE THE READILY AVAILABLE ONLINE RESOURCES TO BREAK DOWN THE GREENING PROCESS: "The most important takeaway is not to be overwhelmed by the process, particularly for LEED," says Ventura. "When you begin it can seem very overwhelming, but NRDC, the U.S. Green Building Council, and the EPA have a ton of resources for people trying to be greener and/or achieve LEED certification. It is not as overwhelming or daunting as it seems if you have your information in order and use these resources as a guide."

"WE TREND OUR EVENTS TO SEE WHEN CONSUMPTION PEAKS FOR CHILLED WATER AND ELECTRICITY SO THAT WE CAN ADAPT AND BECOME MORE EFFICIENT," says Ventura. **"IF YOU DON'T HAVE THAT INFORMATION AVAILABLE TO YOU, THE BASIC DATA, THERE IS NO WAY TO GET A HANDLE ON WHAT YOU'RE USING AND HOW TO IMPROVE."**

TRACK YOUR RESOURCE USE FACILITY-WIDE AND KEEP COMPREHENSIVE RECORDS: "We've been keeping records since day one. We know how much we've consumed and spent since the day we opened," says Ventura. "It has been so helpful to create those baselines for LEED certification. We have numbers, graphs, consumption trends and demand analysis for all of our utilities that can be used as a quick reference guide as needed. We also use the data to help us gauge our budget projections and monitor our peak consumptions."

USE ELECTRONIC BLUEPRINTS OF YOUR FACILITY: "We recommend having accurate final blueprints for your facility. We use computer-aided design. The blueprints are extremely helpful for calculating square footage and dividing building space by type," explains Ventura. "Some LEED credits require you to upload blueprints, so having electronic versions—and someone who can manipulate the documents to showcase only the areas requested for LEED—is very beneficial."

THERE ARE PLENTY OF GREEN ALTERNATIVES TO LEED CERTIFICATION: LEED isn't the only way to be greener and save money. "Form an eco-committee, join EPA's EnergyStar program, increase recycling, reduce water and paper use, adopt LEED's green cleaning requirements, green your supply chain, promote carpools, use renewable energy and raise public awareness," suggests Ventura.

ENGAGE FANS WITH GREEN ACTIVITIES ON THE CONCOURSE: "We had Pepsi's Dream Machine on the concourse. Fans and employees could deposit plastic bottles and turn them into points, which could be redeemed for coupons at local establishments and prizes including mini HEAT souvenirs," says Ventura. "We installed the Dream Machine recycling attraction in partnership with PepsiCo, and the revenue from recycling the plastic bottles and aluminum cans was donated to funds that lend support to U.S. veterans with disabilities, which was another added incentive for fans to participate."

ATTRACT ADDITIONAL PRESS BY HAVING MULTIPLE UNVEILINGS AT ONCE: "We were able to extend our 'green limelight' to about three months by coordinating multiple unveilings at once," says Lorrie-Ann Diaz. "We unveiled our LEED certification three weeks after our 3,400-square-foot, low-energy-consumption LED screen was installed and continue to promote our certification on the front fascia of the building."

ENDNOTES

1 "AmericanAirlines Arena Awarded Prestigious LEED® Green Building Certification." Heat News, NBA.com (April 15, 2009). www.nba.com/heat/news/aaarena_awarded_LEED.html (accessed June 19, 2012).

2 Ibid.

CASE STUDY

SAFECO FIELD, HOME OF THE SEATTLE MARINERS

BALLPARK STATS

Location: Seattle, Washington

Began Construction: March 8, 1997

Opened: July 15, 1999

Seating Capacity: 47,860

Owner: Washington-King County Stadium Authority

Operator: Baseball Club of Seattle LP

Venue Uses: MLB games, amateur baseball events, collegiate football events, and corporate and political events

Construction Cost: $722 million (in 2012 dollars)

THE MARINERS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Seattle Mariners have been leading the environmental charge in stadium operations ever since Scott Jenkins, vice president of ballpark operations, joined the team midseason in 2006 and immediately set out to make the stadium's operations more efficient. Since then, the Mariners have saved nearly $1.5 million in energy costs, and Safeco Field boasts the lowest energy intensity of all the Major League Baseball stadiums that participate in EPA's EnergyStar program. Jenkins and the Mariners are founding members of the Green Sports Alliance and have received numerous awards for Safeco Field's environmental initiatives, including the Washington Green 50 Special Leadership Award given by Seattle Business magazine in 2011.

"IT'S AN OPPORTUNITY TO REDUCE YOUR COSTS, GREEN YOUR BRAND AND REDUCE YOUR ENVIRONMENTAL IMPACT. THOSE ARE THE THREE BIG REASONS I THINK WE SHOULD BE DOING THIS; WHY [THE MARINERS] ARE; AND WHY WE'RE GETTING SUPPORT AT THE LEAGUE LEVEL, THE EXECUTIVE LEVEL, THE OWNERSHIP LEVEL, FROM THE STAFF AND FROM THE FANS," says Scott Jenkins, Mariners vice president of ballpark operations.

WHY GO GREEN?

In the simplest terms, "Greening is good for the bottom line," says Jenkins. But beyond just cost savings, the Mariners see greening as a business opportunity that supports a triple bottom line. "It's an opportunity to drive financial performance, reduce your costs and green your brand, which gives you the ability to sell to more people and build a deeper relationship with your customer," Jenkins explains. "Reducing your environmental impact is an opportunity to do the right thing as a business." Jenkins adds that greening in professional sports is coming to be expected by fans: "A growing segment of the population is interested and concerned about sustainability, so I see the trajectory of green as growing rather dramatically."

WHERE TO START?

The Mariners' environmental initiatives began when Jenkins arrived in 2006. Fortunately for the Mariners, Jenkins brought a wealth of greening knowledge and experience from his tenure with the Philadelphia Eagles, where he worked directly with NRDC to address the environmental impacts of the team and stadium operations starting in 2003. Jenkins and his operations team began by identifying the biggest environmental impacts at the stadium, and which of these impacts the ballpark had the most influence over. "By doing a carbon footprint analysis it became really apparent that the biggest issues around events were fan travel—the guests coming to and from our stadium—and the energy and water we consumed at our buildings," Jenkins says. By targeting areas with the biggest cost savings opportunities, Jenkins and his team were able to make the business case for environmental initiatives at the stadium. "Right away, the areas we could work on were energy conservation and water conservation, which definitely have bottom-line benefits."

Developing a baseline of their current performance was vital for the Mariners. Jenkins explains, "Here in Seattle, the one really key component was having metrics to be able to understand how you were performing over time and set some goals for improving that. Fortunately we had a good history of data for the life of the building—we could go back month by month to see what we consumed and what we sent to the landfill. So we really started with that base knowledge of how we performed in the past, business-as-usual, and what we thought we could accomplish in a new way of doing business."

Looking at this baseline data, Jenkins and the operations team decided to focus on areas where they had the most control and where the biggest savings opportunities were—which were primarily in energy use. Jenkins wanted to find out how much was being spent on utilities and to set a new low standard for energy consumption. Making the financial argument went hand in hand with reducing consumption. "I challenged the engineering staff by saying, 'Look, we're going to try to save $100,000 over the next year and here's how we're going to do it. First of all, we all need to realize what we spend on a daily basis on gas and electric energy in this building.'

"It turned out we were spending more than $4,000 a day on energy and water. I said, 'Imagine if every day you went home from work and went to your mailbox and there was a utility bill that said you owe $4,000 today. And then tomorrow you go to the mailbox and get another bill that says you owe $4,000 today.' All of a sudden the invisibility of the cost of those things became apparent. This stuff is money."

By bringing these daily costs to their attention, Jenkins hoped to motivate the operations team to reduce unnecessary energy use. "It might be invisible when the electrons flow and the doors open and the heat goes out," he says. "But the reality is we're getting a gigantic bill for that, and if we can be smarter about how we run this, like we run our own houses, we can do some big things."

This approach has been highly successful. Since 2006, the Mariners have reduced their energy intensity at the ballpark by 25 percent. Initially these gains involved the lowest-hanging fruit. "It was all low-cost, easily achieved things," Jenkins says, "mostly better use of automation, better discipline in turning things off when they're not being used, really low-cost stuff like aerators on faucets, weather

STANDOUT GREENING ACCOMPLISHMENTS

- Through numerous energy efficiency efforts, the Mariners saved approximately $1.5 million in utilities costs (electricity, natural gas, water and sewer) from 2006 to 2011 by reducing natural gas use by 60 percent, electricity use by 30 percent and water use by 25 percent.
- The team replaced its old incandescent bulb scoreboard with a new LED scoreboard, which lowered annual electricity consumption by more than 90 percent (from 1.2 million kilowatt-hours to 130,000 kilowatt-hours) and reduced energy costs by $50,000 per year.
- Energy initiatives have resulted in an average annual energy savings of $298,500 per year, with savings as high as $350,000 per year, compared with expenditures in 2006.
- Energy reductions have reduced carbon dioxide-equivalent emissions by 21.2 million pounds a year.
- The Mariners established zero waste goals, which increased waste diversion rates from 12 percent in 2006 to 81 percent in 2011, saving $95,000 in landfill costs in 2011 and reducing greenhouse gas emissions by 10.4 million pounds (CO_2-equivalent) from 2006 to 2011.
- The Mariners' purchasing policies prioritize greener products, including:
  - Hand towels and toilet tissue made from 100 percent recycled fiber with a minimum of 65 percent post-consumer content (pcc)
  - Office paper made from 100 percent pcc recycled fiber
  - 97 percent of all custodial supplies certified by entities such as Green Seal and Ecologo

"DATA COLLECTION ILLUMINATES HOW YOU PERFORM. YOU APPROACH IT COMPLETELY DIFFERENTLY THE MINUTE YOU START TO MEASURE AND KEEP TRACK OF THINGS AND COMPARE YOURSELF TO OTHERS. IN OUR INDUSTRY, IT'S ALL ABOUT STATISTICS AND WHERE YOU ARE IN THE STANDINGS; THAT'S THE CORE MISSION OF OUR BUSINESS ON THE PLAYING FIELD. AND THAT COMPETITIVE NATURE AND THE DESIRE TO KNOW WHERE YOU ARE TRANSLATES TO THE ENVIRONMENTAL SIDE OF THINGS QUITE NATURALLY," says Jenkins.

Safeco Field Greening Program Awards

- ★ **2011 Recycler of the Year** (Business Generator), Washington State Recycling Association
- ★ **2011 Venue Excellence Award**, International Association of Venue Managers
- ★ **2011 Washington Green 50 Special Leadership Award**, *Seattle Business* magazine

stripping on doors, some upgrades on the controls. And lo and behold, that $100,000 I wanted to save turned into $275,000 in the first year."

Getting to the next level of gains required some outside help. "After the easy [improvements], then we started to do some engineering studies to figure out what we could do if we invested more money and took a look at the infrastructure we had. We subsequently spent about $1.5 million on a lot of retrofits," Jenkins notes. These improvements included retrofitting with low-flow urinals (which use 1 pint of water per flush, rather than 1 gallon), recommissioning all HVAC systems, upgrading controls and equipment, and upgrading lights. Despite the higher up-front cost, these retrofits quickly paid for themselves. "You can get payback for some of those investments in as little as two, three or five years," says Jenkins. "In tough economic times, it sure is nice to know you can invest x amount of money and guarantee your rate of return in a short amount of time and then it's all gravy after that. Certainly utility rates are not going down, they're going up, sometimes in double digits, so we've really insulated ourselves from future increases in costs by reducing our usage."

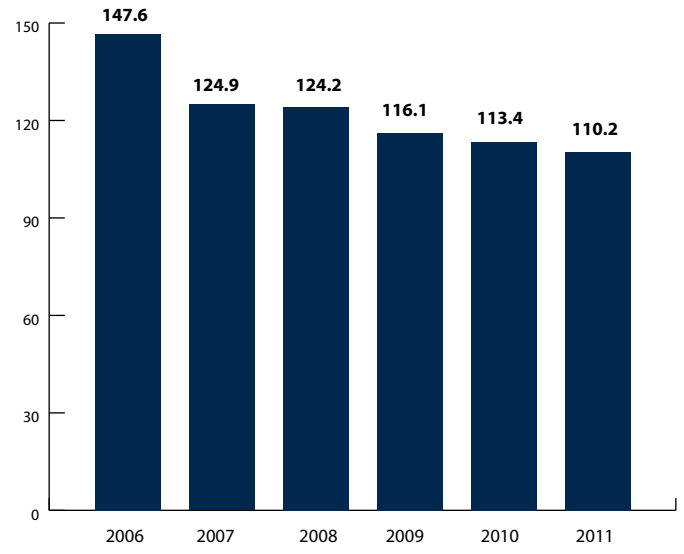
CHALLENGES: OVERCOME AND ONGOING

The next area the Mariners tackled was waste; the stadium's landfill diversion rate was only 12 percent when Jenkins arrived in 2006. While the initial cost savings from waste diversion were not as high as the savings from the energy initiatives, Jenkins viewed the recycling program as a visible way to connect greening initiatives with the fan community. "The recycling piece of it is big in terms of engagement with the fan, so that's a natural place to start the conversation with your customers and employees. It's one of the few things that everybody participates in," he explains.

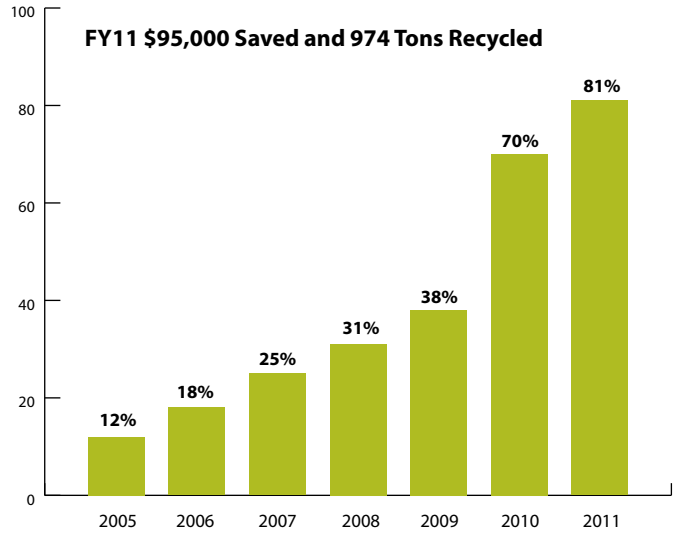
The Mariners now boast an impressive diversion rate of 81 percent, but it wasn't easy getting there. Steadily increasing recycling containers, training staff, and sorting post-collection still left the team's diversion rate hovering around 38 percent in 2009. Jenkins recalls admiring the achievements of other teams (including the San Francisco Giants, whose recycling program was diverting around 85 percent of stadium waste), but Safeco Field had separate bins for compost, trash and recycling that all had to be hand-sorted after a game. "I thought, I just can't justify that much cost in labor to sort. But if I manage the supply chain side of it, I don't have to do that much sorting," says Jenkins.

One key solution to the sorting problem was to switch food and beverage packaging and serviceware entirely to compostable or recyclable products and get rid of the garbage bins altogether. "We decided to control our own destiny and do it from the supply side, making sure that most of our serviceware is compostable. So we basically took the garbage away so fans no longer have that option. They have the choice of a compost bin and a bin for bottles and cans. If I don't have a landfill container for them, they can't put compostables or recyclables in it, so I don't have to sort it out. I like to think we've kind of outsmarted people a little bit."

Safeco Field Weather Normalized Energy Use Intensity
kBtu/Sq. Ft.



Annual Recycling Rate



After making the switch to compostable products, the Mariners' diversion rate quickly jumped to more than 70 percent. But there were a few hitches along the way. "The first year that we switched to getting rid of 'landfill containers' on the concourse, our Pepsi cup was lined with plastic, and our pizza box had a cellophane window in it, so two years ago we had to sort out every Pepsi cup and pizza box—and you can't imagine how many of those you sell at a ballpark in a year," Jenkins recounts. It was a learning process. "We didn't have the supply chain set up right yet—we were at a 71 percent recycling rate, but every cup and box we had to sort out and send to the landfill."

By 2011, Jenkins had solved some of these problems by working directly with the vendors, which brought Safeco's recycling rate up to its current level of 81 percent. But the Mariners still are aiming higher: "Our goal is to get to 90 percent recycling. A few years ago, 90 percent of our waste went to the landfill. So we're completely flipping our waste stream on its head."

A few items are still posing challenges for the Mariners in achieving their goal of a 90 percent recycling rate. "It's largely packaging and things that are in the wrong spot. The hard things we have now are the individual packets of condiments and the pre-packaged items—like a candy bar [wrapper] or a potato chip bag or a packet of ketchup or tartar sauce," Jenkins explains. "All that stuff is not easily recyclable or compostable for us, so it ends up as contamination in our compost stream. We're working with our vendors to figure out better packaging or better ways to serve the products to our guests that reduce packaging and convert what packaging we do need over to compostable."

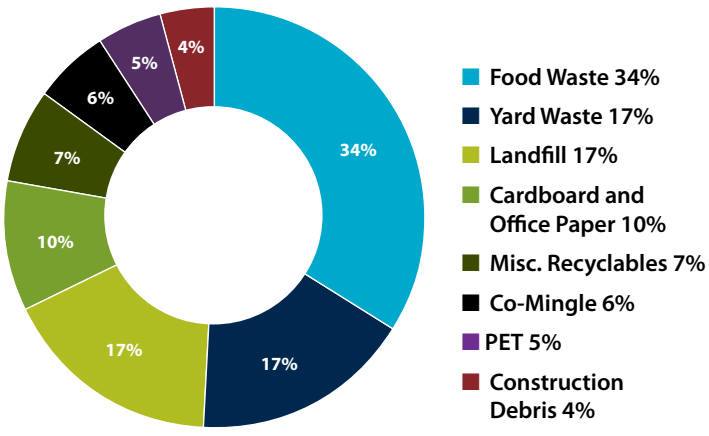
Jenkins is confident that sorting out these remaining items will get the Mariners to their recycling goal. "Now that we're down to a relatively small percentage of waste that's going to the landfill, we're starting to sort it because there is a good share of that waste that is just in the wrong place. And if we sort it and [remove] half of that stuff from the landfill-bound stream that's in the wrong place and recycle it, we'll jump from 81 percent to 90 percent."

Of course, making the switch to entirely compostable serviceware was not an easy feat, Jenkins explains. "But that's been a story where things are getting better. Initially with compostable products you didn't have a lot to choose from, and it was fairly expensive. You do have to be careful because you really can't spend more on these items, and the performance characteristics can be different—they are more susceptible to heat. But those things are getting much better now as people are starting to buy more of it. The marketplace has reacted; there are more suppliers, more types that you can buy, and the cost is coming down. There will be a point where it's financially irrelevant whether you buy petroleum-based products or compostable ones."

The Mariners have been working to engage their fans in their zero waste initiatives. One program, begun in 2012, is the BASF Kid Compost Trivia Game, which takes place during 10 Saturday home games of the season. "We basically ask an environmentally themed question at the end of the first inning and encourage fans to visit one of our 16 Zero Waste Stations for information about our zero waste initiative, where we have Camp Fire USA volunteers working to help fans recycle and encourage them to play the game," explains Jenkins. "At the end of the seventh inning, one lucky fan who has texted in the correct answer is awarded a Kindle Fire and an autographed baseball. It's a great program. On the first Sustainable Saturday, we gave away 10,000 kitchen compost catchers branded with Felix Hernandez so fans could collect organic waste at home and place it with their yard waste."

While the waste diversion program at Safeco Field has been a challenging, multiyear process, the financial savings have started to add up considerably: In 2011, the

Recycling and Waste Profile for the Mariners



Organics = 51% (Food Waste + Yard Waste)

"IT TURNED OUT WE WERE SPENDING MORE THAN $4,000 A DAY ON ENERGY AND WATER," says Jenkins. "I SAID, 'IMAGINE IF EVERY DAY YOU WENT HOME FROM WORK AND WENT TO YOUR MAILBOX AND THERE WAS A UTILITY BILL THAT SAID YOU OWE $4,000 TODAY. AND THEN TOMORROW YOU GO TO THE MAILBOX AND GET ANOTHER BILL THAT SAYS YOU OWE $4,000 TODAY.' ALL OF A SUDDEN THE INVISIBILITY OF THE COST OF THOSE THINGS BECAME APPARENT. THIS STUFF IS MONEY."

Mariners saved $95,000 in avoided landfill costs. While these savings are a direct result of the Mariner's 81 percent landfill diversion rate, part of the savings does have to do with the local infrastructure in Seattle, Jenkins admits. "In big-population areas it costs a lot to send things to a landfill. We're lucky it costs less to compost. So there's an economic incentive for us to divert from landfill to composting. When you look at the value of all the recycling streams we had last year, if we chose to landfill everything, we would have spent nearly $100,000 more."

LESSONS FROM THE FIELD

DATA COLLECTION DRIVES PERFORMANCE AND HELPS TARGET YOUR EFFORTS WHERE YOU WILL GET THE MOST BENEFIT: Keeping consistent data on your facility's consumption highlights areas for improvement and cost savings, and helps guide your environmental efforts accordingly. "You have to target your efforts on where you're going to get the benefit," says Jenkins. "By looking at our data, [we saw that] water, electricity, natural gas and recycling were all really obvious places to start." Tracking this data will also drive improved performance. "Data collection illuminates how you perform. You approach it completely differently the minute you start to measure and keep track of things and compare yourself to others. In our industry, it's all about statistics and where you are in the standings; that's the core mission of our business on the playing field. And that competitive nature and the desire to know where you are translates to the environmental side of things quite naturally."

GREENING IS AN ONGOING JOURNEY. START SMALL AND BUILD UP: "I would say the biggest obstacles are that you can't do it yourself, you can't force change—it has to evolve, and you have to have a base for it," says Jenkins. "So you've got to start small and count your wins, your little successes along the way, and celebrate those. It's a journey; it's not going to happen overnight. And you've really got to engage a lot of different stakeholders to make it work."

GET THE RIGHT PEOPLE INVOLVED FROM YOUR STAFF: Assembling a core green team of staff from different departments is key to getting environmental initiatives off the ground, according to Jenkins. "You've got to build that team of people to get things done, because everyone is so busy and distracted by what they normally do, and this is a whole other thing that you're layering on that traditionally these organizations have not done in their core business function. You're fighting for people's attention and organizational attention." Finding staff members who are passionate about this work is crucial to developing and sustaining the program. "One of the challenges we have is to get the right help involved because we can't dedicate staff members full-time for some of these things," Jenkins explains. "You start picking your dream team by who is it that you need to engage to accomplish that next objective—so the engineering staff, security staff, food service personnel and procurement staff are all key people to work with and play a huge role." Also, keep in mind that greening work may still be slowly making its way into job descriptions, Jenkins points out. "Everybody is already gainfully employed and working over 40 hours a week in their regular job, so people are doing things where they can within the scope of their normal work and adding a whole new component of sustainability to it from an operational standpoint, or a marketing or PR standpoint."

RECOGNIZE THE EFFORTS OF YOUR STAFF: "At the end of the day, you're engaging lots of people all over the ballpark in a common effort, and I think the real plus is the satisfaction they get from knowing they helped us succeed," says Jenkins. "It comes down to recognition. I think [recognizing staff] is very powerful, because they get that one-to-one pat on the back—'Hey, that's a great idea'—and they can feel good about what they do in the larger context of our improving our bottom line and reducing our environmental impact."

©Seattle Mariners

LOOK FOR OPPORTUNITIES TO PARTNER WITH LOCAL COMPANIES AND ORGANIZATIONS: Many sustainability initiatives require up-front investment, and partnering with local companies or organizations can be helpful in sharing some of these costs. "Fortunately in sports we have the ability to partner with other companies in the environmental space, and we're able to take advantage of these relationships," says Jenkins. "We've gotten help from Seattle Public Utilities, Seattle City Light and McKinstry [a mechanical contractor that specializes in energy projects], and we've invested money at times to do the engineering studies in order to find out what projects will give us the best payback. So there's been a bit of work involved, but we've gotten a lot of help from the outside and we've supported it financially to seed some of the engineering that needs to be done to figure out what those projects are."

BE PATIENT: Greening programs won't be successful overnight. "You have to be willing to try things that fail, learn from them and make adjustments," Jenkins advises. "When you're trying to change millions of people's behavior, it's very difficult to get the message out. You have to be very patient and measured in what you expect is going to happen, because it doesn't happen overnight. Again, I think that's where it pays to choose your opportunities carefully and start small. Get a little success, get a little wind in your sail. And when you've done that and learned from it and figured out a better way to do it, then look for the next opportunity."

SUSTAINABILITY IS A BUSINESS OPPORTUNITY: "It's an opportunity to reduce your costs, green your brand and reduce your environmental impact. Those are the three big reasons I think we should be doing this; why [the Mariners] are; and why we're getting support at the league level, the executive level, the ownership level, from the staff and from the fans," Jenkins remarks. "There seems to be a lot of momentum around sustainability, but I do also think the biggest selling point is the business case—because that's what's really going to drive this to take place with sports and venues. That's what businesses do. When you can prove the business case for it, you've made the initiative sustainable from a business standpoint. And we're at that point where everyone's realized this, and everyone's starting to do things in this space. "

CASE STUDY

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

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 1Earth 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 (CO_2)

Nitrous Oxides (NOx)

Sulfur Dioxide (SO_2)

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."

©STAPLES Center

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).

CASE STUDY

ROSE GARDEN ARENA, HOME OF THE PORTLAND TRAIL BLAZERS

FACILITY STATS

Location: Portland, Oregon

Began Construction: July 12, 1993

Opened: October 12, 1995

Seating Capacity: 19,980

Owner: Portland Arena Management

Operator: Portland Arena Management

Venue Uses: Professional basketball (NBA), hockey (WHL), concerts, family shows, conventions

Construction Cost: $400 million (in 2012 dollars)

LEED certification: Certified LEED Gold for Existing Buildings: Operations and Maintenance, in January 2010

THE TRAIL BLAZERS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

In the sports greening space, the Trail Blazers are true to their name as industry leaders in green building and making a business case for environmentally intelligent operations. In January 2010 the Rose Garden Arena became the first professional sports arena in the United States (and in the world) to achieve LEED Gold certification under the U.S. Green Building Council's Existing Buildings standard.

Three years later, the Blazers are still achieving incremental resource savings in energy, water and waste each year that continue to greatly benefit the team's bottom line. To date the Blazers have saved close to $500,000 in pure profit after recovering their up-front green investments in full.

WHY GO GREEN?

When it comes to environmental stewardship, the Blazers' fans don't just believe it's an important business consideration, they expect it to be there. Many companies in Portland recognize that they have a responsibility to reflect their community's passion for environmental protection in order to attract and maintain a strong clientele. The Blazers realized several years ago that their organization is no different.

The Rose Garden Arena embraced greening to become a community and market role model while also proving the business case of greening. "Being in what is recognized as one of the most sustainable cities on the planet, the Portland Trail Blazers are proud to play a role in Portland's environmental leadership," says Justin Zeulner, director of sustainability and planning for the team. "Ideally, we are playing a role to best represent the core values of our city and surrounding communities."

The Blazers see greening as way to give back to their community. For Zeulner, it comes down to one key question: How can the Trail Blazers make their community better? Through their greening work, the Blazers have found a way to marry community outreach programs with operational savings to create a sustainable program with multiple dividends.

WHERE TO START?

Like most teams, the Blazers started their greening work by getting buy-in and feedback from as many staff members and partners as possible. They created a "sustainability team" made up of interested people from all departments. "The vision to become the leader of sustainability in the sports and entertainment community was initiated using a team approach, not only involving our staff, vendors, partners and business affiliates, but also embracing the support of our fans," says Zeulner. "We feel our accomplishments and progress to fulfill our future goals are only achievable

"THE PORTLAND TRAIL BLAZERS ARE PROUD TO PLAY A ROLE IN PORTLAND'S ENVIRONMENTAL LEADERSHIP. IDEALLY, WE ARE PLAYING A ROLE TO BEST REPRESENT THE CORE VALUES OF OUR CITY AND SURROUNDING COMMUNITIES," says Justin Zeulner, director of sustainability and planning for the team.

using a team effort, which includes support from our staff, management, fans, visitors, suppliers, vendors, business partners and our community. Attempts have been made to connect with all of these stakeholder groups, soliciting feedback and suggestions."

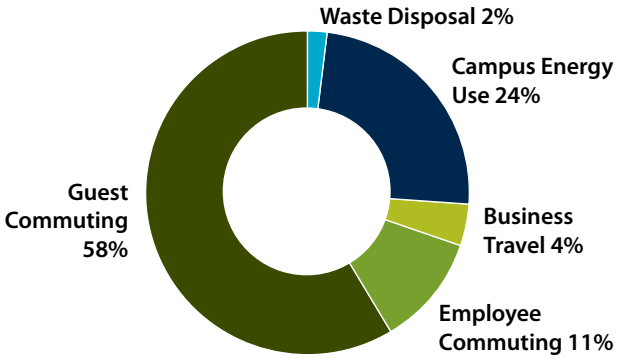
Next, the Blazers decided to hire an external consultant to guide their resource measurement, develop a plan for upgrades and implement greening improvements. "Recognizing that we have a role to play in these larger community objectives, such as enhancing our environmental impact, we started our programs by hiring a local, nationally recognized sustainability consultant, Green Building Services, to accurately measure our current carbon footprint and provide us with a road map toward making significant reductions to these impacts," explains Zeulner. "This involved an extensive Scope 3 analysis and development of several sustainable policies, procedures and programs."

Once the Blazers had mapped out their environmental impacts, they developed a "sustainability charter" to better frame the environmental mission statement that would guide their sustainability efforts. The charter is the Blazers' "driving document that serves as a sustainability road map," according to Zeulner. "The core charter developed to guide our sustainability initiatives, including the development of goals and strategies for each segment of our carbon footprint, was compiled by our sustainability team, a group of over 35 employees from all departments and levels of authority," he explains. "This group was tasked by our president and executives to develop a path that would lead us to become and remain the leader of sustainability within our industry."

Zeulner emphasized that top-level support greatly benefited the growth of the Blazers' green program. "Our sustainability efforts have included senior leadership support, to go along with unfettered dedication by our department leaders and front-line staff," he says. "Executives have paved the way with resources and vision, enabling environmental enhancement projects to be achieved."

Thanks to strong executive leadership on greening, Zeulner's sustainability team was able to quickly get green initiatives happening in departments throughout the Rose Garden's operations. "Food and beverage management has found creative ways to source local and organic foods and developed incentive programs to excite concession and kitchen staff to recycle and compost," Zeulner notes. "Operations teams have implemented purchasing strategies to ensure that we have eliminated toxic cleaning products from our facilities, that strict environmental policies are met regarding renovation and maintenance projects, and that we continue to strive toward zero waste. Guest Services find creative ways to help inform and encourage fans to recycle and compost while visiting the Rose Garden Arena. These are just a few examples."

Portland Trail Blazers Carbon Footprint



CHALLENGES: OVERCOME AND ONGOING

The Blazers decided early on that tracking was essential to their greening program. This decision led to two important investments: first, hiring the Green Building Services consulting team, and second, undertaking an extensive sustainability and carbon footprint analysis (see the above graph for the breakdown of the Blazers' carbon impacts).

Zeulner says that the time and money his team invested in the up-front measuring was quickly returned in resource savings as he was able to more easily identify the "low-hanging fruit." "These assessments and footprint analysis provided a road map for us to implement strategies toward maximizing our environmental performance," says Zeulner. "We started with easy wins that had paybacks of less than a few years, such as energy efficiency projects, implementation of advanced recycling and food waste composting operations, and implementation of environmental purchasing policies. These initial efforts have resulted in hundreds of thousands of dollars of operational savings, with payback met after just about a year."

By starting with the green projects with the greatest return on investment, the Blazers were able to gain momentum to pursue larger initiatives, like LEED certification. "While these projects and procedures were implemented, we made the decision to seek LEED certification for existing buildings through the U.S. Green Building Council," says

"WE STARTED WITH EASY WINS THAT HAD PAYBACKS OF LESS THAN A FEW YEARS, SUCH AS ENERGY EFFICIENCY PROJECTS, IMPLEMENTATION OF ADVANCED RECYCLING AND FOOD WASTE COMPOSTING OPERATIONS, AND IMPLEMENTATION OF ENVIRONMENTAL PURCHASING POLICIES," says Zeulner. **"THESE INITIAL EFFORTS HAVE RESULTED IN HUNDREDS OF THOUSANDS OF DOLLARS OF OPERATIONAL SAVINGS, WITH PAYBACK MET AFTER JUST ABOUT A YEAR."**

Zeulner. "Implementation of our sustainability initiatives, including LEED, included in-depth meetings with all facility departments, contracted service providers, vendors and suppliers (this includes waste haulers, contractors, etc.). During the meetings, we clearly set expectations, provided context and review of our environmental policies and programs, included training about these topics and developed metrics that would be tracked for all areas to ensure compliance."

The Blazers sought out additional outside guidance for their LEED process as well. These outside partnerships provided Zeulner's team with expertise on specific topics, such as onsite solar (NRDC) and carbon offsets (Bonneville Environmental Foundation). "Successful development of extensive sustainability programs requires partnerships with public and private enterprises. We sought out advice and leadership from organizations grounded in environmental values such as the NRDC, the U.S. Green Building Council, Cascadia, the Living Future Institute, the Bonneville Environmental Foundation and the EPA," says Zeulner. "These organizations provide unique perspectives pertaining to implementation of best practices and context to more complex issues, such as procurement policies. Our success in reducing environmental impacts would have been more challenging without the support of these partners."

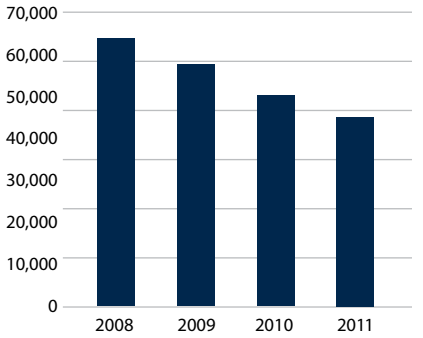
Financing efficiency upgrades and other green initiatives is a constant hurdle, but Zeulner points out that the up-front capital to fund environmental programs can come from a variety of sources. "In addition to internal capital resources, we applied for and received local and federal grant funding," he says. "Grants included financial resources to help implement energy-efficiency projects, recycling and food waste compost programs, installation of electric-vehicle charging stations and bike infrastructure endeavors. As of the end of the 2011 calendar year, we have saved close to $1 million while investing about $500,000, in less than three years."

The Blazers were awarded LEED Gold certification, the highest level of LEED certification awarded to any major sports venue to date, in January 2010. Despite this impressive accomplishment, the Blazers still push for ongoing savings across the board (see adjacent graphs of the Blazers' resource savings). Zeulner explains: "We were bestowed with Gold during the first part of 2010. This was a significant milestone for us, but we quickly continued to keep our momentum. We implemented further deep building retrofits; invested further in bike and electric-vehicle infrastructure; developed partnerships with local environmental nonprofits to advance their mission; invested in offsetting 100 percent of our energy, gas and water consumption impacts; joined Business for Innovative Climate & Energy Policy; and helped found the Green Sports Alliance to share best practices within our industry and further the impacts that leveraging professional sports can have on larger global initiatives."

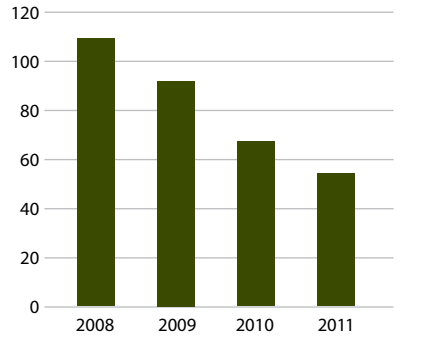
The Blazers have been able to use their greening work to strengthen their community presence and benefit the local economy by building for the future. "We are now assessing projects that go beyond the four walls of our arena and attempting to inspire growth toward development of Eco-Districts," says Zeulner. "This includes looking at things like district energy, shared water management systems, harvesting rainwater, developing gray-water reuse strategies, investing in district-scale food waste-to-energy systems, furthering renewable energy, reducing transportation-related impacts to our region and other projects related to maximizing environmental enhancements."

So far the Portland public has been very receptive to the Blazers' efforts and continue to support the team's expanding

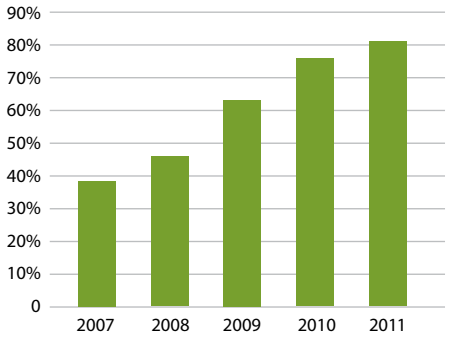
Electricity Savings Per Game-Day Event
kWh/Event Day



Water Savings Per Game-Day Event
CCF/Event Day



Waste Diversion Per Game-Day Event
Diversion Rate



"FUNDING ENVIRONMENTAL PROGRAMS CAN COME FROM VARIOUS SOURCES. IN ADDITION TO INTERNAL CAPITAL RESOURCES, WE APPLIED FOR AND RECEIVED LOCAL AND FEDERAL GRANT FUNDING," says Zeulner. **"AS OF THE END OF THE 2011 CALENDAR YEAR, WE HAVE SAVED CLOSE TO $1 MILLION WHILE INVESTING ABOUT $500,000, IN LESS THAN THREE YEARS."**

greening program. “Our efforts have only received positive feedback, including thousands of positive media articles, local achievement awards and immense fan applause,” observes Zeulner. “The operational savings alone have proved these efforts worthwhile, but beyond the business case, we have supported larger community goals, supported brand development, enhanced the fan experience and made significant connections.”

STANDOUT GREENING ACCOMPLISHMENTS

- ★ **Recycling:** More than 80 percent of operations waste is diverted from local landfills. Recycling stations for visitors and a food waste composting program with vendors divert about 1,000 tons annually. 100 percent of food waste is composted.
- ★ **Transportation:** More than 30 percent of Rose Garden attendees use public transportation or alternatives such as bicycle commuting. The team subsidizes transit passes for staff and uses bikes and electric vehicles for onsite operations. 43 percent of Rose Garden staff use alternative transportation.
- ★ **Energy, Gas and Water:** In addition to upgrading to energy efficient lighting and low-flow plumbing fixtures, the Trail Blazers partnered with Pacific Power and the Bonneville Environmental Foundation for the purchase of 100 percent renewable energy programs and Water Restoration Certificates for the Rose Garden. The Blazers cut water use by 17 percent.
- ★ **Purchasing:** The Trail Blazers developed partnerships with suppliers for sustainable purchasing, including more than 95 percent compostable food and beverage serving containers and materials, 100 percent recycled content trash liners, reusable commodities that replace disposables where feasible, green-certified chemicals and equipment, and sustainable food and beverage alternatives for fans.

“THE OPERATIONAL SAVINGS ALONE HAVE PROVED THESE EFFORTS WORTHWHILE, BUT BEYOND THE BUSINESS CASE, WE HAVE SUPPORTED LARGER COMMUNITY GOALS, SUPPORTED BRAND DEVELOPMENT, ENHANCED THE FAN EXPERIENCE AND MADE SIGNIFICANT CONNECTIONS,” says Zeulner.

LESSONS FROM THE FIELD

GREENING, INCLUDING LEED CERTIFICATION, CAN BE AN INVESTMENT THAT PAYS OFF: While the up-front investment in major greening upgrades is significant, the payoff is greater. The Blazers invested $560,000 in operations improvements around the Rose Garden. By 2011 the team had recouped $411,000 in energy savings, $165,000 in water savings and $260,000 in waste diversion savings, with a total savings of $836,000. “As of the end of the 2011 calendar year, we have saved close to $1 million while investing about $500,000, in less than three years,” says Zeulner. “We forecast that our savings will reach over $1 million by the end of 2012.”

DEVELOP AN ORGANIZATION-WIDE GREENING CHARTER TO GUIDE YOUR EFFORTS: Once the Blazers had executive buy-in and a sustainability team assembled, they developed a sustainability charter to better frame the environmental mission statement that would guide their sustainability efforts. “Establishing a charter, our driving document that serves as a sustainability road map, led to the U.S. Green Building Council assignment of LEED Gold certification for the Rose Garden arena in 2010, the first and only existing building in professional sports worldwide to achieve this designation,” says Zeulner. The charter included the Blazers’ sustainability mission statement, which helped the team plan out and prioritize their green initiatives.

SET PROGRESSIVE GOALS: Zeulner advocates setting progressive goals to spur your green program to higher levels. The Blazers set a goal of carbon neutrality, which requires that they offset more carbon than they produce at the Rose Garden (evaluated using a Scope 3 carbon assessment with the 2007–2008 base year). The Blazers aimed for the highest level of LEED certification to date and achieved it with the guidance of their outside consultants and partners. The Blazers also established a corporate sustainability initiative to incorporate environmental considerations into all internal decisions.

REMEMBER TO CONSIDER IMPROVEMENTS TO EMPLOYEE AND PATRON HEALTH VIA GREENING: Thanks to the LEED certification process, the Blazers significantly improved indoor environmental quality at the Rose Garden. They did this by implementing an internal air quality plan, banning smoking, ensuring all ventilation and filter systems met ASHRAE standards, promoting occupant comfort by providing lighting controls and thermal comfort, and using 54 percent green cleaning products and 73 percent green cleaning equipment to improve indoor air quality.

CASE STUDY

BELL CENTRE, HOME OF THE MONTREAL CANADIENS

ARENA STATS

Location: Montreal, Quebec

Began Construction: June 22, 1993

Opened: March 16, 1996

Seating Capacity: 21,273 (hockey), 22,114 (basketball)

Owner: Molson Family

Operator: Molson Family

Venue Uses: Ice hockey, basketball, lacrosse, as well as concerts

Construction Cost: $270 million (in 2012 dollars)

THE CANADIENS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Bell Centre is the only professional sports venue in North America to be awarded three independent environmental certifications: LEED Silver for Existing Buildings (EBOM), ISO 14001, and Quebec's ICI ON RECYCLE Level Three (the highest level). On October 13, 2009, the Canadiens became the first NHL team with a LEED-certified home arena and the first to achieve the LEED Silver level. A month later the Canadiens were also awarded the International Organization for Standardization's 14001 certification for implementing an environmental management system (EMS). Three years later, the Canadiens are still expanding their green work, including planned renewal of their LEED EBOM certification in 2014.

WHY GO GREEN?

For the Canadiens, greening started as a top-down initiative. "Our environmental program originated internally in 2007, ahead of the team's 100th anniversary in 2009, as a legacy element we'd be establishing for our current and future generations of fans. In recent years the Molson family has really embraced our objectives and supported our goals to become one of the leading arenas and sports clubs anywhere in the world in that regard," says Xavier Luydlin, director of building operations for the Canadiens. "It was important for them that we become an impressive and respected corporation regarding sustainability."

From the outset, the Canadiens worked hard to take a system-wide approach to greening while also setting their initiatives apart from those of other major sports venues. "The owners wanted to ensure that we put in place a system that shows the fans and Quebec that we really consider greening a strong priority for our company," says Luydlin. "They pushed really strongly for something that reflects our commitment to greening and sets the Bell Centre apart from all professional sports venues in North America."

The Canadiens' green campaign wasn't about saving money but about a corporate priority to be socially responsible, though Luydlin's team was able to achieve both. "The intention of the ownership was not to put in place a program to save money, but to be green," he explains. "If we could make money at the end of the process, that would be great. We asked first, 'What can we do to be green?' and then said, 'We'll see if we can save money.' Of course we are saving, as our electricity and mechanical systems are much more efficient, but our first goal was to be green."

"WE ASKED FIRST, 'WHAT CAN WE DO TO BE GREEN?' AND THEN SAID, 'WE'LL SEE IF WE CAN SAVE MONEY.' OF COURSE WE ARE SAVING, AS OUR ELECTRICITY AND MECHANICAL SYSTEMS ARE MUCH MORE EFFICIENT, BUT OUR FIRST GOAL WAS TO BE GREEN," says Xavier Luydlin, director of building operations for the Montreal Canadiens.

WHERE TO START?

Greening began at Bell Centre with an organization-wide environmental directive from the owners. "It was such a priority that it was incorporated as a factor for all of the annual staff objectives," says Luydlin. "It was important for some of the top management and the people directly involved in the process."

From the outset, the Canadiens hired a local consulting firm to help guide the environmental certification process and verify their results. "The key staff teams that work on greening are operations and marketing. From the beginning we also involved the SMI Group, a top-notch consulting firm in Canada," says Luydlin. "We hired them to make sure that an independent group could evaluate our process to make

sure that our numbers are accurate. As you know, in Montreal the Canadiens are similar [in reputation and following] to the Yankees in New York."

The first step for the Canadiens was measurement, with the help of their consultants. "The SMI Group helped us get a detailed picture of the Bell Centre operations with a full audit of our usage in 2008 in order to set our objectives for 2009," explains Luydlin. "Water, waste and energy audits were essential for our certifications. We started with the audits and then began benchmarking nine or ten major sport venues in Canada and the U.S."

During 2008 the Canadiens operations team spent several months collecting data around North America on resource use at other major sports venues and researching the greening efforts of their peers. "We looked at their best practices, but our objective was to make sure we were above the others," says Luydlin. "Our upper management's goal was to make sure that we did something different from our peers and developed a more holistic greening program."

On the basis of their industry research and greening directive, Luydlin's team decided to pursue the most well-regarded operations-based certifications available. "We realized that the best way to become a good example or a sports greening role model was to get three certifications," says Luydlin. "The two main certifications were LEED and ISO 14001. By following those certifications in particular, we realized we could bring the Bell Centre to a different level of sustainability."

From setting their goals to achieving all three certifications, the Canadiens made quick work of these leading environmental standards. "We aimed to do the certifications in a very short time frame. We did the whole process for all three certifications in about a year and a half. That was the intention of our upper management, and we think it was a major achievement," says Luydlin. "We wanted to put in place a certified greening program that would show all of Canada that we are an example of sustainability." Luydlin also emphasizes the importance of buy-in from leadership for success: "It is very important to have the top management really commit. If it's just a dream or a green statement just for the sake of having a statement, it's impossible to make a project at that scale possible."

The Canadiens pursued the certifications one by one, beginning with the local waste-based standard called ICI ON RECYCLE ("here we recycle"), which is a Quebec government program that recognizes companies with excellent waste diversion rates. "We started with ICI ON RECYCLE as we realized that we were not being very efficient with our compost and recycling. We also recognized that it was a major impact on the environment," explains Luydlin. "Because ICI ON RECYCLE requires us to recycle or compost 80 percent of all of our waste, and LEED asks only for 70 percent diversion of waste, we were juggling for many months about pursuing the local certification as well," he recalls. "In the beginning we thought that trying to get ICI would be crazy. But in the end, we were able to do it."

The Canadiens worked for more than half a year to increase their landfill diversion rate, first and foremost by making recycling more readily available. "Our initial approach was to install 945 new three-tier recycling and garbage bins around the building to make sure that people put the right waste in the right bins. Another important component for increasing our diversion was to install a Green Squad of nine staff members who were responsible for managing waste during events and tracking our waste flow," explains Luydlin. "We also have a sorting team of 10 people who open all of the garbage at the end of an event to make sure that the fans threw their products in the correct bin. It's a very time-consuming process, but we learned that it's the only way to get the 80 percent diversion rate that we needed for certification." Luydlin's team finally succeeded in diverting more than 80 percent of their waste, and the Bell Centre was awarded Level 3 ICI ON RECYCLE certification, the highest level, on May 28, 2009.

After receiving ICI certification, the Canadiens immediately began the process of getting the LEED EBOM certification, registering the Bell Centre in June 2009. "The next step was to look at the LEED certification for an existing building," says Luydlin. "The first thing we did was look at all of our processes to determine how we could maximize our main systems. Just by changing our schedules—turning off the lights every hour automatically or shutting down toilets and water, for example—we decreased our consumption dramatically. And we reduced water use by 20 percent just by installing low-flow fixtures."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ In 2009 the Bell Centre was 35 percent more efficient in energy savings than any other venue of the same type in North America.
- ★ 258 washrooms were changed to reduce water use, which led to a reduction of approximately 20 percent in overall water consumption.
- ★ The organization decreased greenhouse gas emissions (GHGs) by 28 percent by reducing natural gas consumption.
- ★ Environmentally conscious purchasing policies were introduced, and 80 percent of purchases now include products that are locally made and/or composed of reused or recycled materials.
- ★ The Canadiens eliminated all CFC gas emissions from team equipment.
- ★ A purchasing policy requires that the organization buy only environmentally friendly cleaning products.
- ★ All electrical products meet EnergyStar efficiency requirements.
- ★ Reserved and priority parking is provided for hybrid cars.

The Canadiens' centralized operating system was a crucial component in optimizing their operations efficiency. "To become LEED Silver-Certified we needed to have a system in place that controls electricity and water consumption," says Luydlin. "SMI Group went through all of our processes to make sure that we put in place the best practices. Now all of our operations in the Bell Centre are controlled from a central source, which really helps improve efficiency."

"It was pretty time-consuming, but all of the employees were involved in the process within a few weeks and were really committed to change," says Luydlin. He believes the Canadiens successfully engaged staff by integrating environmental objectives into the metrics for annual employee objectives. "The key to achieve that collaboration and strong involvement is to make sure there is financial incentive for the middle management." When environmental factors are integrated into a company's fiscal decisions, all staff departments will respond, and quickly, Luydlin emphasizes.

The Canadiens were awarded the LEED Silver certification on October 13, 2009, and just a month later received ISO 14001 certification (on November 16). Thanks to the improved centralized system and the many upgrades the Canadiens completed for LEED, Luydlin's team was able to quickly comply with the environmental management system (EMS) requirements of the ISO 14001 standard.

WASTE SUCCESSES TO DATE

To date, the Bell Centre's average recycling and composting rate exceeds 80 percent of materials discarded.

On an annual basis, this recycling rate represents:

- ★ 100 tons of bottles
- ★ 100 tons of reused beer casks
- ★ 2 tons of aluminum cans
- ★ 39 tons of food donations (approximately 25,000 meals)
- ★ 250 tons of other plastics, glass and metals
- ★ 106 tons of cardboard
- ★ 25 tons of wood
- ★ 6 tons of furniture
- ★ 235 tons of compostable materials

When added together, it represents more than 860 tons of materials recycled and composted annually.

CHALLENGES: OVERCOME AND ONGOING

Though the Canadiens took the time to investigate their peers' green projects, they found few system-wide greening models to follow back in 2008. "We realized that some of the buildings we looked at across North America during 2008 were choosing projects to get good publicity right away," says Luydlin. "When you are talking about sustainability, you need to have a holistic approach. Every practice needs to be directed toward sustainability. Some venues had good ideas and good programs, but each program was just in one direction, not a complete cycle of sustainability."

The Canadiens sought to fill that gap by implementing a comprehensive greening approach and by seeking multiple verifications through third-party certifications. "Our approach here at the Bell Centre is not to make greening changes for financial or aesthetic reasons, but to make our practices really green. We are convinced here in Montreal that we need to look at the life cycle of a product. That's why we realized that the best way to become green was to become LEED and ISO 14001 certified."

For the Canadiens, the business case for greening doesn't rely solely on direct cost savings from improved resource efficiency. The organization's green efforts have attracted many thousands of dollars in corporate funding, strengthening its sponsor relations, its green brand and its role in the Montreal community. "Though there are a few things that make our sustainability projects very costly up front, we are lucky in Montreal because we have many corporations that want to partner with us on greening, and most of our initiatives have been paid for by private companies," explains Luydlin. "The private sector wants to be involved in our green approach because it's a great marketing opportunity for them. It's a win-win situation."

Luydlin emphasizes that when it comes to outside funding, all of the Bell Center's green funds have come from the private sector. "We have no government involvement except for their verification of our waste diversion. Otherwise, it's all private. The government's approach is to put in place the law and then we have to take care of implementation," he says. "The government doesn't help us financially or in other ways to achieve that goal, but luckily we have private investors—such as our engineering firm, our waste management company, our eco-cleaning products company and our transit partner—who are all enthusiastic about helping us."

Luydlin's unique experience working toward triple certification allows him to compare the investment breakdown for each one. "In terms of cost and amount of equipment upgrades, LEED was the most challenging certification," he says. "To get recertification in 2014, we predict that we're going to have to invest about $100,000 as the USGBC has updated and increased its demands. It'll likely be difficult to find a partner to invest that much in the building, but at the same time it's a really great certification and we're committed."

While LEED is the most cost-intensive certification and ICI ON RECYCLE sets some of the highest standards, ISO 14001 requires the most ongoing compliance, Luydlin notes. "ICI ON RECYCLE was difficult because the 80 percent diversion rate was such a high level to reach. To achieve that you must have everybody on board, but financially it wasn't nearly as challenging as LEED," he says. "Pursuing ISO 14001 involved some work, but since it was at the end of our

process it was much easier than the other two certifications. The major factor for ISO 14001 is that every year we have an audit from ISO, which means that we need to be on top of our management practices. But the audits aren't difficult to complete, and though we need to pay for them, compared to LEED it's nothing."

LESSONS FROM THE FIELD

STUDY AND LEARN FROM YOUR PEERS' BEST PRACTICES: During 2008, the Canadiens' operations team spent several months collecting data around North America on resource use at other major sports venues and researching their peers' greening efforts. "We researched our peers' best practices to find out what was happening in the sports greening space to help inform our strategy…. Our ultimate objective was to make sure that we were above the standard," says Luydlin.

USE YOUR GREENING INITIATIVES TO ATTRACT SPONSORS: The Canadiens' green efforts have attracted many thousands of dollars in corporate funding, strengthening their sponsor relations, their green brand and their role in the Montreal community. "Though there are a few things that make our sustainability projects very costly up front, we are lucky in Montreal because we have many corporations that want to partner with us on greening, and most of our initiatives have been paid for by private companies," explains Luydlin. "The private sector wants to be involved in our green approach because it's a great marketing opportunity for them. It's a win-win situation."

CONSIDER THE ISO 14001 CERTIFICATION AS WELL AS LEED: Investigate ISO 14001 alongside LEED certifications, and consider any local certifications in your region. "Venues probably don't pursue ISO 14001 because they believe that it will limit their management and control of operations. Though it's demanding and rigorous, once you've implemented the process it's not too bad," says Luydlin. "It's not as difficult as LEED. ISO is much more about procedures and policies, so it is more feasible. For example, ISO doesn't require you to have a 70 percent diversion rate; it just demands that you respect and follow the greening goals that you set for yourself."

USE PLAYERS TO EDUCATE FANS ABOUT YOUR ENVIRONMENTAL PROJECTS: "We want people to be more environmentally conscious externally, not just our internal operations," says Angelo Ruffolo, coordinator of youth hockey. "We are creating a reforestation program. It will likely be called Break a Stick, Plant a Tree. Every time a player breaks a stick on the ice, we will plant a tree in the Montreal community. We also created a PSA with our players for Earth Hour," he continues. "These are a couple of the ways we're trying to get fans involved and more environmentally aware, particularly by involving our players, because to our fans, our greatest asset is our players."

INTEGRATE REWARDS FOR ACHIEVING ENVIRONMENTAL GOALS INTO STAFF COMPENSATION: Luydlin attributes the Canadiens' staff engagement success to integrating environmental objectives into the metrics for annual employee objectives and compensation. "The key to achieve collaboration and strong involvement is to make sure there is financial incentive for middle management. Greening was such a priority that it was incorporated as a factor for all of the annual staff objectives," he says.

"WE ARE LUCKY IN MONTREAL BECAUSE WE HAVE MANY CORPORATIONS THAT WANT TO PARTNER WITH US ON GREENING, AND MOST OF OUR INITIATIVES HAVE BEEN PAID FOR BY PRIVATE COMPANIES," says Luydlin.

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CASE STUDY

PROGRESSIVE FIELD, HOME OF THE CLEVELAND INDIANS

BALLPARK STATS

Location: Cleveland, Ohio

Began Construction: January 13, 1992

Opened: April 4, 1994

Seating Capacity: 43,429

Owner: Gateway Economic Development Corporation

Operator: Cleveland Indians

Venue Uses: MLB games, collegiate hockey games, the "Snow Days" attraction with ice rinks and tubing slides and concerts.

Construction Cost: $274 million (in 2012 dollars)

THE INDIANS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Cleveland Indians are among the sports industry vanguard in the installation of onsite renewable energy, among many other greening accomplishments. Their stadium, Progressive Field, was among the first major sports venues in North America to install onsite solar, during the summer of 2007, and the Indians were the first American League baseball team to do so. In 2012 Progressive Field also became the first Major League Baseball stadium to install a wind turbine.

While the Indians' greening work was kick-started by impressive cost savings from their expanded recycling program, it quickly spread to onsite renewables and environmentally preferable purchasing. The Indians also have several green projects on the horizon, with plans in the works for a 4,000-square-foot green roof and solar thermal technology.

WHY GO GREEN?

The Indians see their green work, and their onsite renewable investments in particular, as an opportunity to be a role model for their local community and for Cleveland businesses by investing in local clean-tech jobs. "With our turbine project we hope to not only benefit the environment by increasing our use of renewable energy, but also help promote an impressive new technology that generates local jobs by taking advantage of Cleveland's great manufacturing workforce and factories," explains Brad Mohr, assistant director of ballpark operations for the Indians.

With green projects like their wind turbine, the Indians hope to stimulate the local economy and help grow Ohio's clean-tech manufacturing industry. Mohr notes that apart from the blades, which were made in Michigan, each component of the turbine was manufactured in Ohio. "The real point is that our turbine was a Cleveland project. Close to our entire turbine was made in Ohio, and we need this kind of growth industry here," he says. "We have a huge skilled-labor force here in Cleveland that used to be employed by the steel industry and the auto industry. We have the labor and the infrastructure to build these turbines." The Indians' turbine was designed so that all the parts and labor needed to mass-produce the turbine system are available in northeast Ohio.

"THE CLEVELAND INDIANS ARE COMMITTED TO EXPLORING THE OPPORTUNITIES TO HELP PRESERVE THE ENVIRONMENT THROUGH THE USE OF ADVANCED ENERGY," says Jim Folk, vice president of ballpark operations. **"USING THE LATEST SUSTAINABLE TECHNOLOGIES IS NOT ONLY GOOD FOR THE COMMUNITY, BUT GOOD FOR BASEBALL."**

The Indians also see their highly visible onsite renewable projects, alongside their recycling programs, as another great way to connect with their fans and community. "The Cleveland Indians are committed to exploring the opportunities to help preserve the environment through the use of advanced energy," says Jim Folk, vice president of ballpark operations. "Using the latest sustainable technologies is not only good for the community, but good for baseball."

WHERE TO START?

The Indians' first major greening projects revolved around the team's interest in alternative energy. "We first looked at putting some vertical-axis wind turbines on the ballpark because we get a lot of turbulent wind in downtown Cleveland," say Mohr. "The technology wasn't there, so we decided to go with a solar pavilion, particularly as it

dovetailed nicely with the American Solar Energy Society's convention, which was held in Cleveland in 2007."

In June 2007 the Indians installed a 42-panel solar electric system—visible to the thousands of fans who pass through the ballpark each game day—that generates enough power to run all 400 televisions throughout Progressive Field with 8.4 kilowatts of clean renewable energy (approximately 10,000 kilowatt-hours per year).

The entire solar project cost $180,000, with the Indians investing $100,000, $50,000 provided by the Cleveland Foundation via Green Energy Ohio, and $30,000 from the Ohio Department of Development. "We got grants for our solar panels, which took $80,000 off the project cost," says Mohr, "though the Indians still contributed $100,000 and we realized it would entail about a 15- to 20-year payback. But the payback was not the point. Our solar project is an educational piece that demonstrates our commitment to clean energy."

That fan education piece is also incorporated into the Indians' recycling program. Since its inaugural year in 1994, Progressive Field has boasted recycling receptacles for plastic, cardboard and aluminum. However, it wasn't until late 2007, when the ballpark's waste hauling contract expired, that the Indians began to significantly expand their recycling facilities and establish the ballpark as an industry leader in waste management.

Towards the end of 2007, Mohr began researching smarter waste management systems for Progressive Field. The former waste contract required commingling of all recyclables—paper, cardboard, plastic, aluminum, scrap metal, electronics—which often resulted in the materials' becoming contaminated. These lower-value materials yielded no recycling rebate for the ballclub.

Mohr became determined to find a "better way to do this" and consulted with NRDC as well as a number of local recyclers. He established new partnerships with local waste companies and ultimately arranged for the separation of the ballpark's recyclables on site, instead of commingling. "This was the best solution for ensuring that we don't have contamination," says Mohr. "Now I know exactly what we're sending out and that it is in the proper state so that our partners can get the maximum rate for it."

CHALLENGES: OVERCOME AND ONGOING

The Indians were losing money by sending often-contaminated commingled recyclables to off-site sorting stations. So in early 2008 they decided to sort onsite by investing in two balers that create 1,200-pound cubes of cardboard and 500-pound ready-for-sale cubes of plastic or aluminum. Mohr points out that because the Indians are now doing the extra sorting onsite, the club gets a better price for the higher-quality source-separated commodities. In fact, it quickly became apparent that the financial payback for the recycling program would be swift. "Combining the money we saved from canceled trash hauls—paying to have waste picked up from the ballpark and sorted—with the money we made from selling the sorted recycled commodities, we paid off the total $30,000 cost of the two balers in six months," Mohr explains. "That really got people's attention and gave our environmental work real credibility. The senior staff's immediate response was 'Keep going!'"

In 2008 the Indians also launched a campaign called "Our Tribe Is Green… Are You in the Tribe?" to better engage staff and fans about the Indians' mission to reduce the ballpark's environmental impact. The campaign introduced 125 new Pepsi-sponsored plastic bottle recycling receptacles spread around the ballpark concourse. "Recycling is the main green activity we can offer the fans to participate in with confidence. If I put out composting, it would be contaminated in a minute," says Mohr. "In this part of the country, the lack of public education about diverting waste is a real challenge."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ In 2012, the Indians became the first Major League Baseball team to install a wind turbine atop their ballpark.
- ★ In 2007, the Indians became the first American League baseball team to install a solar system.
- ★ From 2007 to 2009, the Indians cut their trash in half from 1,262 tons to 613 tons. This reduced the number of trash compactor pickups—which cost an average of $500 each—by 64 percent, from 254 pickups in 2007 to 92 in 2010, saving $50,000.
- ★ All new Progressive Field signs use LED lighting, which offers energy cost savings, low-voltage operation and reduced carbon emissions.
- ★ Energy efficiency initiatives across the ballpark have cut the Indians' energy use from 23 million kilowatt-hours to 17 million kilowatt-hours annually and reduced the ballpark's carbon footprint by 42,000 pounds of CO_2 emissions yearly.
- ★ Green Seal–certified and 100 percent recycled content paper towels, toilet tissue, and facial tissue are used in the ballpark and front office.
- ★ 100 percent Green Seal–certified cleaning products are used throughout the ballpark.
- ★ As the second Major League Baseball ballpark to install onsite solar, Progressive Field generates enough electricity to power all 400 television sets around the ballpark.
- ★ More than 18,400 pounds of food was donated to the Cleveland Foodbank after home games during the 2009 season, which translates to 14,300-plus meals used to feed those in need.

FINANCIAL SAVINGS FROM SMART WASTE MANAGEMENT

- ★ In 2007 the Indians generated 1,261.6 tons of trash requiring 254 pickups at approximately $500 each.
- ★ By 2009 the Indians' improved recycling program had cut their trash back to 613.4 tons needing only 92 pickups.
- ★ The Indians have earned about $50,000 in pure profit every year moving forward (relative to 2007 costs), thanks to fewer trash hauls.
- ★ Since purchasing balers in early 2008, the club has earned more than $20,000 in commodity rebates for its recycled materials.

"THAT'S WHERE WE SEE THE FINANCIAL DIFFERENCE...IN RECYCLING, AND AVOIDING TRASH BEING HAULED AWAY," Mohr says. **"GREEN INITIATIVES ARE HERE TO STAY BECAUSE THEY SAVE TEAMS MONEY."**

The Indians improved ballpark recycling by implementing a ballpark "pick" after every game to sort compost and recyclables from trash. The Indians hire an average of 30 custodial staff to complete three sweeps of the entire ballpark, the first for compost, the second for recyclables, and the third for trash. In order to increase the recycling rate at the ballpark, Mohr now employs more custodial staff, hiring about eight additional workers to collect recyclables after each game, creating more local jobs while reducing the ballpark's environmental impact.

Mohr explains that the most effective way to implement front-of-house composting in Cleveland is with the ballpark pick. "It's almost preferable for fans to put their leftover waste underneath the seats so that after the game, our custodial crew can do three sweeps of the park and guarantee a clean waste stream, while sending the least amount out to the landfill as possible," explains Mohr. "But I don't encourage the fans to leave all waste under their seats because I don't want to give mixed messages about the importance of fans recycling themselves. We also want our fans and staff to stay safe and healthy, so we don't want to encourage unsanitary practices throughout the ballpark."

While encouraging fans to recycle more in the concourse, in 2009 the Indians also ratcheted up their recycling facilities in their home and visiting clubhouses, encouraging players as well as staff to recycle more. In 2010, composting bins (for food waste and grass clippings) were added to the clubhouses and across internal operations. The bins were quickly put to use, with a 96-gallon bin of food waste filled every two days during the season. "We get most of our compost from our restaurants, including some post-plate collection, aka leftovers from guests' plates at restaurants," says Mohr. "We get a surprising amount of compost from the clubhouses as well."

In three years the Indians cut their annual waste generation in half. In 2007 the ballpark generated 1,261.6 tons of trash; by 2010 this was down to 613.4 tons. This reduced the number of trash compactor pickups, which cost an average of $500 each, by 64 percent, from 254 pickups in 2007 to 92 in 2010, saving the club $50,000. Mohr is confident that the Indians will continue to save $50,000 or more annually, relative to 2007 costs, with the ballpark's improved waste management and recycling system. "That's where we see the financial difference…in recycling, and avoiding trash being hauled away," Mohr says. "Green initiatives are here to stay because they save teams money."

The ballpark recycled more than 150 tons of materials in 2009 and in excess of 125 tons in 2010, including cardboard, paper, aluminum, PET plastic, scrap metal, cooking oil, fluorescent bulbs and ballast, batteries and electronics. The year 2009 was a record recycling year, because that year the ballpark recycled all of the scrap metal from retired portable concession stands. Since installing balers in early 2008, the club has earned $20,000 in commodity rebates for its recycled materials.

"The Indians have a wide breadth of activity and efforts in greening and sustainability thanks to the guidance and support of NRDC and NRDC's unparalleled sports greening resources," says Mohr. "Our comprehensive recycling program is just the beginning, as we're also the first Major League club to install wind power. And we are trying to add a new green feature each year."

In 2008 the Indians partnered with Cleveland State University to pilot a pioneering helical wind turbine design, at no cost to the club, in the hope that it would help teach fans about the potential of renewable energy. The project was also designed to help boost renewable job opportunities in the region by providing a successful real-world test of a locally manufactured technology.

Dr. Majid Rashidi, a professor of mechanical engineering at Cleveland State University's Fenn College of Engineering, developed the innovative design using grants from the U.S. Department of Energy and the State of Ohio. The grants also fully covered the cost of the turbine and installation at Progressive Field. "It was cost savvy for us because it's a Department of Energy project," explains Mohr, "though it was still a little difficult to convince senior staff and the general council to invest time in a pilot technology. We were successful thanks to our organization's mission to act as a community role model."

After three years of work—planning, designing and building the innovative, corkscrew-shaped turbine—the Indians secured the apparatus on top of the southeast corner of Progressive Field on March 28, 2012. The 1,800-pound turbine was strategically assembled in the players' parking lot

at Progressive Field to cut down on transportation emissions and costs. Ironworkers affixed 80 translucent white plastic pieces around a heavy aluminum frame to form the thick corkscrew helix. The 18-foot wide cylinder now constantly rotates atop the ballpark to find the strongest wind to keep the four 6-foot circular turbines spinning, and generating energy, as fast as possible.

With the turbine installed and lit from within by colored LED lights, the Indians look next to engaging fans with interactive digital kiosks about wind energy. "It's a great opportunity to teach fans about the importance of clean energy technologies," says Mohr.

Thanks to a combination of energy efficiency and renewable energy projects, the Indians have cut their energy use by more than 20 percent. "We've shaved about 4 million kilowatt-hours a year off our average energy consumption, but that hasn't given us any cash savings," says Mohr, "as electricity was deregulated in Ohio on January 1 in 2009 and our electric rates went up 20 percent." However, with their green initiatives well under way by 2009, the Indians were able to avoid paying significantly more for their electricity by cutting their use.

LESSONS FROM THE FIELD

ANYONE CAN CHAMPION GREENING AND START A GREEN PROGRAM: When Mohr expressed interest in expanding the Indians' recycling program and applying for green grants back in 2005, he quickly was put in charge of the team's green program. "I turned into our greening and sustainability person even though I had no background knowledge and just believe recycling is important," says Mohr. "After our solar and recycling successes I was given the freedom, tools and trust to find additional green projects that we could do here at the ballpark." Mohr explains that any staff member can spark an organization's interest in greening by brainstorming with other staff, getting like-minded colleagues on board, identifying smaller-scale achievable projects and building a green program from there.

ENVIRONMENTAL BENEFITS FROM SMART WASTE MANAGEMENT

The environmental benefits of the Indian's efforts are also significant. Recycling just one ton of paper to avoid the production of paper from virgin materials saves enough energy to power an average home for six months, saves 7,000 gallons of water, and keeps 60 pounds of pollutants out of the air. Although it varies by grade and technology, making paper from recycled paper instead of from trees involves 64 percent less energy and 58 percent less water. Recycling one aluminum can saves enough energy to run a 25-watt compact fluorescent for nearly 16 hours (or a 100-watt incandescent light bulb for nearly four hours).

LOOK FOR LOCAL, REGIONAL AND FEDERAL FUNDING OPPORTUNITIES AND PARTNERSHIPS: "The entire solar project cost about $180,000. We got a $50,000 grant from the Cleveland Foundation, a local philanthropic organization, via Green Energy Ohio, which is a great nonprofit in the state that we work with very closely," says Mohr. "Combine that with $30,000 from the Ohio Department of Development, and there's $80,000 off the project."

INTEGRATE GREEN PRINCIPLES INTO YOUR PRACTICES WHEN ESTABLISHING OR RENEWING CONTRACTS: The Indians were able to save tens of thousands of dollars by reevaluating their waste processes when their garbage hauling contract was up. By talking with other local recyclers, Mohr's team was able to learn about more efficient and profitable practices. "Because we were no longer bound by our contract, I was able to pick the brains of and get proposals from a number of local recyclers," explains Mohr.

INVOLVE FANS IN YOUR GREEN PLANNING (AND THEY'LL BE PROUDER OF THE RESULTS): "The general fan response to our green projects is positive, especially when we talk about the payback, such as how we've cut our trash going to landfill by 50 percent compared with 2007 and how much money we've saved on trash hauls," says Mohr. "The best part is that when I give examples of our savings people say, 'What can I do to help?' or 'I have another idea.' It really starts a conversation, and I can always learn new things. I will listen to anybody's idea, no matter how weird it is. I think everybody has something to contribute, and I'll listen."

ENCOURAGE STAFF TO MAKE GREENING PART OF THEIR LIFE: A regular class for staff can help recruit new interest in your green program, keep staff up to date on your organization's accomplishments, spread your green message to a broader audience and help shift your community toward more environmentally preferable practices. "I hold a class each year about what we're doing to be greener at the ballpark. I want to encourage staff members to take it home, take it beyond downtown Cleveland," says Mohr.

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CASE STUDY

CENTURYLINK FIELD, HOME OF THE SEATTLE SEAHAWKS AND SOUNDERS FC

CENTURYLINK FIELD™

VENUE STATS

Location: Seattle, Washington

Opened: July 29, 2002

Seating Capacity: 67,000

Owner: Washington State Public Stadium Authority

Operator: First & Goal Inc. (FGI)

Venue Uses: NFL games; MLS games; NCAA football and international soccer games; Supercross and a variety of community events

Construction Cost: $430 million ($566 in 2012 dollars)

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

Thanks to the widespread public and professional interest in sustainability in the Northwest, environmental stewardship was built into CenturyLink Field even before the first U.S. sports greening programs were established. Back in 2000, 35 percent of the concrete from the Kingdome was recycled onsite to construct Seahawks Stadium (which has since been renamed "CenturyLink Field").

To this day, CenturyLink Field, the Seattle Seahawks and Seattle Sounders FC are leaders in professional sports greening, as founding members of the Green Sports Alliance, and business leaders in sustainability, with an onsite solar array, an aggressive recycling program and a strong environmentally preferable purchasing program.

WHY GO GREEN?

For Seattle-based First & Goal Inc. (FGI), operator of CenturyLink Field and CenturyLink Field Event Center, greening is about responding to the interests of their clients, which are the Seahawks and Sounders FC fans. Darryl Benge, assistant general manager at FGI and founding board member of the Green Sports Alliance, explains that it's especially important to respond to the environmental interests of the fan base.

WHERE TO START?

"Our greening started with the building of the facility and recycling the concrete from the Kingdome in order to use as much as we could to build the new stadium," says Benge. FGI was formed by Paul G. Allen in 1997 after Washington State voters approved the proposal to build a new football/soccer stadium and exhibition center, now called CenturyLink Field and Event Center. The Kingdome was demolished in 2000 to make way for the new stadium; 97 percent of the concrete was recycled locally, with 35 percent of it reused in the new facility.

"During 2005–2006 many venues and professional teams began the discussion on recycling and composting," notes Benge. In 2005 the Seahawks also partnered with Seattle City Light and Western Washington University to recognize local commitments to renewable energy with a Power Players award. "It was an opportunity to highlight and learn from different smart energy programs," Benge says.

In 2006 FGI launched CenturyLink Field's recycling program with the installation of 75 new recycling bins around the venue, fan and staff recycling education, and a new dedicated Recycling Sorting Area created to track and separate 17 different recyclable materials. "It grew in 2006, when FGI staff began to actively track recycling by materials, including plastics, metals, paper and cardboard," Benge relates. That year CenturyLink Field was also selected to participate in a study through the EPA WasteWise Partnership program.

"That was also the time of the development of the Green Team," says Benge. FGI's Green Team was made up of FGI and Seahawks staff, vendors and contractors who sought to

"OUR RECYCLING EFFORTS AND NEWLY FOUNDED GREEN TEAM WERE THE TWO BIGGEST KEY FACTORS TO SPRINGBOARD OUR ORGANIZATION'S THINKING ON OPPORTUNITIES IN SUSTAINABILITY," says Darryl Benge, assistant general manager at First & Goal Inc., operator of CenturyLink Field.

develop long-term policies and initiatives to reduce energy and resource consumption. "From there we really looked at what we were doing and how to document our practices so that we could analyze our data and hopefully improve it."

The Green Team met on a quarterly basis to discuss greening initiatives, with representatives from all FGI departments, the Seahawks (the Sounders FC didn't begin to play until 2009) and key partners like ARAMARK and Levy Restaurants. "We didn't ask corporate partners or representatives from the city to join our team," says Benge. "It was an internal yet holistic group, as we wanted our partners to also be invested and pass our green mission back to their organizations. This made it more successful."

According to Benge, FGI's diverse Green Team was crucial for growing the organization's green program. "Our Green Team would discuss how we could be better stewards of the environment as well as improve our business. This helped establish greening as a core belief from the organization," he explains.

Benge stresses that FGI's program involved a systematic and thoughtful evaluation of current processes. The Green Team started with waste. "Those early Green Team discussions involved the operational staff looking at all of the material going to the landfill and working with our vendors to (1) find a better and more sustainable process and (2) see if there was a business case to divert the waste from landfill to recycling," he says. A subgroup of the Green Team—made up of an FGI operations representative, a general manager from ARAMARK and FGI's loading dock manager—quickly formed to tackle waste-stream tracking and make improvements. "That core group of three would look at the invoices from the haulers, track the tonnage of different materials and create a spreadsheet," says Benge. "Once they had the data they could analyze and adjust the current processes to collect more recyclable material."

TIMELINE OF CENTURYLINK FIELD'S STANDOUT GREENING ACCOMPLISHMENTS

- ★ **2000:** 97 percent of Kingdome concrete was recycled and 35 percent was used at Seahawks Stadium.
- ★ **2006:** FGI staff began to actively track recycling by material, establishing a Recycling Sorting Area in order to measure and separate 17 different recyclable materials. FGI also created a Green Team to develop long-term policies and initiatives to reduce energy and resource consumption.
- ★ **2007:** FGI invested in new composting equipment and a cardboard baler, increasing cardboard recycling by 16 percent. FGI also launched a composting program and added 200 new recycling bins.
- ★ **2010:** It also installed additional point-of-use lighting controls in concession stands, restrooms and storage spaces and became certified as an EnergyStar Portfolio Manager partner.

  The Seahawks, Sounders FC and FGI joined with MLB, NFL, NHL, NBA and WNBA teams in the Pacific Northwest to help found the Green Sports Alliance.
- ★ **2011:** FGI committed to using nontoxic cleaning supplies, and 84 percent of cleaning and soap products were Green Seal-certified. FGI purchased only post-consumer paper products for toilet paper, hand towels and office paper and also purchased 100 percent recycled plastic trash liners. The amount of waste that was recycled rose to 70 percent (from 58 percent in 2010 and 47 percent in 2009).

  FGI donated 5,083 pounds of unused prepared food to Food Lifeline and 5,975 pounds to Operation Sack Lunch, helping to provide 4,596 meals overall.

  Seattle Sounders FC received the Green Globe Award for using reclaimed water for field irrigation at the Starfire training facility.
- ★ **2012:** In March, FGI implemented a single-stream recycling strategy with Allied Waste, to further their goal of achieving an 80 percent landfill diversion rate.

CHALLENGES: OVERCOME AND ONGOING

To ramp up their waste diversion rates, in 2007 FGI invested in 200 additional recycling bins (with the help of a subsidy from Anheuser-Busch), new composting equipment and a cardboard baler. The onsite baler immediately enabled the facility to increase cardboard recycling by 16 percent by minimizing material contamination. FGI later switched from fountain drinks to beverages in recyclable bottles, in partnership with Jones Soda, and launched a composting program. The Seahawks also announced a partnership with Levy Restaurants and Food Lifeline to recover all unused prepared food and donate it to local shelters following all Seahawks home games.

"We went from a 3 percent diversion rate in 2006 to receiving the Event Recycler of the Year award from the Washington State Recycling Association in 2009," says Benge. "That was because we went from recycling 3 percent to more than 47 percent—460 tons—of all our waste in under three years by working with ARAMARK, our housekeeping vendor, Levy Restaurants, our food and beverage partner, Cedar Grove Organics, our local composter, and Allied Waste, our waste vendor. We just reached out to our partners and said, 'Here's what we want to do,' and they helped us succeed."

FGI grew the composting program incrementally. "We started out in the kitchens, then worked on moving into the concession stands, and then into the concourse," says Benge. "We started out small to really make sure it worked before taking it to the next level." He points out that integrating composting throughout the concourse had its challenges. "Moving composting to concessions is difficult because they

Photo courtesy of Seattle Seahawks

are run by all different people, including volunteers and not-for-profits that have constantly changing staff." He recommends extensive signage and training tools to help get transient staff on board.

"Then in 2010 we took the next step and moved to all-compostable serviceware. We gave the fans only two disposal options: either recyclable (plastic, aluminum) or compostable. That system worked really well," says Benge. "We found that if you give fans the option of landfill bins, they usually choose landfill because it's familiar, even when the signs say compost." That year FGI installed more than 175 compost bins and another 200 recycling bins throughout the facility. By the end of 2010, the composting program, which was motivated by a city mandate, helped FGI reach a 58 percent diversion rate from landfills, totaling more than 525 tons of waste.

FGI has also been gradually improving the resource efficiency of CenturyLink Field over the past few years. FGI first hired Seattle-based McKinstry, a firm specializing in energy solutions, in 2008 to conduct a facility-wide energy audit and offer recommendations to further reduce energy and water use. "The results from that 2008 audit provided the springboard for the energy and solar initiatives we took during 2011," Benge says.

The teams managed the up-front financial investment and implemented the energy upgrades with help from rebates provided by Seattle's two main utilities, Seattle City Light and Seattle Public Utilities. "The energy and resource projects have a very good return on investment by themselves," says Benge. "Seattle City Light covered half of the fee associated with the McKinstry study, and the cost savings from the upgrades would help address that expense." Based on the audit, FGI worked with McKinstry to cut resource use throughout the complex by installing mechanical system upgrades, high-efficiency lighting and ultra-low-flow water fixtures, all of which support the facility's commitment to sustainability.

As FGI planned its energy upgrades, the company saw an opportunity to pursue an onsite renewable project. "Solar in the Northwest isn't the most convincing investment because our energy rates are really low and we don't get sun like Arizona or Southern California. So we decided to package solar with energy efficiency," explains Benge. FGI also relied on a guide produced by NRDC and BEF called "Solar Electric Energy for Your Stadium or Arena" to evaluate financing options. "NRDC's solar guide really assisted us because it did a lot of the work putting together information on the different renewables rebate programs and resources for us," says Benge. "It was a very helpful tool."

In May 2011, the Seahawks, FGI and Sounders FC announced the installation of a solar array on the roof of the CenturyLink Field Event Center. The solar installation covers 2.5 acres, spreading across 80 percent of the Event Center roof. The project consists of 3,750 thin-film solar panels, which generate more than 830,000 kilowatt-hours of electricity annually, enough to power 95 Seattle-area homes for a year.

The combined energy projects resulted in a 21 percent reduction in annual utility costs. This new clean energy source, alongside the new energy conservation measures, reduced the facility's carbon footprint by about 1,350 metric tons of carbon emissions per year. The facility is also equipped with a "cool roof" that conserves energy by reducing heat absorption, thereby lowering building cooling costs. CenturyLink Field also partnered with Seattle's electrical union to provide training opportunities and clean-energy jobs for local tradespeople.

"THE ENERGY AND RESOURCE PROJECTS HAVE A VERY GOOD RETURN ON INVESTMENT BY THEMSELVES, BUT THEY REQUIRE UP-FRONT CAPITAL, WHICH IS A BATTLE, ESPECIALLY WHEN YOU'RE IN A BUILDING THAT ISN'T THAT OLD," says Benge. **"SEATTLE CITY LIGHT PICKED UP HALF OF THE FEE ASSOCIATED WITH THE MCKINSTRY STUDY, AND THE COST SAVINGS FROM THE UPGRADES WOULD HELP ADDRESS THAT EXPENSE."**

LESSONS FROM THE FIELD

USE THE NRDC/BEF SOLAR GUIDE FOR STADIUMS AND ARENAS: FGI used NRDC's and BEF's solar guide to instruct their planning process and get the project off the ground. "The solar guide provided by the NRDC and BEF was instrumental in helping us develop our request for proposal and the evaluation of each contractor's submission," says Benge. "Without this resource, we wouldn't have been able to be as comprehensive in our approach. This tool made the process much easier for all parties involved."

LEARN FROM THE GREEN SPORTS ALLIANCE TO MINIMIZE INVESTMENT RISK: "Dialogue with peers who have already looked into greening initiatives and/or have even been successful can be very helpful to challenge or validate plans," suggests Benge. He recommends the Green Sports Alliance for learning from peers and sharing better practices. "Large venues typically haven't talked across venues because of the competition in the sporting world. However, the Green Sports Alliance has provided a very important mechanism for collaboration because members have a common goal and interest."

USE ONLINE TOOLS TO ENGAGE FANS: "We plan to build an interactive website that allows the fans to engage and let them know what we're doing and what they can do at home," Benge says. His team is building on its existing online promotions. In 2008, the Seahawks partnered with Puget Sound Energy (PSE) and Seattle City Light to develop a Blue Is Green educational program featuring interactive green tips for fans on the team's website.

CREATE A GREEN BRAND TO ENHANCE FAN ENGAGEMENT: "In terms of new initiatives," Benge notes, "we just went through the process of developing our brand around sustainability, and it's called Defend Your Turf. We're working with our PR departments, marketing departments and corporate partners departments to roll that out in the next six to eight months. We want to make it visible to fans as well as individual partners who may want to align with that message."

In 2010 the Seattle Seahawks/Sounders FC launched a fan education campaign on compost and recycling programs that encourages fans to leave beverage cups, food trays, napkins and unconsumed food in the seating area so staff can collect and sort items and minimize contamination for the compost program. "Our strategy for education was about good signage on the waste and compost bins, and we also worked with our promotions department to make sure we had good PSAs that were featured on the video boards during games about what bins to use. They built these small PSA commercials to loop through the content. We're fortunate that 80 to 90 percent of our fan base is season ticket holders. So they learn once and remember at future games."

USE LEAGUE-BASED CONTACTS TO OVERCOME REGIONAL INFRASTRUCTURE CHALLENGES: "Every region and venue is different but they all share similar features. Sometimes the solutions for one facility translate to others, although sometimes they don't translate so well. The Kansas City Chiefs, for example, wanted to start a composting program but discovered they do not have a local composting company. It really depends on the organization, the building and the region," says Benge.

CENTURYLINK FIELD'S SUSTAINABLE FOOD PROGRAM

In 2010 FGI worked with Levy Restaurants to implement a sustainable food program, with four suppliers showcasing local and organic products from around the region. The suppliers were:

- ★ **Charlie's Produce**, which features certified organic growers from Washington and Oregon
- ★ **Niman Ranch**, a network of 600 sustainable U.S. farmers and ranchers who raise livestock traditionally and humanely
- ★ **Uli's Famous Sausage of Pike Place Market**
- ★ **Beecher's Cheese of Pike Place Market and Farm to Fork**

FGI also follows the guidance of the **Monterey Bay Aquarium** by hand-picking seafood products that are not currently listed on the endangered species list, according to their guide.

CASE STUDY

TARGET FIELD, HOME OF THE MINNESOTA TWINS

BALLPARK STATS

Location: Minneapolis, Minnesota

Began Construction: August 30, 2007

Opened: April 12, 2010

Seating Capacity: 39,504

Owner: Minnesota Ballpark Authority

Operator: Minnesota Twins

Venue Uses: MLB games, collegiate baseball games, concerts

Construction Cost: $581 million (in 2012 dollars)

LEED Certifications: LEED Silver for New Construction in April 2010, LEED Silver for Existing Buildings: Operations and Maintenance in December 2011

THE TWINS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

When Target Field received its LEED Silver New Construction (NC) certification shortly after opening in 2010—at the time, it was only the second ballpark in the U.S. to receive LEED certification—the U.S. Green Building Council called it the "Greenest Ballpark in America." But the Twins didn't stop there: The stadium went on to earn LEED Silver for Existing Buildings: Operations & Maintenance (EBOM) the following year.

WHY GO GREEN?

Pursuing LEED certification was built into the stadium's construction requirements, thanks to a provision in the State of Minnesota's 2006 ballpark legislation.[1] In addition to the state requirements, "our owners from the very beginning felt that this facility and this organization needed to be on the leading edge of sustainable operations," explains Dave Horsman, senior director of ballpark operations. "That was part of the design principle going into the facility. That's where we started from with the architects and the general contractors."

"Gaining LEED certification has been a long-standing goal for the Twins, Hennepin County and the Minnesota Ballpark Authority as we have collectively shared the responsibility to ensure strong environmental stewardship," said Twins owner and CEO Jim Pohlad when the club earned its first LEED certification. "It's our sincere hope that the sustainability aspects of Target Field will provide inspiration to other local, regional and national projects of this magnitude."[2]

WHERE TO START?

"Our greening program started with LEED certification. When our executives and our owners sat down with the architects to design the building, there were some key principles they were looking at. They wanted to make a ballpark that was uniquely Minnesotan—architecture that fit in with downtown Minneapolis. They also wanted to design a building that was beautiful architecturally but also functional. And the other piece was environmental stewardship," says Horsman.

With sustainability in mind from day one, it was easier to integrate greening into every phase of the process, says Horsman. "We had a consultant, a general contractor and an architect. As we got more and more involved, there was an environmental component to every meeting and discussion. It became commonplace and ingrained with everything else."

"One of the key things is that our ownership involved the front-office staff, specifically the operations staff," he continues. "They got a lot of us into the process. If we had good ideas and good judgment, they were fully supportive. The philosophy that we came to is that a LEED certification

MINNESOTA TWINS SUSTAINABILITY STATEMENT

"The Minnesota Twins organization believes our future success—both on and off the field—is built on a business model that embraces operational efficiency, environmental stewardship and social responsibility. We honor the power of sport by leading through example, and we will continue to use sport to inspire, build the best fan experience and cause no unnecessary harm, working with our fans, community, suppliers, partners and employees to have a positive influence in the world."
—Minnesota Twins website

"IT'S OUR SINCERE HOPE THAT THE SUSTAINABILITY ASPECTS OF TARGET FIELD WILL PROVIDE INSPIRATION TO OTHER LOCAL, REGIONAL AND NATIONAL PROJECTS OF THIS MAGNITUDE," said Twins owner and CEO Jim Pohlad.

would be nice but in reality, certification or not, we wanted to build and operate a facility that is as sustainable as possible. In other words, we didn't really want to engage in any window-dressing. We wanted the initiatives to be substantive and to help us with sustainability as well as our operations."

Since the stadium was a new construction, there were many opportunities to reduce environmental impacts when it came to choosing a site, building materials and construction practices. The stadium was sited in downtown Minneapolis, easily accessible by walking or biking and near several public transportation options, including rail and bus routes. The site itself was a previously contaminated brownfield that required soil remediation. The Twins also took advantage of regional resources while also tying in to the local aesthetic. "Wanting to be uniquely Minnesotan helped in sourcing local materials," says Horsman. "We have 100,000 square feet of limestone on the exterior of our building that was quarried 90 miles away. Because we wanted something reminiscent of Minnesota, it was easy to find opportunities to source local materials."

Another significant feature of the stadium's site was an existing underground cistern system that could be refurbished to control runoff and capture rainwater for reuse onsite. The rainwater capture system now in place at the stadium is one of its standout features and a key part of the LEED project. "Our rainwater capture system was part of the construction process," explains John McEvoy, manager of ballpark operations. "The initial intent of our cistern was to let the sediment settle to the bottom before the water is pushed back into Bassett Creek, which runs near our ballpark. Later in the process, Pentair came to us with the idea of us reusing the water."

"In a 'city of lakes,' the Minneapolis tagline, we try to be conscious about our water," McEvoy adds. "We have a partnership with a local company that has helped us put in a rainwater recycling system. We are able to use that rainwater to wash our lower concourse."

Through a custom-designed rainwater recycle system provided by Minneapolis-based Pentair, the Minnesota Twins captured, purified and reused more than 686,360 gallons of rainwater in 2011, reducing the use of municipal water at Target Field. "It essentially collects rainwater that gets filtered out and put into a 5,000-gallon holding tank," McEvoy continues. "The cistern itself is 200,000 gallons. When we pressure-wash at the end of the night, that cistern is full enough to use the rainwater to wash the seating area. We save 14,000 to 21,000 gallons of water and 86 gallons of gasoline, as well as 57 man-hours of labor, per game when we use that system." In the future, the Twins plan to refine the purification system and hope to use the recycled water to maintain the playing field.

GREEN CONSTRUCTION INITIATIVES

- ★ Site required brownfield remediation; soil had to be treated and site decontaminated.
- ★ 60 percent of the building's exterior is regionally sourced limestone from Mankato, Minnesota (90 miles from the ballpark).
- ★ More than 70 percent of construction waste was recycled or otherwise diverted from landfill.
- ★ More than 30 percent of all installed materials were made from recycled content, including the foul poles and roof canopy.
- ★ Precautions were taken to control soil erosion, waterway sedimentation and airborne dust.
- ★ Stadium was sited to include a public transportation hub where commuter and light-rail lines terminate, adjacent to a major bus hub as well as easily accessible by bike riders and pedestrians.

CHALLENGES: OVERCOME AND ONGOING

Among the biggest challenges at the stadium was reducing energy consumption, particularly for the LEED Existing Buildings: Operations & Maintenance certification. "We were concerned that we wouldn't make that energy prerequisite, which would blow the whole thing out of the water, so one of the more substantial things we did was work on our energy consumption," says Gary Glawe, senior director of ballpark systems.

Getting the building and operations running smoothly took priority. "In truth, we were first focused on getting business up and running, as well as the guest experience. We put the EBOM energy efficiency part of it on the back burner at first and waited for our energy data to play out before we made operational changes," Glawe explains.

After the Twins became more comfortable with their new building's operations, they began to address opportunities for increased efficiency. "We took the systems already in place and began using them more efficiently, such as building out some of them," Glawe explains. "Areas that are unoccupied for the season are only scheduled when we need them. The first year, I was scared to put in automatic lighting because I was afraid it would shut off in the middle of an event. But we gained confidence in that first year and scheduled the whole facility to shut down at a certain time in the day because people were leaving lights on. We really engaged our office

STANDOUT GREENING ACCOMPLISHMENTS

- ★ A power purchase agreement offset 70 percent of energy consumption at the stadium with wind energy in 2010 and 2011, avoiding more than 8.8 million pounds of carbon dioxide emissions.
- ★ Captured waste energy from the adjacent Hennepin Energy Resource Center is used to heat most indoor spaces at Target Field and the playing field.
- ★ High-efficiency field lighting saves nearly $6,000 a year.
- ★ Fans are encouraged to use public transportation or bike to games. Two rail lines stop near the left-field corner, a Metro Transit bus hub is less than a block away, and 427 bicycle storage locations are within 200 yards of the ballpark.
- ★ A water cistern system under the warning track captures and treats rainfall runoff, which is filtered and used to wash down the seating area after games, with potential field irrigation uses in the future.
- ★ Low-flow urinals, dual-flush toilets and aerated faucets use 30 percent less potable water than conventional fixtures and are estimated to save 4.2 million gallons of water annually.
- ★ The Twins reduced the use of chemical cleaning compounds by 66 percent in 2011 from the previous year, and 73 percent of cleaning compounds met the USGBC's LEED standards.
- ★ The stadium diverts 47 percent of its waste for recycling and composting, with all other waste going to waste-to-energy.
- ★ The stadium donated 7,500 pounds of leftover food to local charities in 2011.

staff and made an objective to reduce energy consumption by at least 5 percent. It made everyone aware to turn off lights, turn off computers, those kinds of things."

Through lighting and HVAC upgrades and better automation of equipment in 2011, the Twins reduced their use of electricity by more than 12 percent, despite adding a new video board in right field and additional radiant heating units in the concourses. Target Field is an EnergyStar Portfolio Manager member and as of 2012 was 23 percent more energy-efficient than other buildings in its EnergyStar category.

Another challenge during the LEED process was waste management. "We started our composting back in April 2010, when we opened," says McEvoy. "We ran into a number of challenges with how to get things to one location for pickup and working with our housekeeping and concessionaires. We had to do some redesigning of compactors and added a couple of totes to get things from the kitchen to the compactors. It wasn't until mid-August 2010 that we had it clean enough to go to the compost site."

"I don't think we really got serious about it until July 2011 when we realized our diversion rate wasn't as good as we thought it was. As part of the LEED process, we tried to get a 50 percent diversion rate. We just missed that, so we then did a waste audit," explains McEvoy. "We were at 37 percent [diversion] in 2010. Our highest diversion rate now is 47 percent, as of last year. We hope to be above the LEED requirement level by the end of this season."

"We started our composting in the suites because it's easier to control in this central, sealed-off location. Also, some of those compostable products are a little more expensive than regular products. In terms of the bottom line, it was cheaper to buy those products for a small area instead of an entire ballpark. But we'll start there and go from there. I think we'll get close to a 100 percent diversion rate someday," says McEvoy.

"To try and collect more organics and recyclables, we have a crew that picks up all the recyclables out of the seating area after the games. The second crew comes in and picks up all the trash. Everything left over is organic. We do it with blowers and brooms. After that we started dealing with popcorn boxes and pizza boxes. Some of the things that we vend from our concessionaries aren't Biodegradable Products Institute–certified compostable, but they are paper waste so we can compost them. We were collecting 22 cubic yards per game last year."

The Twins emphasize simplicity and easily understood signs when it comes to recycling programs. "My advice is to make your waste system as simple as possible. Signs are a big thing, especially in the kitchen. Color-coded and multiple-language signs make it so everyone can read and understand. You should also make sure that whatever you choose fits with everyone else's operation," says McEvoy. Working with suppliers and training staff is also crucial. "We talk directly to the concessionaire folks and the warehouse people. We have six major kitchens in the ballpark. We went to each chef in those kitchens and got them all on board. From there they spread it out to their kitchen area. Once we got everybody on board it worked out really well."

In 2011, the Twins kept more than 1,762 cubic yards of waste out of local landfills, and 741.3 tons of trash were sent to the Hennepin Energy Recovery Center, a waste-to-energy facility neighboring Target Field. This recovered energy was used at Target Field to heat portions of the service level and provide hot water in the facility. In addition, 430.67 tons of waste were recycled, and 152.41 tons of organic materials were composted.

Diverting their waste from landfills makes economic sense for the Twins. "The good thing about our waste composition is that it is much cheaper to go organic. It costs $65 a ton to haul trash and $15 a ton to haul organics," says McEvoy. By composting more than 152 tons of organics in 2011 instead of landfilling them, for example, the Twins saved $7,600.

"ONE THING THAT I AM IMPRESSED WITH WHEN I WALK AROUND THIS FACILITY ON AN EVENT DAY, WITH OUR THOUSANDS OF EMPLOYEES AND TENS OF THOUSANDS OF GUESTS, IS THAT THIS WHOLE THING HAS BECOME SO WIDELY ADOPTED THAT IT'S JUST SECOND NATURE," says Dave Horsman.

LESSONS FROM THE FIELD

USE LEED AND OTHER CERTIFICATIONS AS A REFERENCE: "When we started our Green Program in 2008, as tenants in the Metrodome, we didn't have recycling bins in our office. The LEED certification pushed us in the right direction," says McEvoy. "Teams out there that are looking to start a sustainability initiative, if they pick a certification, whether it's LEED or ISO, it gets them on the right track. I can't say for sure, but without LEED we probably wouldn't have an actual purchasing policy or a durable goods policy. LEED has given us a more holistic approach to our sustainability operation."

USE AN INTEGRATED BUILDING APPROACH: "Without a doubt we advocate for LEED to others, but it's not just the LEED side of it. Because of our fully integrated approach, we ended up with a building that is very functional. Without a fully integrated approach you end up lacking in one area or another," Glawe says. "We didn't move into this facility until 2010, but we started talking about LEED in early 2009. We thought, 'What can we do now to help us a year from now or two years from now?' We made our vendors follow the regulations; we made engineering changes throughout the process. Thinking far enough in advance during the construction process helped us move forward a little bit easier."

LEED DOESN'T HAVE TO BE EXPENSIVE: An integrated building approach can also help keep costs down. "During the NC project, the overall cost of the LEED component was 0.5 percent of the overall budget, on the construction side. The LEED cost is only 2 percent above of what your building cost should be," explains Glawe. "I think a lot of that has to do with going into the whole process with objectives of environmental stewardship. We weren't going back to the drawing board as often because it was frontline for everyone at the beginning. That helps keep cost down."

TURN LOCAL ENVIRONMENTAL ISSUES INTO OPPORTUNITIES, AND TAKE ADVANTAGE OF LOCAL RESOURCES: "Our rainwater recycle system is the perfect example of taking advantage of opportunities presented to you," says Horsman. "With the advertising potential, it was a good partnership for Pentair to put that system in for us. If they hadn't put it in, I'm not sure that it could have been done." Glawe adds, "That was a partnership piece with a local company that wanted the exposure. It's a win-win. We gain a corporate partner and they gain a chance to advertise their service. The benefit goes both ways."

MAKE ENVIRONMENTAL INITIATIVES PART OF YOUR CULTURE: Horsman notes that the process of adopting a greening initiative depends on the facility, with facility operators responsible for energy and sustainability decisions from the beginning. "One thing that I am impressed with when I walk around this facility on an event day, with our thousands of employees and tens of thousands of guests, is that this whole thing has become so widely adopted that it's just second nature," says Horsman. "Our senior management made this an objective and put the responsibility on operations folks to come up with meaningful ways to do this, and that has made it easy to propagate it on down the line. It's impressive to see ushers, who are part-time employees, doing sustainable things as second nature. Nobody has to make a concerted effort anymore because it's just part of what they do. If you're going to have success, that's got to be a part of it." "It has to become part of your culture," McEvoy adds. "That never made a whole lot of sense to me until I saw it firsthand."

ENDNOTES

1 Brian Johnson, "LEED Amendment Survives in Twins Stadium Bill," Finance & Commerce.com, May 30, 2006, http://finance-commerce.com/2006/05/leed-amendment-survives-in-twins-stadium-bill/ (accessed July 19, 2012).

2 "Twins' Target Field Gets Highest LEED Rating of Any Ballpark in America," MLB.com, April 8, 2010, http://minnesota.twins.mlb.com/news/article.jsp?ymd=20100408&content_id=9142070&vkey=news_min&fext=.jsp&c_id=min (accessed July 19, 2012).

CASE STUDY

AMWAY CENTER, HOME OF THE ORLANDO MAGIC

ARENA STATS

Location: Orlando, Florida

Began Construction: July 25, 2008

Opened: October 1, 2010

Seating Capacity: 18,846

Owner: City of Orlando

Operator: Orlando Venues

Venue Uses: NBA and collegiate basketball; lacrosse, arena football and hockey games; and a variety of concerts

Construction Cost: $512 million (in 2012 dollars)

LEED Certification: LEED Gold-Certified for New Construction (NC), October 1, 2010

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

In October 2010, the Amway Center became the first LEED Gold–certified designed and constructed professional basketball arena in North America. Today it remains the only NBA arena to be awarded LEED Gold certification within the New Construction standard. The arena uses approximately 25 percent less energy and 40 percent less water than arenas of similar size and type, saving the team hundreds of thousands of dollars each year—including close to $700,000 annually in energy costs alone.

As a sports industry leader in advanced green building approaches for venue construction, the Amway Center is a local and national role model for efficiency and environmental stewardship. The Magic have worked hard to spread the green message embodied in their arena to fans nationwide, including through their role as hosts of the 2012 NBA All-Star Game.

WHY GO GREEN?

The Magic recognized the significant financial benefit of investing in a resource-efficient building for their new arena early in the planning process. From the outset, their operations team also had the mission of building a unique venue that would be a sustainability role model for the Orlando community. According to Orlando Magic CEO Alex Martins, the Magic are devoted to corporate social responsibility that has a positive impact citywide. "Amway Center is living up to its expectations," Martins said at the unveiling of the LEED Gold award. "We promised to create an arena that was civic-oriented, pedestrian-friendly and added to downtown development. We promised a sustainable arena, and are proud to say that with today's announcement and with great teamwork, we have surpassed our goal for LEED certification."[1]

The Magic's design team was driven to establish the Amway Center as a community symbol of sustainability, efficiency and green design throughout the development process. "Amway Center's sustainable reach is well beyond the LEED certification," said Brad Clark of Populous, the arena's designer, at the certification announcement. "Not only did we achieve something that few other sports buildings have, but we've created a building that is a sustainable community gathering space, and that was the driving force behind the design."[2] The Magic recognize that they can best commit to greening by using their prominent arena to communicate the green message and through leading by example.

WHERE TO START?

"We started researching environmental certifications in December 2006, six months prior to our project approval, which was in June 2007," says Charles Freeman, executive vice president and chief revenue officer for the Magic. "We created a sustainability team to discuss and work on the green certification process. We brought in a couple of representatives from each of the parties involved in the arena development, which consisted of our development team, including Turner Construction and Hunt Construction, the City of Orlando, TFC Engineering, and Populous, our designer. We got together on a weekly basis to research certification options, and we eventually chose LEED as the right standard for us at that time and place."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ Nearly 90 percent of construction waste, including more than 8,000 tons of wood, concrete and steel, was diverted from landfills.
- ★ Over 20 percent of the facility's building materials included recycled content, and 30 percent came from local sources.
- ★ High-efficiency systems at the Amway Center consume approximately 25 percent less energy than a comparable code-compliant design. This saves nearly $750,000 a year.
- ★ Water used inside the building was reduced by 40 percent through the use of high-efficiency water closets, urinals and lavatory faucets, and low-flow plumbing fixtures like dual-flush toilets, resulting in savings of more than 800,000 gallons of water per year.
- ★ Rainwater and air-conditioning condensation are captured and stored onsite in a 5,000-gallon cistern and used for irrigation.
- ★ Preferred parking spots have been designated onsite and in the adjacent parking garage for low-emitting vehicles and carpools.
- ★ Multiple bus lines, a future light-rail system near the site, and bicycle parking racks on or near the site encourage alternate transportation to events.
- ★ The Amway Center uses only environmentally friendly cleaning products.
- ★ Both the roof of the building and the hardscape areas around the building have been designed to minimize daytime heat gain and subsequent nighttime release.

By using an integrated approach, the Magic were able to both rely on the expertise of their many development partners for the green building work and ensure that all were committed to the team's environmental objectives. "We had about 15 folks meeting to discuss environmental issues more generally to begin with, and then we narrowed it down to achieving LEED certification for our new arena," says Freeman. "We have no 'sustainability director,' as we try to reinforce that greening is a kind of philosophy throughout the operations team at the Amway Center."

Freeman explains that because all departments were committed to the LEED process, the Magic's sustainability team was able to set high standards for the project. "The Magic support LEED all the way up to the DeVos family—which includes the owner, chairman and other significant Magic executives—as does the mayor of Orlando," explains Freeman. "Early buy-in from the top and from all team members made our certification a success. Our goal was to achieve a minimum of LEED Silver, and we were awarded LEED Gold."

During 2009 the Magic worked with a consultant to measure and evaluate the environmental impacts of their former arena, the Amway Arena. "We hired a consultant, International Carbon Bank & Exchange, several years ago to conduct an energy, paper and water audit to assess our carbon footprint," says Freeman. His team sought to improve operations at the new Amway Center by better understanding their resource use at the old arena. "We also wanted the consultant to create an educational awareness campaign for our fans and employees," he explains.

To best integrate their environmental agenda organization-wide, the Magic sought buy-in from staff in all departments. "We had visionary sessions and had each of the departments nominate an ambassador to effect daily operations and create solutions," says Freeman. "For example, to minimize waste we implemented a comprehensive recycling program throughout the old building and new building. We worked with Rock and Wrap It Up! to take the leftover prepared food from all games and deliver it to local shelters and food banks."

To better engage fans on green issues, the Magic became one of the first teams to partner with PepsiCo to incentivize recycling, with immediate rewards. "We installed a Pepsi Dream Machine in the Amway center in a partnership with PepsiCo," reports Freeman. "The Dream Machine is an initiative that rewards fans for recycling on the go. For every bottle or can you return, you receive coupons for Pepsi products at various retail locations."

CHALLENGES: OVERCOME AND ONGOING

From the outset the Magic's operations team recognized that pursuing LEED certification is often an expensive process and requires significant capital outlay in order to invest in advanced and efficient technologies. "We made sure we started putting money aside even before we got into the design process," says Freeman. "We put money aside to make sure we could manage the up-front investments needed to achieve the LEED certification, and ultimately the LEED Gold level." Nevertheless, the Magic sustainability team expected to quickly recoup the initial outlay with significant resource savings. In fact, the Amway Center's high-efficiency systems use about 25 percent less energy and save the team nearly $750,000 every year, relative to a comparable code-compliant design.

"Setting the goals and the parameters at the front end helped us achieve LEED Gold. We took the time, the energy, the resources and the money to do it right and help the environment," Freeman explains. "Building an arena is a complex task. Setting our goals early made it efficient and effective, allowing us to maximize how environmentally friendly we could be because we thought about it from the beginning."

"THE AMWAY CENTER IS ONE OF OUR MOST VISIBLE EXAMPLES OF HOW THE CITY AND OUR PARTNERS ARE EMBRACING SUSTAINABLE PRACTICES AND WILL ALLOW US TO FURTHER ENGAGE THE COMMUNITY IN THE EFFORT TO 'GO GREEN,'" says Orlando Mayor Buddy Dyer.

Because the Magic were starting from scratch on their new arena, they were also able to integrate green efficiency measures that rely on optimizing the building's orientation. "We have minimal use of glass on the east and west sides of the Amway Center, which helps with the high-level insulation energy efficiency for the project," says Freeman. "The glass that is prevalent on the north side of the building is out of direct sunlight and thus doesn't sacrifice energy performance. We also orient the windows to minimize heat gain." The Amway Center's downtown location also provides fan access to and from the city center with multiple bus lines. "There are bicycle racks and parking spots for high-efficiency vehicles," he adds, "and a direct rail system in the works."

The Magic's operations team continues to work closely with city officials to expand and improve their green programs. "We have weekly meetings with the City of Orlando, and we continue to talk through the green initiatives throughout the year," says Freeman.

LESSONS FROM THE FIELD

SET GOALS EARLY: Freeman strongly emphasizes the importance of early research and goal-setting to best accomplish the system-wide improvements and greening initiatives that have the greatest payoff. "Set your goals as early as possible, and set aside the resources and the capital to achieve them," he advises. "Setting our goals early made it efficient and effective, allowing us to maximize how environmentally friendly we could be because we thought about it from the beginning."

DON'T FEEL RESTRICTED BY THE LEED POINT SYSTEM; INCORPORATE YOUR OWN INITIATIVES: According to Freeman, one of the interesting things that the Magic's operations team learned during the LEED process was how to incorporate efficient green practices that made sense for the Amway Center but weren't necessarily part of the standard. "For example, we run on a chilled water plant, and the LEED certification never really included recognition for having a centralized chilled water facility," says Freeman. "So we had to work with the U.S. Green Building Council to ultimately create a new chilled water facility that provided all the air-conditioning. While our LEED certification didn't take into consideration our chilled water system, we had to make it effective for future groups to use the same technique. We were able to have those discussions and make our chilled water system more efficient. As chilled water was not in the LEED certification process when we pursued it, we had to integrate it ourselves."

TAKE ADVANTAGE OF THE LEAGUE PLATFORM FOR EXTRA PRESS: The Magic piggyback on the NBA's national green campaigns to draw awareness to their advanced sustainability work in Orlando. "NBA Green Week is our big platform for environmental outreach. We rally around that week so that our fans become more environmentally aware, but obviously we continue having many ongoing green initiatives during the year as well," says Freeman. "The NBA has an environmental campaign, NBA Green, on the national level and we take it locally to impact our fans in Orlando, regionally and elsewhere."

ENDNOTES

1 www.nba.com/magic/news/amwaycenter_goldcertification_040711.html.

2 Ibid.

CASE STUDY

BUSCH STADIUM, HOME OF THE ST. LOUIS CARDINALS

BALLPARK STATS

Location: St. Louis, Missouri
Began Construction: January 17, 2004
Opened: April 10, 2006
Seating Capacity: 46,000
Owner: St. Louis Cardinals, LLC
Operator: St. Louis Cardinals, LLC
Venue Uses: MLB baseball games and concerts
Construction Cost: $421 million (in 2012 dollars)[2]

THE CARDINALS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The St. Louis Cardinals are one of the most award-winning teams in baseball. Since they joined the National League in 1892, the Cardinals have won 11 World Series Championships, 18 National League Pennants, 8 National League Central Division Titles, 3 National League Eastern Division Titles, and more than 9,300 games.[1]

The Cardinals have also been earning accolades for their green efforts, including the St. Louis Green Business Challenge Award of Achievement, the Missouri Waste Coalition Environmental Stewardship Award, and the Downtown St. Louis Community Improvement Sustainability Award. Thanks to the strong commitment of their operations staff and front office team, the Cardinals have achieved a 29 percent waste diversion rate, a 23 percent reduction in overall energy use (and base power demand), and a 10 percent cut in water use across all operations since opening their stadium just five years ago. With a solar array newly installed in 2012, the Cardinals continue to set the bar high on and off the field.

WHY GO GREEN?

The Cardinals see greening and efficiency as an integral part of operating Busch Stadium in an economically and socially responsible way. "Since day one, operating this building in an effective manner has been a prime objective," says Joe Abernathy, vice president of stadium operations at Busch Stadium. "We've always been a proponent of continuous improvement in what we do and how we do it." For the Cardinals, this improvement involves both operational efficiency and the bottom line, as well as being a community and sports-industry role model.

As the former president of the Stadium Managers Association as well as longtime VP of Busch Stadium Operations, Abernathy views greening as an imperative not only for the Cardinals, but also for Major League Baseball (MLB) as a whole. With more than 20,000 fans attending most MLB games, Abernathy sees baseball, our national pastime, as an important mouthpiece for environmental stewardship. "I think collectively we could make a difference," he says.

> **"WE LOOK AT [GREENING THE STADIUM] MORE AS A JOURNEY OF CONTINUOUS IMPROVEMENT, RATHER THAN ATTAINING A GOAL OR DESTINATION,"** Joe Abernathy says.

Abernathy hopes that the Cardinals' green efforts will help spur further action by all 30 MLB teams, and other sports teams in the Midwest, to become more efficient and environmentally intelligent. "If we can get other stadiums measuring their resource use and greening, then we can use that data to start identifying which buildings out there are operating better than others, and maybe there are individual processes or techniques they have that they can teach the rest of us to do too," he explains.

The Cardinals' interest in greening has also been encouraged by the growing green buildings and sustainable operations movement in the United States. "We caught that wave and are continuing to do what we've done all along as far as running an efficient operation." According to Abernathy, efficiency is just as important for Busch Stadium as any building or business that wants to save money on operating costs. "We're just basically running a building that houses baseball games," he says.

WHERE TO START?

"When it comes to stadiums and sustainable operations, reducing energy use is the place to start," says Abernathy. "The cost of energy to run a stadium is typically 15 to 20 percent of our total stadium operations budget. So when we were able to reduce our energy use by 23 percent, it had a significant impact on the bottom line—for us, saving up to $150,000 annually. It all starts with knowing what your energy consumption is."

One key to the Cardinals' energy success right off the bat was the operation team's initiating data tracking using the EPA's free EnergyStar Portfolio Manager. "Signing up as an EnergyStar Partner and using their Portfolio Manager tool to help us track and better understand our energy consumption was a great start," says Abernathy. "It's a tool in which business operators can keep track or measure their energy use. It takes into account the weather, so it gives you a statistic at the end of the process that can help you gauge how efficiently you're using your energy."

Abernathy explains that the Portfolio Manager helps his team better analyze their data and understand when they've achieved real savings. "I had been tracking my energy use outside of Portfolio Manager, but did not have a way to normalize the data for weather," says Abernathy. "Portfolio Manager can do that and showed that the energy reduction was real—and not just the result of mild weather."[3] The Portfolio Manager helped the Cardinals prove that since 2007 they've cut the ballpark's energy use by 23 percent—down to 161.2 kBtu per square-foot from 211.8—after normalizing for weather. This saved the team more than $300,000 in energy costs between 2007 and 2010. According to EPA EnergyStar, this puts Busch Stadium at an energy performance level that is 39 percent better than the national average for entertainment buildings (265 kBtu/sq. ft./year).[4]

Next the Cardinals worked on "getting the workforce engaged in that process, using their help to identify potentials for our improvement and making that happen," says Abernathy. During the 2008 season, Abernathy's team began by piloting the "4 a Greener Game" green team program where volunteers work in coordination with Cardinals staff to collect recyclables throughout the ballpark during every home game and educate fans about the Cardinals green initiatives.[5] Their very successful initial two-month pilot project was expanded to a permanent green team program that is now made up of an average of 25 volunteers and continues to grow year by year.

Thanks to this well-established green team, the Cardinals have diverted more than 1,836 tons of recyclables, including more than 575 tons of compostable yard waste, from local landfills. The program also encourages the approximately 3 million fans who come to games each year to use the 550 recycling bins around the ballpark. In addition, the Cardinals have devoted maintenance staff to separating out additional recyclables from garbage bags post-game.

To build on the momentum around their "4 a Greener Game" program and ongoing recycling successes, the Cardinals established a green mission statement and environmental commitment to help direct their green work and educate their fans. The mission statement is posted on the Cardinals' website, which draws more than 32.7 million visitors in season and more than 13 million unique visitors a month. The statement begins: "The St. Louis Cardinals are committed to promoting environmental stewardship and sustainability. Our goal is to put a winning team on the field and create a safe, fun, family friendly environment and entertainment experience for our guests while minimizing the impact on the natural environment."

CARDINALS' GREENING MISSION STATEMENT

"The St. Louis Cardinals are committed to promoting environmental stewardship and sustainability. Our goal is to put a winning team on the field and create a safe, fun, family friendly environment and entertainment experience for our guests while minimizing the impact on the natural environment. Specifically, the Cardinals will:

- ★ Strive to minimize pollution and waste through programs designed to reduce and recycle the consumable materials we use throughout our operations.
- ★ Conserve energy and water, support renewable energy resources, and encourage environmentally sound transportation options for employees and fans.
- ★ Identify and purchase environmentally friendly products and services for all stadium and team operations."

STANDOUT GREENING ACCOMPLISHMENTS

- ★ The Cardinals' "4 A Greener Game" program, launched in 2008, is credited with recycling more than 1,836 tons of solid waste, more than 575 tons of yard waste, and more than 110 tons of composted organic material.
- ★ The team's concessionaire, Delaware North Sportservice, has donated more than $159,000 worth of food to Operation Food Search, a local food bank, with a waste diversion rate of 29 percent.
- ★ The Cardinals have reduced their energy use by 23 percent and water use by 10 percent since the stadium opened in 2006.

Busch Stadium has instituted several low-cost and no-cost energy-saving measures, including:

- ★ Using compact fluorescent lights throughout the stadium.
- ★ Installing occupancy sensors in several rooms.
- ★ Fine-tuning existing operating systems, such as pumps and blowers in the HVAC system.
- ★ Using a lighting control system.
- ★ Repairing and improving building insulation.

THE GREENING PROGRAMS BEHIND THE CARDINALS' GREEN AWARDS

The Partnership for Downtown St. Louis and the Downtown Community Improvement District—Sustainability Award: To celebrate the 40th anniversary of Earth Day, the St. Louis Cardinals hosted an e-cycling drive, collecting unwanted electronics in the Ballpark Village Lot. During this first annual two-day event, more than 1,500 people dropped off their unwanted electronics, filling 14 tractor trailers and diverting 158 tons of electronics from the landfill.

St. Louis Green Business Challenge—Award of Achievement: The St. Louis Green Business Challenge encourages companies to adopt sustainable practices by forming Green Teams, conserving energy and water, reducing waste, improving indoor environmental quality, and providing clean transportation options. The St. Louis Cardinals documented data to help sustain, share, and promote the efforts made through the St. Louis Green Business Challenge.

Missouri Waste Coalition—Environmental Stewardship Award: The Cardinals reduced pollutant emissions or consumption of natural resources using methods that are both environmentally and economically sustainable and showed documented results both before and after implementation.

WasteWise Partner: The St. Louis Cardinals were given the award for demonstrating commitment to waste reduction by the EPA.

The Bridge—Certificate of Appreciation: This certificate was received in recognition of the St. Louis Cardinals' valuable contribution to reclaiming and providing food for The Bridge, a shelter for homeless and at-risk people in St. Louis.

"THIS IS ALL PART OF THE ST. LOUIS CARDINALS' COMMITMENT TO GREEN ITS GAME," says Abernathy. **"SINCE THE STADIUM OPENED IN 2006, WE'RE PROUD TO SAY THAT WE'VE BEEN ABLE TO CUT OUR ENERGY USE BY 23 PERCENT AND WATER USE BY 10 PERCENT." THIS SAVED THE TEAM MORE THAN $300,000 IN ENERGY COSTS.**

CHALLENGES: OVERCOME AND ONGOING

Given that Busch Stadium opened relatively recently (in 2006), the Cardinals are justifiably proud of having achieved a 23 percent reduction in energy use since that time, and Abernathy's team is working hard to continue the trend. In fact, plumbing, lighting, and HVAC (heating, ventilation, and air conditioning) technologies have improved significantly over the last five years, enabling the Cardinals to upgrade their systems significantly over a short period.

The Cardinals' operations team and Microgrid Energy, Busch Stadium's energy manager, undertook an "investment-grade" energy audit in 2011 to identify additional energy-efficiency measures for the ballpark. They found close to 200 cost-effective energy improvements that formed the basis for the Cardinals' comprehensive energy-efficiency strategy, including no-cost or low-cost controls systems optimization and potential capital upgrades. As of mid-2012, the team is a third of the way through systematically executing their list of energy-efficiency measures, with plans to complete them all. "We looked for simple ways to reduce energy use, like setting back thermostats, turning off lights, and keeping doors closed. Then we moved into investing in lighting retrofits, retro-commissioning, and renewable energy projects. Along the way we took advantage of energy-reduction grants and rebates offered by our local utility and government agencies," explains Abernathy. "We look at it more as a journey of continuous improvement, rather than attaining a goal or destination," says Abernathy.[6]

For example, the Cardinals have replaced more than 1,000 traditional spotlights and floodlights with LED lamps to cut lighting power demand in several areas around the ballpark by 90 percent. The team also implemented a ventilation control scheme in electrical rooms to eliminate the year-round use of the equivalent of a hefty 100-ton air conditioner. Abernathy's team has similarly installed smaller, dedicated cooling systems for the scoreboard control room and video coaching room to substitute for very large HVAC units better suited for larger areas.

Additionally, the Cardinals have changed the operation and controls on pumps and installed a new heat exchanger so that the steam plant is now able to recover heat from waste condensate (from the system that brings hot water to the showers and HVAC systems). This reduces the amount of heat that must be generated for other applications and eliminates the need for pumping 5 million gallons of cooling water.

All told, the Cardinals have invested several hundred thousand dollars and are saving that much each year. The return on investment for most of their initiatives is typically less than a year, allowing the team to use the savings to improve their operations and the bottom line in other ways. "This is all part of the St. Louis Cardinals' commitment to green its game," says Abernathy. "Since the stadium opened in 2006, we're proud to say that we've been able to cut our energy use by 23 percent and water use by 10 percent."[7]

Most recently, the team unveiled a new 106-panel solar array atop a ticket building and concession area at one major entrance to the ballpark. The U.S.-manufactured array will produce approximately 32,000 kWh of energy annually, enough to power the stadium scoreboards or cook about 4 million hot dogs.

"We've installed a 25-kilowatt solar array that gives us the ability to generate enough clean energy to power all of the retail stores at the ballpark. It's not a whole lot of energy, but every little bit helps," says Abernathy. "We think it's a great way to demonstrate how solar works and how renewable energy works in St. Louis. We hope to be a proponent of clean energy and educate our fans about the importance of renewable energy."[8]

LESSONS FROM THE FIELD

USE EPA'S ENERGYSTAR PORTFOLIO MANAGER TO HELP TRACK AND MANAGE YOUR ENERGY DATA: Abernathy explains that the Portfolio Manager helps his team better analyze their data and understand when they've achieved real savings. "I had been tracking my energy use outside of Portfolio Manager, but did not have a way to normalize the data for weather," says Abernathy. "Portfolio Manager can do that and showed that the energy reduction was real—and not just the result of mild weather."

USE AUDITS TO IDENTIFY BOTH SHORT-TERM AND LONG-TERM OPPORTUNITIES TO SAVE: The Cardinals' operations team and Microgrid Energy, Busch Stadium's energy manager, invested in an "investment-grade" energy audit in 2011 to identify additional energy efficiency measures for the ballpark. They found close to 200 cost-effective energy improvements that formed the basis for the Cardinals' comprehensive energy efficiency strategy, including no-cost or low-cost controls systems optimization and potential capital upgrades.

CARDINALS USE GREENING TO BE A COMMUNITY LEADER

In March 2012, the Cardinals teamed up with the Natural Resources Defense Council to host a tour and discussion of the improvements they've made to their energy systems at Busch Stadium. About 25 energy leaders from Missouri—including representatives from the local electric utility, state energy regulators, environmental advocates, and the energy management team at Microgrid Energy—had the unique opportunity to hear a first-hand account of the energy efficiency work implemented at Busch Stadium.

A GREENER GAME

©Microgrid Solar

ENDNOTES

1 http://stlouis.cardinals.mlb.com/stl/ballpark/facts/index.jsp.

2 http://www.ballparks.com/baseball/national/stlbpk.htm.

3 http://www.energystar.gov/ia/business/entertainment/Success_Story_St_Louis_Cardinals.pdf.

4 The Energy Information Administration's Commercial Building Energy Consumption Survey (CBECS) indicates that the average energy intensity of an entertainment facility is 265 kBtu/sq. ft./year; http://www.energystar.gov/ia/business/entertainment/Success_Story_St_Louis_Cardinals.pdf.

5 http://stlouis.cardinals.mlb.com/stl/community/green.jsp.

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CASE STUDY

AIR CANADA CENTRE, HOME OF THE TORONTO MAPLE LEAFS AND RAPTORS

ARENA STATS

Location: Toronto, Ontario

Began Construction: March 12, 1997

Opened: February 19, 1999

Seating Capacity: 19,800 (20,511 with standing room)

Owner: Maple Leaf Sports & Entertainment

Operator: Maple Leaf Sports & Entertainment

Venue Uses: NBA, NHL, and NLL games, concerts, political conventions

Construction Cost: $342 million (in 2012 dollars)

AIR CANADA CENTRE GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

One of the busiest arenas in the world, Air Canada Centre holds an average of 180 ticketed events with 2.75 million attendees coming through the building each year. Beginning in 2008, Maple Leaf Sports & Entertainment (MLSE), owners of the Toronto Maple Leafs, the Toronto Raptors, and Air Canada Centre, launched "Team Up Green," a five-year plan that set environmental goals for the arena. The sustainability plan specifically set goals to reduce energy use by 30 percent, reduce the arena's carbon footprint by 30 percent, and divert 95 percent of waste from landfills by 2013—and they are close to meeting these goals. The arena has already met their carbon reduction goal two years early and they are diverting 74 percent of their waste from landfills. Energy use at the facility has also been reduced considerably, though the arena is waiting for an external audit to confirm this measurement.

"WE TOOK A PRACTICAL LOOK AT THE CHALLENGE AND STARTED WITH THE MOST LOGICAL PROCESS—CAN WE OPERATE MORE EFFICIENTLY? CAN WE MODIFY THE WAY WE DO THINGS TO MAKE THEM MORE EFFICIENT?" explains Bryan Leslie, director of building operations.

WHY GO GREEN?

When Bryan Leslie, director of building operations and Team Up Green, joined the operations team at Air Canada Centre in 2007, senior management challenged him to create a viable environmental program at the arena. "I started with the company in 2007, and before I arrived there were not many environmental initiatives in place, but there was a lot of interest," says Leslie. "I had experience with greening working for the federal government at a military base where we practiced demand response, deconstruction instead of demolishing, and energy-efficient lighting retrofits."

"As for the kick-off of Team Up Green, it really was senior management that saw the need to investigate the environmental possibilities of the facility," Leslie continues. "They had a good handle on our league's environmental development, and wanted to be at the forefront of this important initiative," Leslie explains. The MLSE Team Up Green mission statement reflects this objective: "Maple Leaf Sports & Entertainment is committed to being a responsible corporate citizen and leader in the community. To this end, it has created a committee dedicated to reducing the company's and its venues' environmental footprints."[1]

WHERE TO START?

"The lucky part, and the great news about the green program, is that our board of directors and senior management were engaged and interested at the very beginning," says Leslie. "They told me that if we could develop an environmental plan that met our objectives, we could have the funding to get the job done. Our designed capital plan was $5 million over 5 years."

Air Canada Centre's sustainability program began with a comprehensive plan. Over the course of 2007 Leslie and his operations team set objectives, developed a budget, and worked with senior management to determine reasonable and feasible goals to strive for. "We thought, what's reasonable for an arena whose main focus is sporting and concerts in terms of waste diversion and reducing utility costs?" says Leslie. "We had a corporate partner—a

STANDOUT GREENING ACCOMPLISHMENTS

- ★ Reduced carbon emissions by 30 percent from 2007 to 2011
- ★ Use deep-lake water cooling, which eliminates the need for air-conditioning compressors
- ★ Use steam produced centrally instead of using many boilers
- ★ Upgraded lighting to LED and T8 lighting throughout the venue and office tower, estimated to reduce energy use by 1.34 million kWh
- ★ Installed occupancy sensors and lighting controls on office floors to reduce light levels
- ★ Employ overnight temperature set back
- ★ Installed variable speed drives on pumps and fans
- ★ Installing high-efficiency HVAC system
- ★ Updated refrigerators to EnergyStar-rated models
- ★ Proactive internal program aimed at reducing electricity usage and plug load in office tower
- ★ Reduced landfilled waste by 74 percent from 2007 benchmark through a combination of source reduction, recycling and composting, averaging 55 to 60 percent monthly diversion rates in 2012
- ★ Use tri-sorters to separate organics and recyclables
- ★ Divert 500 metric tons of organic materials annually, which is composted at a local farm and resold as soil
- ★ Purchase post-consumer recycled paper products
- ★ Sell or donate old furniture instead of sending to landfills
- ★ Donate approximately 15,000 pounds of unused food to Second Harvest Food Bank annually
- ★ Reduce packaging where possible and switched from cardboard box delivery to reusable plastic containers
- ★ Recycle fryer oil for conversion to biofuel
- ★ Shifting to bio-based/organic packaging materials
- ★ Use environmentally friendly cleaning supplies and chemicals, including Green Seal and Eco Logo certified products
- ★ Installed sensors and aerators on faucets
- ★ Filter ice-making water through reverse osmosis, instead of treating chemically
- ★ Treat the water in ice-making plant with "anode technology" instead of with chemicals

local utility, Direct Energy—that also saw a market for environmental planning. They did a lot of background research in conjunction with us, measuring our utility usage, how our waste stream was being managed, etc. We had a lot of brainstorming sessions where we bounced around ideas about what is reasonable, what is sensible. We tried to build a matrix of ideas for the entire five years, starting with what's practical and moving up from there."

In order to formulate these sustainability goals, the operations team needed to collect baseline data about the arena's operations in order to track their current consumption. "To benchmark our processes, we conducted a survey of all systems in the building, auditing the waste stream, utilities, and general operational processes using an outside consultant to ensure that we could create goals that were attainable and measurable," Leslie explains.

As a result, three main goals were officially set as organizational objectives in 2008: a 30 percent reduction in energy use, a 30 percent reduction in carbon footprint, and reducing waste going to landfills by 95 percent. "[The last was] our most lofty goal," says Leslie. "But I'm adamant about having every piece of scrap out of landfill if I can do it."

Once the objectives were in place, "we took a practical look at the challenge and started with the most logical process—can we operate more efficiently? Can we modify the way we do things to make them more efficient?" explains Leslie. "We looked at really basic things: creating tri-sorters for separating recyclables, diverting our waste, looking at the lighting. The first thing we did was figuratively put on green hats. Without pulling out our wallets, what can we do differently, based on what we have today, to be more efficient? Let's think more effectively."

They started with small, cost-saving changes. "By turning off lights when not needed, by reusing materials, by making the HVAC system operate on a tighter timeline, we reduced utilities by 5 percent in the first year," he says. "We changed the way we operate and saw an immediate impact through using practical green sense. These changes for the most part were free, and set the stage to start modifying our operation more broadly."

After the low-hanging fruit, Leslie and his team went after larger, more nuanced projects in the building. Fortunately they were able to tap into the highly efficient infrastructure of downtown Toronto. "This building is lucky in that we don't have a boiler and we don't have a chiller to cool the air. We are proud of the fact that we use a system called 'deep lake water cooling,' which is available here in downtown Toronto. They take 40-degree water from the bottom of the lake that they would be taking for domestic consumption and we use the energy from that cold water to cool the building. We also use a district heating plan which is in the downtown core that feeds many high-rise buildings. So instead of having 40 boilers, there is one working efficiently that can be staged based on demand, which is more effective."

But Leslie's team didn't stop there—they kept looking for additional ways to reuse energy within the building. "We took it a step further because we heat the building through

"WE DEVELOPED THESE INITIATIVES AS A FULL-CIRCLE AND ALL-ENCOMPASSING PROGRAM, TOUCHING ALL DEPARTMENTS AND PROCESSES WHERE POSSIBLE. INCREASING RECYCLING WHILE LEAVING WASTE OIL TO BE DUMPED DIDN'T MAKE SENSE TO US, SO WE LOOKED AT INDIVIDUAL PLANS AND FACTORED IN HOW THEY AFFECT OTHER ASPECTS OF OPERATION, AND MADE SURE WE CONSIDERED ALL PROCESSES," says Bryan Leslie.

heat exchangers and direct steam. We have a condensate as a result of steam condensing and turning into hot water. We found that there was still energy in that hot water. We converted many of our hot water heating systems to use that condensate water to remove that last bit of energy to preheat our hot water tanks, therefore reducing utility further."

His team is continuously looking for more efficient ways to operate and reduce the environmental impact of their building, an effort that is keeping them on the leading edge of sustainability in their industry. For instance, another innovative project they took on was eliminating the chemicals used in their ice making. Leslie explains, "We had a system in the building that de-ionized the water to make the ice rink. It's a chemical additive to city water, used to purify it and make a clearer, harder, faster sheet of ice for our players—which is fairly typical. We looked at whether we were comfortable putting those chemicals in city water that ends up in the sanitary sewer, and ultimately decided we didn't like that method. So we converted our ice-making plant to a reverse-osmosis system that uses no chemical additives, and we use water-based paint on the ice. So now all of our ice is chemical-free when it goes back into the drain."

CHALLENGES: OVERCOME AND ONGOING

"The thing with an arena is that 'the show must go on' mentality is absolutely there," explains Leslie. "But within that mentality, there are a lot of opportunities, and we found a ton."

According to Leslie, many of these opportunities involved rethinking how the arena staff approached operations. "For example, it needs to be 60 degrees exactly before a hockey game. But do we need to open up all the valves 100 percent immediately at 3 a.m.? We found that wasn't the case. It's just because that is the typical way of doing it. We just relooked at the way we did things, and engaged our local utilities. We asked our engineers to not control valves from 0-100 percent on/off, but instead look at what our goal was. Just by changing some of the controls we saved about $60,000 and reduced utilities 6 percent in the first year, costing us nothing."

Meeting their waste diversion goal was one of the biggest challenges for Air Canada Centre, since there was no comprehensive recycling program in place at the arena. They tackled this by starting small and working with what was already available. "There was no program here at first, so literally taking a plastic cup out of the waste stream was one of our ideas. Looking at infrastructure happened at the very beginning. We knew we wanted to recycle but knew that we only had single-stream [recycling available]. So we looked at how we could use the infrastructure we had internally in the building to be able to divert our waste."

The arena started by investing in waste-sorting equipment and brainstorming with staff and suppliers about how to manage each part of their waste stream as efficiently as possible. "Not only did we buy tri-sorters, but we also developed an organics [management] plan to effectively collect organics out of the kitchens," Leslie explained. "We looked at how we could use our compactors more effectively, using a cardboard compactor to also take plastics. We negotiated with our suppliers to improve the way we do things and worked with good companies to develop a plan using what we had in place already, as well as to change what we had to so that everything worked in conjunction with the new plan."

Air Canada Centre has since reduced the amount of landfilled waste by 74 percent from their 2007 baseline. "That [reduction] is made up of two numbers," Leslie explains, "our monthly diversion of what we generate, which is around 55 to 60 percent, and also from reducing the amount of material coming into the building overall." Source reduction was a key factor in this initiative. "We found that through some practices we could reduce our landfill rate by not having some materials ever exist in the building to begin with." For example, the arena switched to using reusable pallets instead of cardboard boxes for shipping.

Another area the arena has worked on reducing is water consumption. They began with small retrofits such as faucet sensors and aerators. They also installed a high-efficiency flushometer system to reduce water use—though this didn't go exactly according to plan. "We originally increased our water consumption as a consequence of putting on that flushometer system," says Leslie. "We wondered why this was happening—when we thought we were doing a good thing. Well, it turns out that a lot of our fans don't use the manual flush on urinals—so when we installed the automatic flushometer our water use went up. We've minimized the water use as much as we can—and at the end of the day we can still justify the system because there's a cleanliness and health benefit and a maintenance factor in not having to replace piping often."

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Waterless fixtures are still on the horizon at the arena, Leslie says. "We did research into waterless urinals but we're not quite there yet. It's still on our radar but we have to make a judgment call. Last time we researched it there was a little trepidation in terms of aesthetics in the building and the operation but I'm sure it will be here soon."

LESSONS FROM THE FIELD

FORM A GREEN TEAM AND INVOLVE SENIOR MANAGEMENT: "One of the things I wanted to do with the Green Team is get people from all departments to have a solid cross-section of staff," says Leslie. "We engaged our senior management immediately, (1) because they had buy-in, and (2) because we needed their endorsement and input. We quite regularly present our plans and ideas to senior management to make sure that our direction is going the same way that's expected of us."

CREATE AN INTEGRATED SUSTAINABILITY PLAN FOR YOUR BUILDING: "We developed these initiatives as a full-circle and all-encompassing program, touching all departments and processes where possible. Increasing recycling while leaving waste oil to be dumped didn't make sense to us, so we looked at individual plans and factored in how they affect other aspects of operation, and made sure we considered all processes. Now all collected waste oil is converted into biodiesel, and we remove as much from the waste stream as possible, like fluorescent lights, batteries, toner, and all of the usual stuff. We also had the challenge of doing this on a 10+-year-old building, so we needed to rework older technology in a comprehensive way," Leslie explains. "This program has been so successful that we are now in the process of applying for LEED Existing Building (EB) status."

TRACK YOUR SAVINGS SO YOU CAN TOUT YOUR PROGRESS: Without good data it's difficult to accurately estimate your savings and publicize your progress. This is a challenge that Air Canada Centre faces, explains Leslie. "We do not have a record of our utility savings but I wish we did. This is our final year of our five-year plan and the one thing that is always a moving target is addition and subtraction of devices and utility consumption in the building. So while we've replaced all of our T12 and T8 lighting and done heating improvements, etc., the numbers are confusing." Systemized data collection of the building's consumption is key to quantifying these savings, and is a major goal for the arena in order to make sure their Team Up Green objectives are being met. "Our target this year is to invest our capital dollars into specific measurement," Leslie continues. "I want to stand up and say we absolutely hit our targets. The only way I can do that is to engage the company and place metering devices within the building to make sure I hit my mark."

ENGAGE YOUR FANS: Make sure your fans know what you're doing, and how they can get involved, Leslie stresses. "We put our messages on the boards and on displays. Most nights we profess what we're doing in-house. We've done PSAs with teams; we've done interviews on the radio. We've had our suppliers literally set up on the concourse as fans are walking by to show them what happens to the beer cups when they're done with them. We use television, newsprint—we get the message out in any fashion we can."

"THE THING WITH AN ARENA IS THAT 'THE SHOW MUST GO ON' MENTALITY IS ABSOLUTELY THERE. BUT WITHIN THAT MENTALITY, THERE ARE A LOT OF OPPORTUNITIES, AND WE FOUND A TON," says Bryan Leslie.

SHARE IDEAS WITH PEERS—JOIN THE GREEN SPORTS ALLIANCE: Sharing your successes and challenges with peers is crucial to creating widespread change, Leslie emphasizes. "With our green program, we don't like to keep all our ideas in-house. So when working with other groups we try to listen to them and then give back some of our good ideas to try and raise the bar everywhere. If we all raise the bar, we're all going to win. Through the Green Sports Alliance we've met so many contacts and gotten great information from them. All the ideas are good, even though they don't all work in all locations. We have discussions monthly with the NHL, and all of the arenas come to the table with their ideas. There are new ideas every month. Just last month I heard about electrically charged water that replaces a cleaner. Amazing stuff is coming out now and as much as I'm proud of what we've done, I see that there are so many new ideas out there. I'm learning every day just like everyone else."

ENDNOTES

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CASE STUDY

TOYOTA CENTER, HOME OF THE HOUSTON ROCKETS

ARENA STATS

Location: Houston, Texas

Began Construction: July 21, 2001

Opened: October 6, 2003

Seating Capacity: 18,400

Owner: Harris County—Houston Sports Authority

Operator: Clutch City Sports and Entertainment

Venue Uses: NBA games, AHL games, concerts, family shows, and conventions

Construction Cost: $255 million (in 2012 dollars)

LEED Certification: LEED Silver for Existing Buildings: Operations and Maintenance in January 2010

THE ROCKETS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Toyota Center and Houston Rockets had environmental responsibility on their radar even before the arena opened in 2003. "We started before we got into the building. We have always been very environmentally conscious at the Toyota Center—it's always been a part of how we operate," says Sarah Joseph, director of community relations at the Rockets.

The push towards operational efficiency and eventually pursuing LEED certification stems from their green-minded owner, Leslie Alexander. "Environmental responsibility is extremely important to Mr. Alexander," says Scott Manley, director of event operations at Toyota Center.[1] The Toyota Center was the fourth NBA arena to receive LEED certification, earning LEED Silver for Existing Buildings: Operations and Maintenance in 2010. "Applying for LEED was done on a voluntary basis, so we looked at that as an opportunity to take a leadership role," says Manley.

"TOYOTA CENTER HAS A UNIQUE OPPORTUNITY TO SERVE AS AN INDUSTRY LEADER IN THE FUTURE OF SUSTAINABILITY. WE ARE OPERATING IN A MORE ENVIRONMENTALLY CONSCIOUS MANNER AND EDUCATING THE MILLIONS OF PATRONS THAT ATTEND TOYOTA CENTER EVENTS EACH YEAR REGARDING WAYS THEY CAN HELP," says Rockets chief executive officer Tad Brown.

WHY GO GREEN?

By being environmentally responsible in their building and team operations, the Houston Rockets view their green program as a way to lead by example in the community. "Through our efforts with Green Games, aggressive recycling, public outreach initiatives featuring Rockets players, environmental support efforts, and many other programs, we are providing a significant educational support mechanism to our community and fans alike," says Rockets CEO Tad Brown.[2]

By showcasing environmental initiatives at the venue and team community events, the Toyota Center and the Rockets strive to engage their fans and their community in environmentally responsible behavioral changes. This strong commitment to environmentalism is reinforced by the venue's achievement of LEED certification in 2010. "In keeping with [owner] Leslie Alexander's vision of environmental responsibility, we have dedicated many resources over the past few years to gain certification within the LEED program with regards to sustainability and operational efficiency," Brown explains. "This certification serves as validation that our aggressive approach to energy management, recycling and waste reduction programs have made a difference here at Toyota Center and in our community."[3]

The Toyota Center was the first professional sports facility in Texas to get LEED certification in 2010, and, according to Greg Poole, director of facility operations, was among only two or three other buildings in Houston that were LEED-certified at that time.[4] As of 2012, there are now more than 100 LEED-certified buildings in the Houston area.[5]

WHERE TO START?

Though the Toyota Center has long been involved in environmental initiatives, "in 2008 we really made it more formal and started the LEED certification process," explains Joseph. "We launched initiatives on two separate fronts to ensure that environmental awareness was at the center of daily operational activities for Rockets and Toyota Center. First, we began the application process for Toyota Center to become a LEED-certified facility. Secondly, we also established a Rockets Green Committee to develop platforms for guiding our green programs that would be inclusive of staff, fans, and others in the Greater Houston Community."

"On the LEED certification side, Mr. Alexander, our CEO Tad Brown, our CFO Marcus Jolibois, our Assistant GM Scott Manley, and people on the facilities side were involved. Our Director of Facility Operations, Greg Poole, spearheaded our overall efforts to get the LEED certification," says Joseph.

For the Rockets, LEED certification started with collecting baseline data at the building. "When beginning the LEED process, it was important to undergo a comprehensive building survey to establish a baseline from which to expand," Joseph continues. "We partnered with a local engineering firm to assist with the LEED application process." Poole and Manley, along with an eight-person staff, centered the LEED process around five key areas: energy, air quality, water use, reduced chemicals use, and educational outreach.

Aiming for EnergyStar recognition guided the Rockets' energy efficiency initiatives. Poole and his team used EnergyStar Portfolio Manager to compare their building's energy use to similar buildings, which was helpful in gauging their building's energy intensity. "We were always really aggressive in trying to reduce our energy and our footprint," Poole said. "We wanted some validation of what we were doing."

However, this sort of energy comparison can be problematic, Poole notes, since as of yet EnergyStar does not include a sports venue category. "Currently EnergyStar does not have a specific rating or grouping for arenas and stadiums. Arenas attempting to get the points within LEED that are associated with EnergyStar have to submit any data they have, with regards to energy consumption, in hopes that EnergyStar qualifies us in some way."

Another focus area was water use at the arena. The team decided to pursue landscaping efficiency points, reducing their landscaping water use by 50 percent by using native and drought-tolerant plants and installing a drip irrigation system that waters plants at the roots and reduces evaporation. The arena also installed low-flow faucets, toilets, and urinals with automatic sensors that reduce water use by 30 percent compared to conventional building code.

The operations team also addressed air quality at the arena, exceeding American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) requirements.

STANDOUT GREENING ACCOMPLISHMENTS

ENERGY

Through numerous energy efficiency improvements, the arena has reduced overall electricity use by more than 27 percent since 2003, earning EnergyStar recognition. Initiatives include:

- ★ Engaging local entities in retro-commissioning practices
- ★ Installing a Building Automation System
- ★ Installing compact fluorescent light bulbs (CFLs) throughout the venue, saving $70,000 annually
- ★ Installing motion light sensors in offices
- ★ Purchasing renewable energy credits from energy provider

AIR QUALITY

- ★ Increasing indoor air quality exceeding ASHRAE standards, including entry mats that reduce particulates entering building, and MERV 14 air filters on air handlers that reduce energy use

WATER

- ★ Achieving a 50 percent reduction in landscaping water use by using native plants and installing a drip irrigation system
- ★ Installing low-flow faucets, toilets, and urinals, which reduce potable water consumption by 30 percent

REDUCED CHEMICALS USE

- ★ Reducing pesticide use by using Integrated Pest Management (IPM)
- ★ Introducing a high performance green cleaning program including Green Seal-certified products

ENVIRONMENTAL EDUCATION

Earned LEED Innovation points for education programs, including:

- ★ Green Committee projects
- ★ "Green" environmental awareness games
- ★ Community outreach efforts
- ★ Public outreach initiatives featuring the Rockets players
- ★ E-cycling events and tree planting events

ROCKETS GREEN COMMITTEE GOALS

- ★ Be a leader in the Houston community on environmental best practices.
- ★ Drive community activation on environmentally responsible behavior changes.
- ★ Increase community awareness of Rockets' environmental efforts.
- ★ Advance Toyota Center efforts towards LEED certification.

GREEN COMMITTEE ACCOMPLISHMENTS

- ★ Received the 2011 Mayor's Proud Partner Award for Green Initiatives
- ★ Changed behavior within office—lights off policy, recycling of paper and plastic items
- ★ Established the "Green Team of the Game Program"—for each game, youth from schools, non-profits, and sports teams volunteer to pick up recyclable items in the stands and throughout the arena; 400 youth participate each season
- ★ Receive ongoing coverage in local media for green initiatives

"We implemented an indoor air quality program that reduces particulates in the air by going above and beyond the recommended MERV 13 filters to MERV 14 filters used by our air handlers," says Poole. "This reduced particulates in the air as well as energy costs on the air handling units themselves by modifying the type of filter used." Entry mats that reduce particulates from people entering the building were also installed.

Another priority was reducing chemical use in the building. The arena achieved this by training staff in Integrated Pest Management techniques, which reduces the use of pesticides. The cleaning staff also began purchasing green cleaning products, including Green Seal-certified products.

The last focus area of the Toyota Center was creating an educational outreach program, which earned them Innovation points with LEED. This program meshed with the simultaneous efforts of the Rockets Green Committee, which was working to generate environmental awareness with fans, staff, and the local community.

"The Green Committee is made up of a cross section of folks from different departments from all levels of the organization—from coordinators to upper management," explains Ken Sheirr, senior director of marketing operations. "There were about ten people on that committee to help us establish the green policy and procedures that were eventually implemented,"

The Rockets Green Committee kicked off their program by engaging and educating their fans on environmental initiatives. "We were one of the first two NBA teams to have an environmental awareness game," says Sheirr. "We basically used that game as an opportunity to communicate our environmental views to our fans. We did things like having our mascot wear a green costume and including environmentally-friendly items such as recyclable cups and canvas bags as part of the night's giveaways. We brought in representatives who are involved in environmental issues throughout the community and let them use that as a platform to distribute their pamphlets or literature. We displayed environmental facts on the screen throughout the game. We've been doing all that for about four years. That was our first major initiative outside of the LEED process."

The next step was getting their staff involved in their program. The Rockets Green Committee instituted organization-wide initiatives to reduce environmental impacts around the facilities, starting with small changes. "We removed all paper cups from the coffee areas, encouraging everyone to use mugs," explains Sheirr.

"We installed automatic sensors that would turn off the lights in offices when people left the room. We sent out communications on the importance of electronics and powering down. We have big recycling stations with graphics set up throughout the administrative area where you can bring in your lightbulbs and batteries from home and we'll

"WE WERE ONE OF THE FIRST TWO NBA TEAMS TO HAVE AN ENVIRONMENTAL AWARENESS GAME," says Ken Sheirr, senior director of marketing operations. **"WE BASICALLY USED THAT GAME AS A PLATFORM TO COMMUNICATE OUR ENVIRONMENTAL VIEWS TO OUR FANS."**

recycle them for you. We've done that over the last few years and come up with a few new things to do each year, just to get folks engaged."

These initiatives have made a big difference at the arena, according to Poole. "We have increased our recycling tonnage from just a few tons each month to over 14 tons each month on average," he says. "We implemented a no trash can policy for individual spaces like offices and cubicles…[I]nstead we provided centralized waste stations that separated recyclable material from general waste. This created an opportunity for each person to have to get up and walk to the station and at that point it made them think about what they were discarding and not just throw everything into the general waste stream."

The Rockets also approached local organizations to assist in environmental educational outreach and green community events. "One of the main groups we've worked with is 'Keep Houston Beautiful,'" says Hai Duong, senior community relations coordinator. "They've been a wonderful and major resource in helping us find projects and locations. They've helped us find other partners as well such as the Houston Housing Authority or the Houston Arboretum and many other organizations as well."

This influence has not gone unnoticed; the Rockets won the 2011 Mayor's Proud Partner Award for their green outreach initiatives and community events. Initiatives included a "The Green Team of the Game Program" where youth from schools and social organizations volunteered to help pick up recyclable items during Rockets home games; 5,000 reusable water bottles given out at games; community cleanup events and tree planting events; and an annual "Recyclefest" event collecting electronics, books, clothing, and shoes for recycling and donation. In 2011, the event's organizers collected 14,242 pounds of electronics for responsible recycling; three blue crates, 150 bags, and 10 boxes of clothes and shoes, donated to the Salvation Army; and 12 boxes of books, also donated to the Salvation Army. The Rockets have collected nearly 100,000 pounds of electronics for recycling since launching the program.

CHALLENGES: THOSE OVERCOME AND ONGOING

Earning LEED's Energy points was no small task for the Houston-based arena, whose 750,000 square-foot building is a challenge to keep cool in the summer months, where temperatures hover in the mid-90s an average of 99 days per year. "To cool down the building for an event takes serious amounts of power," Poole says. The building hosted 150 events in 2009, so a high-efficiency cooling system was crucial in order to achieve the necessary energy reductions. When events are not scheduled at the arena, Poole's team makes sure to shut down as many building components as possible.[6]

"We have reduced our overall consumption by 27 percent from when we first opened and our annual goals are to continue finding ways to reduce electrical consumption by 3 percent to 5 percent each year," he says. "This was accomplished by lighting retrofits and equipment modifications, as well as creating the correct culture within our operations that designated energy management as one of the highest priorities in our daily business."

While pursuing LEED gave the Toyota Center a road map to environmental initiatives at the arena, the application process itself was a challenge. "The more [building features] you submit, the harder it is," Poole says. "We're not a typical office building. The information we're supplying is a little bit different from what they want to see. We have to make arguments back and forth for why we feel like we're matching what they're asking for." The Rockets ended up bringing on a consultant from Riehl Engineering to provide day-to-day support for the complicated application process.

Despite these challenges, the Toyota Center is determined to build on its LEED Silver certification and strive for higher certification levels. "We intend to continue improving on our current list of programs and implementing new ones with the eventual goal of reaching the next level of certification," says Joseph.

LESSONS FROM THE FIELD

ESTABLISH A GREEN COMMITTEE AND SET GOALS: The Rockets established a Green Team with representation across the organization. Goals and objectives were determined during initial Green Team meetings, which led to developing a comprehensive environmental program. According to their USGBC project profile, "Seemingly the most important item the project team identified for the success of this project is the necessary cultural shift which must occur with both event attendees and concessions to make LEED certification a reality."[7]

ENGAGE YOUR COMMUNITY IN YOUR ENVIRONMENTAL EFFORTS: With more than 1.5 million fans visiting the arena annually, the Toyota Center has a considerable influence in the community. "Toyota Center has a unique opportunity to serve as an industry leader in the future of sustainability," says Brown. "We are operating in a more environmentally conscious manner and educating the millions of patrons that attend Toyota Center events each year regarding ways they can help." Events that address local environmental issues are a great way to engage the community and educate fans about the environment. "For us, one of the major initiatives from a community standpoint is tree planting, especially now in Houston coming out of a terrible drought over the last summer that led into January of 2011. There was so much damage done to the green space in Houston and the landscape. What we really want to do is figure out a way to get involved in that, whether it's just going out organizing tree-plantings or figuring out a way to raise money," says Joseph.

ENDNOTES

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CASE STUDY

PHILIPS ARENA, HOME OF THE ATLANTA HAWKS

ARENA STATS

Location: Atlanta, Georgia

Began Construction: June 5, 1997

Opened: September 18, 1999

Seating Capacity: 18,729 (basketball) and 21,000 (concerts)

Owner: Atlanta-Fulton County Recreation Authority

Operator: Atlanta Spirit, LLC

Venue Uses: NBA/WNBA pro and collegiate basketball games, WWE wrestling matches, family shows, and a variety of concerts

Construction Cost: $298 million (in 2012 dollars)

LEED Certification: Certified LEED for Existing Buildings: Operations and Maintenance in April 2009

THE HAWKS' GREENING STORY: MOTIVATIONS, CHALLENGES AND LESSONS FROM THE FIELD

The Atlanta Hawks have a competitive green streak that came out when they vied with the Miami HEAT to become the first NBA team with a LEED-certified home arena. For eight months, the Hawks worked hard to achieve LEED Certification for Existing Buildings: Operations and Maintenance (EBOM), and the team was awarded the LEED certification on April 7, 2009, becoming the first NBA arena in the world to achieve this certification for an existing facility. Today, many NBA arenas have achieved LEED certification including the Miami HEAT, the Orlando Magic, Houston Rockets, and Portland Trail Blazers.

To earn certification the arena invested in a variety of green improvements almost a decade after the building first opened. These upgrades included: HVAC, chiller, and lighting retrofits; reflective roof materials that reduce cooling needs; and water conservation measures such as low-flow bathroom fixtures that have cut water usage by 2 million gallons.

WHY GO GREEN?

"The building was built with sustainable thoughts in mind as we've always been interested in the environment and our effect," says Barry Henson, vice president of operations. However, Henson explains that as new technologies and building standards were being developed, the Hawks became increasingly interested in how they could further improve. "When we started talking about really getting involved and moving our position forward on greening our arena ownership, executives and marketing group were asking us what we could do better," says Henson, "and that got us thinking about the next level of efficiency and improved operations."

For the Hawks, greening was kicked off by two interests: maximizing operations efficiency, and competitiveness. The LEED green building certification intrigued the Hawks, particularly as it appealed to their desire to be the first arena to achieve LEED certification. "We spoke to other arenas but found no others going with LEED. LEED has gone through so many innovations and there are a lot of things that better fit an office building or school than a 24-hour operating arena like ours," says Henson. "When we decided to pursue LEED certification it helped us blaze a few trails for the U.S. Green Building Council."

WHERE TO START?

The Hawks operations team began by weighing the pros and cons of different greening initiatives and programs to assess which most fulfilled their primary objective of high operational efficiency. "We started by looking into areas such as carbon credits and buying renewable energy credits (RECs), but those are areas that people get involved in that don't really change their operations or policies," says Henson. "LEED was the only answer for us because it gave us the ability to document our policies, make changes where we needed to, and engage ourselves in the entire greening process."

The Hawks brought together a core group of interested staff members from operations, event planning, and marketing to work with a local green building consultant called Southface. This green team led the charge on greening and LEED process, explains Henson, which ultimately also relied on feedback and buy-in from all staff. "Every employee in the arena had a role in changing how we do things, in assembling information and also in researching other greening initiatives out there. It was a total team effort here," Henson emphasizes.

STANDOUT GREENING ACCOMPLISHMENTS

- ★ Low-flow flush toilets, aerator changes and low-flow shower heads as well as management of the cooling system reduced water consumption to save more than 1.95 million gallons of water per year.
- ★ Philips Arena electrical consumption has seen an 8 percent reduction year over year, saving more than 4.5 million kilowatt-hours per year. Philips Arena uses approximately 20 percent less energy than all other U.S. arenas that house two professional sports teams (Philips hosts both the Hawks and WNBA's Atlanta Dream).
- ★ Philips Arena sends its plastic, aluminum, glass, cardboard and paper waste to SP Recycling.
- ★ Philips Arena sends over 12 tons of food waste per year to be turned into compost that is sold and used locally.
- ★ Paper products, including paper towels, bathroom tissue, and copier paper, are all 100 percent post-consumer recycled content.

The Hawks began their on-the-ground work by implementing more environmentally conscious cleaning practices. "The first big change we made was moving towards green cleaning. That was a big change because everyone was used to using bleach, ammonia, and other chemicals," says Henson. "We had training and staff integration in order for our green cleaning staff to get everyone on board. The chemical supplier that we started working with, Southeast Link, has what they call a 'Green University.' So they'll bring a gentleman out who trains our staff as often as we need to make sure that everyone understands the proper operation of the greener equipment and products. They do training both onsite and at their headquarters."

CHALLENGES: THOSE OVERCOME AND ONGOING

The Hawks looked to their peers for greening inspiration. When they were unable to find any LEED-certified arenas to use as a model, Henson's team worked on identifying individual greening projects that the Hawks could take on. "We just wanted to find out the greening initiatives at the other arenas. For example, composting was an initiative we pulled in from another arena," explains Henson.

The Hawks also turned to both publically available resources and a local consultant for advice on which green products to use and how to upgrade their systems. "We have worked with the EPA on some of our initiatives and have used their online resources for guidance," says Henson. "We also worked with Southface on the LEED process, which was a big help to us. We went through some training at their headquarters on certifying buildings and green projects. They helped provide us with a lot of information on how to pursue LEED certification and we took a lot of cues from them from an operational standpoint."

The Hawks had some challenges finding enough space to sort and manage their recyclables onsite, as well as initial local hauling issues. "From a waste diversion standpoint, we are on such a small footprint here that we had to get creative about how to handle those recycled materials and find a company that would accept our recyclables," says Henson. "But we overcame those issues and increased our diversion rate from 5 percent to about 20 percent, if you include the compost diversion. That takes a lot of weight out of our compactors and really reduces our waste bill as well. It's good to be able to divert something and get it to a location where it can be reused."

On the composting side, the Hawks had to work out how to best keep their composting facilities clean and sanitary for employees to manage. "Our composting program is active throughout our back of house. We started doing only the kitchens and food areas but we then expanded into all of our 90+ suites," describes Henson. "These programs require a lot of meetings and a long refining process. We bought some equipment for cleaning the food receptacles. You have to clean those out daily. We've worked through those pains and now it's a pretty seamless process."

Since 2008 the Hawks have also been implementing green strategies to increase their energy savings. "We've been working on our power consumption for several years now," says Henson. "In 2008 we reduced our energy consumption enough to power 1,300 average American homes for a month."

The Hawks' system-wide approach to energy reduction focuses predominantly on commissioning, automated lighting, lighting upgrades and sensors, according to Henson. "Our energy savings are mainly attributable to building commissioning, with new checks and balances of our systems," he explains. "We had our airflow tested to ensure the systems were performing as designed and cut back use where possible. We looked at reducing lighting needs, have done some retrofits and also put some things on an automatic shut down. We put light sensors in offices. We were able to reduce the wattage of the fluorescent lamps from 34 watts to 25, with the same light effect throughout the facility."

Henson's team compared Philips Arena with similar venues nationwide to best evaluate their overall energy savings. "When we were moving through the LEED certification process, we were able to benchmark ourselves against other arenas," Henson explains. "We approached arenas that have a similar climate and events schedule. We tracked 21 percent better than any other building that we talked to in the country in terms of energy use. Additionally, our concert attendance is ranked third in the nation, which makes our energy savings metrics even more impressive."

"WHEN WE WERE MOVING THROUGH THE LEED CERTIFICATION PROCESS, WE WERE ABLE TO BENCHMARK OURSELVES AGAINST OTHER ARENAS," Barry Henson explains. **"WE APPROACHED ARENAS THAT HAVE A SIMILAR CLIMATE AND EVENTS SCHEDULE. WE TRACKED 21 PERCENT BETTER THAN ANY OTHER BUILDING THAT WE TALKED TO IN THE COUNTRY IN TERMS OF ENERGY USE. ADDITIONALLY, OUR CONCERT ATTENDANCE IS RANKED THIRD IN THE NATION, WHICH MAKES OUR ENERGY SAVINGS METRICS EVEN MORE IMPRESSIVE."**

On the other hand, the Hawks recognize that there is always room for improvement and meet regularly to plan their next projects. "We still have meetings to look at new products and procedures," says Henson. "The thing about LEED is that once you get certified everybody calls you with new products which we evaluate based on payback and efficiency. We separate out the projects we want to entertain for future capital expenditure as well as the cost-neutral things that we can change now."

In order to evaluate new products, the Hawks conduct internal research and also solicit advice from partners. "We'll look through new products to determine if they're legit. We talk to the typical user of a product to get their evaluation of it," says Henson. "I also call Southface often and ask them if they've heard of the product or seen it in action anywhere, because they are a great resource for us. We get to the right people to make our decisions and count heavily on the partners who are closest to us in the process."

Up next for the Hawks: a rainwater cistern and 100 percent chemical-free cleaning. "We are working on a couple of water-saving initiatives wherein we collect rainwater, as well as condensation, from our building and use that in our cooling towers instead of using city water. That's one piece that we are actively working on, but it's still in its infancy right now," described Henson. "There are some alternate cleaning initiatives that are looking very enticing as well, which would keep us from using any chemicals whatsoever. We've found a company that makes a product that is both a sanitizer and cleaning agent. You can use it in any spray bottle or cleaning infrastructure that you already have and it eliminates the need for cleaning chemicals of any kind."

LESSONS FROM THE FIELD

PARTNER WITH SPONSORS ON GREEN INITIATIVES: The Hawks have harnessed the green initiatives of numerous local companies in order to enhance and grow existing corporate partnerships and fashion a large percentage of their own employee volunteer projects on community donation drives and reforestation projects.

PARTNER WITH LOCAL ORGANIZATIONS TO GROW YOUR COMMUNITY CONNECTIONS: "We've formed a tight relationship with Habitat for Humanity and with the Atlanta Mission. A lot of the things that we no longer use here are reusable so we try to donate to those two entities as much as possible because it helps take care of Atlanta locally," says Henson. "It has been a benefit for us to get involved in nonprofit groups that are taking care of our local people, often also our fans." The Hawks also participate in Rock and Wrap it Up!, a widely used food donation program. "The group comes and picks up the prepared leftover food; we only have to collect it and get it to a central location," explains Henson. "We try to help as much as we can locally. Many of these issues, environmental and social, should carry over into peoples' home lives. We try to help educate fans, friends and other family members."

PROVIDE DIRECT INCENTIVES TO ENGAGE STAFF IN GREEN ACTIONS: "We are connected to a MARTA [Metropolitan Atlanta Rapid Transit Authority] rail station so we regularly encourage our workers to ride the train. We give them train and bus passes as a perk to encourage them not to drive," explains Henson. "Access to mass transit is a big help as we were able to cut down on our amount of parking as part of our LEED certification."

REPEAT TRAININGS TO EDUCATE BOTH PERMANENT AND TRANSIENT STAFF: "Our type of training programs are really about re-introducing the same idea over and over until our staff takes hold of it. Once they do then they start introducing it to other people," says Henson. "We have so many third-party people working in our building at all times, which can make it difficult to educate everyone. But because the part-time employees are in constant contact with members of our staff, our messages get to those people as well."

SNAPSHOTS

The sports greening movement is so widespread that it's impossible to feature all of the impressive accomplishments, even just at the professional level, that are leading the industry in environmental stewardship. Below are a few snapshots of noteworthy professional greening successes that help demonstrate the reach of this trend.

NATIONALS PARK, HOME OF THE WASHINGTON NATIONALS

First North American Professional Sports Venue to Be Awarded LEED Certification (Silver), and First to Install a Green Roof

Nationals Park in Washington, D.C., was awarded LEED certification (Silver) by the U.S. Green Building Council on April 14, 2008.[1] The stadium was the first major sports facility in North America to pursue and achieve LEED certification for New Construction, and it was able to do so while meeting its target schedule and budget. "In the end, we were able to create a ballpark that not only preserves our precious environment, but also preserves the history and traditions of baseball in the nation's capital," said Stan Kasten, then president of the Washington Nationals, when announcing the accomplishment. "The whole design team went above and beyond the call by achieving LEED Silver Certification—it's like we asked them for a home run and we got a grand slam."[2] Noteworthy green building features include a 6,300-square-foot green roof, stadium construction using 95 percent recycled steel from a regional plant, and energy-conserving light fixtures that have reduced energy consumption by 21 percent.

The Nationals also have a single-stream recycling program that diverts about 80 percent of the stadium's waste from landfills. Nationals Park has water-conserving plumbing fixtures that save approximately 3.6 million gallons of water each year. The park also has an intricate water filtration system that separates water used for cleaning the ballpark from rainwater, treating each source individually to reduce the amount of total processing. In addition, the park's location makes it easily accessible by public transportation, and the parking lot has more than 250 bicycle racks.[3] The Nationals are now working on replacing all fluorescent lighting for stadium walkways with LED lighting. They are also investigating onsite wind turbines and solar canopies and the possibility of a new green roof.

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POCONO RACEWAY, HOME OF NASCAR

Largest Solar Array at Any Sports Facility in the World

In August 2010, NASCAR's Pocono Raceway in Long Pond, Pennsylvania, became the largest solar-powered sports facility in the world. Pocono installed a 25-acre, 3-megawatt array in a former parking lot adjacent to the track. It consists of 40,000 American-made photovoltaic modules and is large enough to be seen from outer space. The solar array, which offsets more than 3,100 metric tons of CO_2 annually, provides enough power to operate the entire raceway and 1,000 homes nearby (the raceway sells the energy it doesn't use to local utilities).[4] Members of the NASCAR community realize that this is an important milestone for the sport. "Pocono Raceway strongly believes in the commitment to operate in a more environmentally responsible way and is proud to be the first racetrack to power our sport with clean, renewable sunlight with the world's largest renewable energy project to power a sports facility," said Brandon Igdalsky, president and CEO of Pocono Raceway. "This solar power system, built with timber, steel and solar panels made in the U.S., satisfies all of the raceway's energy needs while helping to power local homes. This project demonstrates real sustainability and proves that any business that truly wants to go green can do it."[5]

Other tracks around the country have followed suit, such as the Infineon Raceway in Northern California.[6] In the summer of 2011, Infineon installed 1,652 solar panels, which supply 41 percent of the raceway's energy. The raceway also installed a low-energy video board using 57,600 LEDs, which consumes 50 percent of the energy that the old board required.

O.CO COLISEUM, HOME OF THE OAKLAND ATHLETICS AND RAIDERS

First Major League Sports Venue to Implement a Facility-Wide Composting Program

O.co Coliseum (the former McAfee Coliseum) became the first major league sports venue to implement a composting program and use compostable cups in May 2005. The Coliseum's extensive waste diversion program, with many recycling and compost receptacles placed throughout the stadium, has decreased its trash-hauling costs by more than 20 percent. "The economics have caught up with the vision: the coliseum is saving a significant amount of money by composting and recycling,"[7] said George Valerga, the venue's director of maintenance. "It took about eight months to a year to get down to where it now costs the same in labor. And we're saving $10,000 to $20,000 a month on our garbage bill."[8]

While bottles, cans and paper discards go into recycling bins, almost all other products are composted. Cups, food waste, grass clippings, landscape trimmings, and other organic waste are collected and sent to a composting site managed by Norcal Waste Systems.[9] The O.co Coliseum diverts about 400 tons of recyclables and composts 200 tons of organic wastes annually. Each year its environmentally preferable purchasing program prevents the use of three tons of fossil fuel-derived plastic cups.[10] The stadium's concessionaire, ARAMARK, donates all unused prepared food to local food banks as well.

The Oakland Athletics reach out to fans to be part of their game-day recycling and composting programs, among their other green initiatives, by providing well-marked receptacles throughout the stadium every game. In 2009 the team also started a weekly electronic waste drive called "Oakland A's E-Waste Saturday," presented by the recycling company AER Worldwide, where fans can drop off electronic items during the two and a half hours leading up to the first pitch of the Saturday ballgame. Fans who recycle an electronic item receive a two-for-one Oakland A's ticket voucher for an upcoming game.[11]

SHOWARE CENTER, HOME OF THE SEATTLE THUNDERBIRDS

First LEED Gold-Certified Facility for New Construction in North America

On January 2, 2009, ShoWare Center in Kent, Washington, home to the Seattle Thunderbirds of the junior Western Hockey League, became the first arena in North America to be certified LEED Gold for New Construction.[12] Designers implemented several unusual green features, such as the use of excess heat from the ice-making equipment to heat the ground under the ice rink.[13] "I'm extremely proud of this achievement," said Kent Mayor, Suzette Cooke, at the award announcement. "Receiving LEED Gold certification reaffirms our efforts to balance economic development with being good stewards of the environment. It's also pretty cool to be the first LEED Gold-Certified new arena on the continent!"[14]

LEED-qualifying features include a stormwater collection system that sends runoff to adjacent wetlands, storage for bikes, use of low-VOC paints and adhesives, use of green cleaning products, and low-flow fixtures that reduce water consumption by 40 percent to save 380,000 gallons annually.[15] The ShoWare Center's energy-efficient lighting and upgraded HVAC systems reduce energy use and CO_2 emissions by more than 37 percent. Its urban location maximizes opportunities for fans to use public transportation, lowering total greenhouse gas emissions and other harmful air pollutants. During construction, most building materials were locally manufactured, 50 percent of wood used was certified by the Forest Stewardship Council, and more than 90 percent of construction waste was recycled.

HOME DEPOT CENTER, HOME OF THE L.A. GALAXY

First Outdoor Stadium to Be Awarded ISO 14001 Certification in North America

The Home Depot Center, home of the L.A. Galaxy pro soccer team, became the first outdoor stadium in North America to be awarded ISO 14001 certification for its environmental management system in November 2011.[16] "The ISO certification adds structure and transparency to our environmental stewardship commitments by putting all our ideas, programs and best practices on paper," said Katie Pandolfo, general manager of the Home Depot Center. "By having all of our goals and initiatives tracked in one place, the ISO keeps everyone on the same page and holds each of our divisions and employees accountable."[17] The Home Depot Center's energy-saving features include motion sensors connected to the HVAC and lighting systems so these systems are active in a given space only when that space is occupied.[18] To further enhance energy efficiency, the stadium also participates in Southern California Edison's Demand Response programs, which enable it to manage energy use to avoid statewide demand peaks. "One of the things we take pride in across our venues like the Home Depot Center is that sustainability isn't just a buzzword, but part of our smart business operations," said Jennifer Regan, global sustainability director at AEG, which owns the facility. "By cutting back our energy and water use, our participating venues not only reduce their environmental footprint, but also cut their operational costs, which has a direct impact on our bottom line."[19]

The L.A. Galaxy demonstrates its commitment to spreading environmental awareness in the greater Los Angeles community by participating in the Greener Goals Week campaign. As the MLS Cup Champion in 2011, the Galaxy participated in the Bonneville Environmental Foundation's Solar 4R Schools program, which installs solar panels on a school in the winning team's region. This year's 2.1-kilowatt solar array was awarded to KIPP Los Angeles College Preparatory School, located in East L.A. The panels are anticipated to produce 3,034 kilowatt-hours of clean energy per year. Solar 4R Schools also provides students and teachers with hands-on tools to help them learn about the importance of solar, wind and other renewable energy technologies. The kickoff event also included a garden planting project with Galaxy players helping to plant fruit, vegetables, and herbs in the school garden.[20]

FENWAY PARK, HOME OF THE BOSTON RED SOX

Oldest Major League Baseball Stadium Undergoes Facility-Wide Sustainability Upgrade

Built in 1911, Fenway Park is the oldest Major League Baseball stadium currently in use. Despite the venue's age, the Boston Red Sox have undertaken a variety of green initiatives to improve the operations and efficiency of their historic venue. "As stewards of such a storied venue, we recognize our unique position and ability to raise public consciousness about important issues. Our decision to enhance the ballpark's environmental attributes is one born out of a sense of personal responsibility and professional duty," said Tom Werner, the team's chairman, in 2008 during the launch of the Fenway Greening program, which was initiated in partnership with NRDC. "For us, this announcement marks some of the first steps in an ongoing process to make America's most beloved and oldest ballpark also one of America's greenest."[21]

In 2010, Fenway completed an energy audit to investigate ways to reduce energy use and save money. The park now uses LED lighting, which is 90 percent more efficient than the previous lighting. The ballpark also installed 28 solar panels across the roof of the Red Sox dugout. The array supplies 37 percent of the energy needed to heat Fenway's water, thereby avoiding the release of 18 tons of CO_2 each year, the equivalent of planting 4.86 acres of trees.[22] The stadium has also implemented many plumbing renovations, including the installation of waterless urinals, dual flushers, and water-efficient fixtures. Together, these have reduced overall water consumption by 30 percent, saving more than 360,000 gallons each year.[23] All building renovations use locally sourced materials, and new construction has reused more than 800 tons of old bricks and recycled other construction waste. Fenway also plans to install sensor-controlled fluorescent lighting.[24]

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Fenway also has a Going Green recycling program, which involves a game-day green team of volunteers collecting recyclables and 100 solar-powered BigBelly compactors located around the park, each one able to hold 55 gallons of recyclables. Fenway uses 100 percent recycled content paper for most paper products, including *Red Sox Magazine*, in offices as well as the ballpark. Their concessionaire, ARAMARK, is committed to offering more local, organic food options and using cups, containers and napkins made from recycled content.[25] "With the help of our dedicated staff and valued sponsors, we are continuing our commitment to make Fenway Park friendlier to the environment," said Werner. "We hope that by incorporating both big and small changes in our daily operation, the cumulative effect will mean future generations can enjoy the great game of baseball in a cleaner and more environmentally friendly world."[26]

TARGET CENTER, HOME OF THE MINNESOTA TIMBERWOLVES

First Professional Sports Arena in North America to Install a Green Roof

In September 2009, the Minnesota Timberwolves installed the first green roof on any North American arena, spanning 2.5 acres (115,000 square feet) across the Target Center in Minneapolis.[27] Currently, this is the nation's fifth-largest green roof on any facility. The roof captures nearly 1 million gallons of stormwater a year, which saves $10,000 annually in stormwater charges and prevents runoff into the Mississippi River. In addition, the green roof helps alleviate the urban heat island effect. The roof is planted with a variety of native Minnesotan prairie plants, including lupines, to support the endangered Karner blue butterfly.[28] "The city wanted to make a sustainable choice with this roof," said Tom Reller, senior director of operations for the Target Center.[29]

The Timberwolves have pursued other sustainability initiatives as well, including switching to using a plane for team travel that is 30 percent more energy-efficient than the type previously used; the plane also has an onboard recycling program.[30] The Timberwolves also partner with Juhl Wind, Inc., a wind power developer, to take part in Think Green month, which encourages fans to implement a more eco-friendly lifestyle.[31] At each home game during the month, the Timberwolves honor organizations or individuals helping to preserve the environment and air an in-game public service announcement that promotes the importance of greening. "We are very excited to be part of this interactive and informative program," said Corey Juhl, vice president of project development at Juhl Wind. "We enjoy working with the Timberwolves organization to spread the word and provide education to the community on how each of us can contribute to the preservation of our environment."[32]

CONSOL ENERGY CENTER, HOME OF THE PITTSBURGH PENGUINS

First National Hockey League Arena Awarded LEED Gold Certification in North America

The Pittsburgh Penguins' Consol Energy Center, built in 2010, was the first NHL arena to be awarded LEED Gold certification on August 4, 2010.[33] The project received high marks for water use reduction, recycled materials, regional materials, demolition and construction waste diversion, use of certified wood, and energy efficiency. LEED-qualifying features include increased green space around the outside of the building, locally procured construction materials, improved indoor air quality, efficient lighting and HVAC, maximized use of natural light, use of low-VOC paints and adhesives, purchase of renewable energy for a portion of energy use, and water-efficient plumbing fixtures. "The sustainable building practices that helped the center to achieve LEED Gold certification truly make this facility a world-class arena for Pittsburgh's world-class hockey fans and set a great example for future facilities of this type," said Edward G. Rendell, governor of Pennsylvania at the time.[34]

The Penguins are also committed to supporting the local community. The stadium's concessionaire, ARAMARK, has a menu that emphasizes locally grown ingredients. The Penguins participate in the Rock and Wrap It Up! program, donating unused concession food on game nights to local food banks. With 20,057 pounds of food donated in 2011, the Penguins ranked first among the 24 U.S.-based NHL teams participating in the program that year. "We thank our partners at ARAMARK for their commitment to this very important community program," said David Morehouse, CEO and president of the Penguins. "Food that otherwise would have gone to waste is now being turned into thousands of meals for the Greater Pittsburgh Community Food Bank to provide to those in need. We're proud to be a part of it."[35]

CITIZENS BANK PARK, HOME OF THE PHILADELPHIA PHILLIES

Greatest Purchaser of Green Power in U.S. Professional Sports

In 2008, the Phillies became the first Major League Baseball team to join the EPA's Green Power Partnership program, which encourages organizations to buy certified renewable energy. In June 2012 the Phillies purchased more than 22 million kilowatt-hours of Green-e certified renewable energy in renewable energy certificates (RECs) to offset 100 percent of Citizens Bank Park's electricity use with local clean energy. According to the EPA, this is the largest single purchase of renewable energy to date in professional sports.[36] The annual environmental benefit of this purchase is equivalent to planting 285,000 trees and growing them for a decade. By electing to purchase locally sourced wind- and solar-generated power, the Phillies are also investing in regional clean energy jobs.[37] "We're proud to join Major League Baseball in bringing awareness to fans about how to become more environmentally conscious," said Phillies president, David Montgomery.[38]

As part of their Red Goes Green campaign, the Phillies and Citizens Bank Park also have a strong recycling program. Throughout the ballpark are 40 oversize, 80-gallon recycling containers that accept cardboard, paper, e-waste, plastic, aluminum, and glass. A Red Goes Green Team, consisting of Phillies ball girls and volunteers, collect recyclables during games to boost the diversion rate. The venue has a recycling center for all departments, enhancing back-of-house recycling efforts. In a 2010 carpet replacement project, the Phillies recycled 1,755 pounds of carpet, which is equivalent to the waste generated by one American in a year. The Phillies also participate in the Rock and Wrap It Up! food donation program, giving unsold prepared food to local charities.

CITI FIELD, HOME OF THE NEW YORK METS

Leader in Use of Recycled Materials for Reconstruction

The New York Mets focused on sustainability when constructing their stadium, Citi Field, which opened in 2009. Among other initiatives, the Mets used 95 percent recycled steel—approximately 11,875 tons. "In developing and constructing Citi Field, we set out to create a world-class environment that would be fan-friendly and environmentally friendly," said Jeff Wilpon, chief operating officer for the Mets.[39] The most notable installation was a 15,000-square-foot green roof, which reduces energy demand by acting as extra insulation, retaining cool air in the summer and heat in the winter. It is one of only three green roofs installed on professional sports facilities in the country. The green roof also reduces water consumption and diverts approximately 80 percent of stormwater runoff.

The ballpark is also equipped with a temperature-control system that reduces energy consumption by up to 50 percent using energy-efficient air handlers, pumps and chillers that adapt their operation to current conditions.[40] Inside the stadium, waterless urinals and automatic low-flow toilets and faucets save about 4 million gallons of water a year.[41] The Mets are also members of the EPA's EnergyStar and WasteWise programs. "The Mets understand that their responsibility to New Yorkers doesn't end with the third out in the bottom of the ninth," said New York's mayor, Michael Bloomberg. "They've taken the initiative to be bold, innovative and environmentally responsible."[42]

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LATEST GREEN BUILDING LEADERS IN PROFESSIONAL SPORTS

When designing or renovating their facilities, increasing numbers of sports venues are turning to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification as a guide to help them improve their environmental performance and, concurrently, boost their bottom line. As of this printing, 15 major professional sports venues in the United States and Canada have received LEED certification for Existing Buildings or New Construction standards. Several others are currently pursuing certification.

The LEED building rating system is an internationally recognized standard for sustainable building design. The standards, which cater to a variety of building projects and types, incorporate a range of environmental and public health considerations, including energy efficiency, building site selection, indoor air quality, and water use. Materials and resources used to construct buildings and keep them running smoothly and comfortably all have environmental impacts. Green buildings and operations are designed to minimize these impacts by using environmentally preferable construction materials and techniques, including reducing water and energy use, minimizing waste, and making better use of natural features like shade, daylight, and rainwater. By streamlining and improving design and construction, green buildings reduce their contribution to biodiversity loss, global warming, and many other environmental pressures.

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As demonstrated in many of the case studies and snapshot features in this report, many facilities across the sports industry already incorporate green building strategies that deliver strong financial paybacks and provide new ways to boost their venue's visibility. Each year, more and more sports industry building owners and developers are following suit by deciding to build green, whether they choose to pursue one of the LEED certifications, ISO 14001 for green operations or another standard. Industry-wide, sport professionals are increasingly drawn to green building practices because these practices make good financial sense, in addition to promoting brand enhancement, employee health and community welfare. The following venues are some of the most recent to either be awarded LEED certification or to announce that they are pursuing LEED certification.

JELD-WEN FIELD, HOME OF THE PORTLAND TIMBERS

LEED Silver-Certified for Existing Buildings, September 1, 2011 and Oldest Stadium to Become LEED-Certified

Jeld-Wen Field, home of the Portland Timbers Major League Soccer club, was awarded LEED Silver Certification for Existing Buildings on September 1, 2011.[1] The 86-year-old facility underwent extensive renovation to improve the efficiency and sustainability of its original 1926 design. "The challenge we face is taking an 85-year-old facility and transforming it into a leading example of efficient use of resources," says Ken Puckett, senior vice president of operations at Jeld-Wen Field. "We are proud to have achieved LEED Silver certification, and we will continue to identify ways to increase efficiency in all areas of our operations and make an even greater impact."[2]

The facility committed $40 million to undertake the major restoration, and worked for more than a year with Green Building Services of Portland and the nonprofit Energy Trust of Oregon to achieve LEED certification.

As part of their upgrade, the operations team implemented more energy-efficient mechanical systems and sports lighting to improve electrical efficiency by more than 40 percent.[3] The team also installed low-flush fixtures to reduce water use and implemented a recycling program that now diverts 20 percent of all waste.[4] The field has initiated composting in all kitchens and will soon be distributing compost receptacles for fan use around the facility. "We are working to improve that [waste diversion] percentage by increasing recycling, composting, and other waste reducing habits in and around the stadium," says Puckett.[5]

The Timbers are also part of several local programs that encourage sustainability among fans and in the surrounding community. For example, they now partner with *TriMet*, a public transportation system, to make subway passes more widely available to ticket holders. The field has about 100 permanent bike racks and more than 250 temporary game-day racks, and approximately 350 people cycle to each Timbers game.[6]

MILLER PARK, HOME OF THE MILWAUKEE BREWERS

LEED-Certified for Existing Buildings, March 26, 2012 and First LEED-Certified Stadium with a Retractable Roof

Home of the Milwaukee Brewers since 2001, Miller Park achieved LEED Certification for Existing Buildings on March 26, 2012.[7] This is the first ballpark with a retractable roof to achieve LEED certification. Miller Park's retractable roof made meeting the LEED energy and ventilation thresholds more difficult. "We are thrilled with the news of the LEED certification and want to thank all of our partners who were involved in the process," says Milwaukee Brewers executive vice president of finance and administration, Bob Quinn. "It is a challenge to achieve the designation in an existing building of this size and type, but we have all been focused on the end goal. Earning this designation means that we have significantly improved our sustainability and energy efficiency, and the benefits extend to the organization, our fans, partners and the environment."[8]

To improve energy efficiency, the Brewers implemented a retro-commissioning project, which analyzed HVAC, plumbing, electrical lighting and power. As a result, they reduced scoreboard energy output by 49 percent and eliminated 1,153 tons of CO_2 emissions annually. A retrofit to water fixtures saves the stadium three million gallons of water annually. In terms of waste, Miller Park has an extensive recycling program—more than 140 recycling containers dot the facility, fostering a 35 percent diversion rate. On average, the park recycles ten tons of discards from each game and donates over 7,000 pounds of unused prepared food to local food banks each season as part of the Rock and Wrap it Up! program.[9] "While we are honored to have achieved this designation, our commitment will continue in 2012 and beyond," says Brewers chief operating officer, Rick Schlesinger. "We are committed to improving our efficiencies and programs and will look to keep Miller Park as an industry leader in these efforts."[10]

MARLINS PARK, HOME OF THE FLORIDA MARLINS

LEED Gold-Certified for New Construction, May 24, 2012 and First MLB LEED Gold New Ballpark

On May 24, 2012, after four years of construction, Marlins Park became the first ballpark in Major League Baseball to be awarded LEED Gold Certification for New Construction.[11] "It was our desire from the outset to not only build America's greatest new ballpark," says Jeffrey Loria, owner of the Marlins, "but also its most environmentally friendly."[12] The Marlins chose to locate their new facility on the former Orange Bowl site, a location with numerous public transportation options, including seven bus lines and nearby train and trolley stations.[13] 319 bike racks were also installed.[14] The ballpark's construction team was able to recycle or otherwise divert more than 75 percent of waste from landfills during construction, and 58 percent of materials used to erect the Park came from within a 500-mile radius.

Efficient plumbing innovations are designed to reduce water use at the park by 52 percent, saving six million gallons of water each year compared to the national average for similar stadiums. Changes in landscape design and maintenance will use 60 percent less potable water for irrigation. The facility implemented a comprehensive recycling program, which includes plastics, metals, paper, cardboard and glass.[15] Marlins Park earned LEED innovation points in some areas of the stadium by creating a new floor from recycled Nike shoes.

The Marlins' stadium's retractable roof design presented the greatest challenge in reducing energy use and achieving LEED certification.[16] However, the design team installed solar panels to optimize lighting, mechanical controls, and electrical aspects of the roofing, and was able to achieve a 22.4 percent reduction in energy use, when only 14 percent was required for certification.[17]

SOLDIER FIELD, HOME OF THE CHICAGO BEARS

LEED-Certified for Existing Buildings, May 31, 2012 and First NFL Stadium to Become LEED-Certified

On May 31, 2012, Soldier Field became the first NFL stadium to achieve LEED certification.[18] "Our goal in renovating Soldier Field, which reopened in 2003, was threefold," says Ted Phillips, president and chief executive officer of the Bears. "It was to create the best fan game-day experience in the NFL. It was to enhance the tribute to our war veterans. And it was to enhance and continue the greening of Chicago's magnificent lakefront."[19] To achieve this, the Bears implemented several sustainability initiatives (as well as achieving LEED certification), including an extensive recycling program, the use of green cleaning products, and upgrades of building infrastructure to save energy and water.[20] For example, SMG, the stadium's management company, replaced traditional lighting on stadium columns with LEDs to lower annual energy use and costs.[21] To promote energy-efficient vehicles, the stadium has three electric vehicle charging stations that fans can use at no cost.

The Bears also pursue environmental initiatives in collaboration with other organizations in the wider community. "Knowing the impact that the voice of an NFL team can have on the community, the Bears continue to show our support by encouraging our fans and the public at large to engage in environmentally friendly practices, and to adopt proactive ways to reduce, reuse and recycle their environmental footprint," says Phillips.[22] During the 2011-2012 season, the Bears teamed up with Constellation Energy (CE) to host Soldier Field's first "green game." CE provided RECs to offset expected energy use, helping the stadium to avoid 42 metric tons of carbon emissions. To engage fans, several Bears players also taped public service announcements about environmental awareness and participated in tree-planting events within the Chicago community.[23]

BBVA COMPASS STADIUM, HOME OF THE HOUSTON DYNAMO

LEED-Registered for New Construction, May 12, 2012

On May 12, 2012, before opening, the BBVA Compass Stadium—home of the Houston Dynamo soccer club—demonstrated its commitment to sustainability by registering its intention to achieve LEED Certification for New Construction. The stadium expects to become one of only two LEED-certified sports facilities in Texas (the other being the Houston Rockets' Toyota Center).[24] Noteworthy LEED qualifying features during stadium construction include high diversion of demolition debris to recycling or reuse, use of materials recovered or manufactured within 500 miles of the project site, use of low-VOC products to improve the indoor air quality and the use of post-consumer and pre-consumer recycled products to reduce extraction of virgin materials.[25] The new stadium also introduced water-efficient plumbing fixtures to save water and reduce the burden on the municipal water supply.[26]

BBVA Compass Stadium has partnered with GreenStar Recycling to develop their "Building a Better Planet" campaign to encourage recycling during games and throughout the community.[27] In this program, "GreenDrop" recycling stations replace typical garbage cans. "Partnering with GreenStar allows BBVA Compass Stadium to incorporate a convenient waste diversion system that patrons can easily utilize without increasing operational costs," says Doug Hall, general manager of BBVA Compass Stadium.[28] The stations provide fans with clearly marked and convenient recycling receptacles and the program has been very successful since the facility's opening in May.[29] "I would like to thank BBVA Compass for sharing our vision for the future and our commitment to the community," says Chris Canetti, president of business operations for the Dynamo. "Together we will use the stadium as a driving force toward making a positive impact on the city."[30]

BARCLAYS CENTER, HOME OF THE BROOKLYN NETS

Pursuing LEED Silver Certification, Fall 2012 and Arena With The Best Connection To Public Transit

The new home of the Brooklyn Nets, the Barclays Center, is pursuing LEED Silver Certification for New Construction. Set to open in September 2012, the stadium has undertaken a variety of construction initiatives to build a more sustainable facility in the heart of Brooklyn. For example, the Barclays Center will have the most extensive public transportation options of any sports venue in the country. An existing subway station, one of the most well-connected in all of New York City, is being expanded directly beneath the Barclays Center so that fans won't even have to cross the street to enter the arena from the subway. The station services nine New York City subway lines as well as the Long Island Rail Road.[31] The Barclays Center is an 18,200-seat arena that will host over 220 events annually.[32] "When Barclays Center opens its doors, it will be one of the most extraordinary venues for architecture, technology, customer service, and programming," says Brett Yormark, Barclays Center and Brooklyn Nets chief executive officer. "The reception we've received from Brooklyn has exceeded my expectations. I couldn't be happier for the borough."[33]

As an AEG-run facility, the Barclays Center will also be part of AEG's 1EARTH commitment to environmental stewardship. In 2009, AEG, the largest owner of sports teams and events in the world, committed to measuring the environmental performance of all of its owned and managed venues (totaling more than 100 worldwide). AEG's Ecometrics tracking system collects resource use and waste generation data from all AEG-owned facilities, including measurements for electricity, water, natural gas, carbon, sustainable paper products, green cleaning and other environmental products.

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CHAPTER 4: RECOMMENDATIONS FOR IMPLEMENTING A SUCCESSFUL SPORTS GREENING PROGRAM

This section contains a set of recommendations that can help teams and venues begin or build upon their environmental programs, based on lessons from some of the most well-developed sports greening initiatives in North America to date. By implementing some of this advice, sports teams and venues can gradually improve operations, strengthen their brand, attract green sponsors and engage with fans on this issue. The recommendations below are diverse, as greening strategies vary according to the needs and capabilities of individual organizations. Consider the following 10 strategies for beginning or improving a greening program:

1. RECOGNIZE THAT SHIFTING TO ENVIRONMENTALLY PREFERABLE PRODUCTS AND OPERATIONS TAKES TIME

The infrastructure that dominates the way goods and services are manufactured and supplied in the marketplace has been built up over many decades. In fact, that existing infrastructure, including environmentally harmful production practices, is often supported by subsidies, regulations and vendor relationships that make it more difficult to implement change. Some initiatives, such as energy efficiency audits and water use audits, can progress promptly. But other adjustments, such as actually changing energy-consuming technologies, measuring impacts, shifting to post-consumer recycled content paper products, developing a recycling-based waste management system and providing ecologically preferable food service, can take a few years to implement.

This should not deter you from undertaking the small steps needed to make gradual progress. Give your organization the time it needs to make these adjustments, and let the initiative unfold as slowly as needed to ensure that staff comfort, proper training and implementation, and budgetary restrictions will be respected. This will benefit the longevity and stability of the greening program. Moreover, long-range planning can allow an organization to invest in capital improvements that will save money over time.

2. START WITH EFFORTS THAT HAVE THE FASTEST RETURN ON INVESTMENT: ENERGY, WATER AND PAPER EFFICIENCY PROGRAMS

Starting with cost-saving environmental initiatives helps garner institutional support. Improved efficiency means less waste, which often translates into cost savings as well as savings of energy, water, and other resources. A sports greening program that begins with financially sound environmental initiatives—such as upgrading to more-efficient light bulbs, installing water-efficient fixtures or making double-sided copies and printing less frequently—will help the program gain momentum by cutting costs and attracting interest in other greening opportunities.

3. AUDIT YOUR ENERGY, WATER AND PAPER USE AND YOUR WASTE GENERATION TO SAVE MONEY

Commission an energy, water and waste audit to evaluate opportunities for resource and financial savings. (Many utilities provide free energy audits.) During an energy and water efficiency audit, a trained engineer conducts an analysis of your facility and identifies opportunities for enhanced efficiency that are likely to save your organization money and improve your environmental performance. Using the data collected, your organization can identify the feasibility of various infrastructure upgrades and improved building management systems and the potential for cost savings. Similarly, you can audit waste generation and paper use and identify opportunities to enhance efficiency in those areas.

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4. MEASURE YOUR ONGOING OPERATION—TRACK ENERGY, WATER, WASTE AND OTHER ENVIRONMENTAL COSTS

By tracking environmental data such as energy and water use, waste generation, and paper use, you will be able to assess performance and identify opportunities for improvement. Measuring also allows you to set short- and long-term goals and compare your performance with others in the field. Quantifying successes can help determine where your greening investments can make the most impact and can help your organization document progress, inspiring further investment by staff, partners, fans and sponsors. Some leagues are implementing league-wide tracking systems for environmental metrics like energy consumption, water use, waste/recycling, and paper purchasing. Take advantage of your league's measurement program if it's available. Even if your league doesn't yet offer an environmental tracking system, you can track your team's or facility's environmental metrics using tools like the EPA's Portfolio Manager and WasteWise, or even assemble individual spreadsheets with data supplied by vendors and service providers.

5. ESTABLISH A GREEN TEAM LEADER, RECRUIT INTERESTED STAFF FROM ALL DEPARTMENTS, AND GET EARLY BUY-IN FROM LEADERSHIP

Often a greening initiative is launched by a single person who is motivated to implement change, but a successful greening initiative is one that embeds itself in the culture of an organization. A greening initiative must be bigger than a single person, who may at some point leave the organization. Make sure the greening initiative is supported by upper management to promote organization-wide buy-in. One way to involve staff at different levels is to create an organization-wide environmental mission statement. Also develop environmentally preferable purchasing policies and vendor contracts, and other tools supporting your environmental goals.

6. REALIZE THAT GREENING IS A JOURNEY, NOT A DESTINATION. THERE IS NO GREEN, ONLY GREENER; AND THERE IS NO BEST, ONLY BETTER, AS NEW PRODUCTS ARE ENTERING THE MARKET ALL THE TIME

Greening means reviewing your operations and procurement with an eye toward reducing environmental impacts. It is an iterative, ongoing process. Greening means not just following a checklist, but integrating environmental criteria into ongoing decision-making about products, services and operations. Make a formal environmental commitment where possible in purchasing policies, vendor contracts and sustainability reporting.

Greening is never really finished, because more efficient, environmentally preferable products and services are entering the market all the time. If you aren't able to find the product or service that meets your environmental needs at a given point, keep looking, and continue to let your vendors know what you want; chances are that the product will be available (and affordable) before long. Education of staff, fans, vendors and partners is also an ongoing process. By visualizing greening as a journey, you can celebrate accomplishments along the way and create a flexible initiative that can respond to changes in internal priorities and in the marketplace.

7. SPONSORS AND VENDORS CAN HELP SUPPORT YOUR GREENING PROGRAM. IDENTIFY WAYS TO WORK WITH PARTNERS TO PROFIT FROM THIS SUPPORT

Greening may lead to sponsorship opportunities with existing or new partners who share your goals of environmental stewardship. Involving sponsors and vendors can provide financial and organizational support to your environmental efforts. These partners may bring funding, advertisements and products to your greening effort. Also talk with your sponsors about funding solar arrays, recycling containers or other environmental enhancements to your facility. Collaboration with sponsors and vendors can also help disseminate information about your greening program into your host community. The community's involvement can also help move the marketplace toward more sustainable behavior. Involving your sponsors and vendors sends a valuable signal to the corporate world that environmental issues are important to your organization.

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8. GREENING IS A GOOD BRANDING TOOL THAT CAN HELP RAISE YOUR ENVIRONMENTAL PROFILE IN THE COMMUNITY. ENGAGE FANS IN YOUR GREENING PROGRAM AND COMMUNICATE YOUR SUCCESSES

Greening initiatives can provide opportunities for fans to interact with teams in their community. Fan engagement can be as basic as incorporating visible and well-marked recycling bins at a stadium, inviting community participation in green events, or featuring ongoing displays at a sports facility. Public service announcements or other broadcast initiatives can also yield great fan response. Some teams and leagues are modifying their websites and using social media to bring fans into their greening initiatives. Some communities coordinate sports greening initiatives with community goals and information sharing.

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9. AVOID GREENWASHING, BECAUSE OVERSTATING ACCOMPLISHMENTS CAN BACKFIRE

Don't be shy about communicating success stories, but don't greenwash, either. Exaggerating your environmental achievements can undermine your good work and do long-term damage to your brand. There is no shame is announcing a small accomplishment. Indeed, there is no single business undertaking that can solve our many ecological problems. However small our day-to-day actions may seem, our collective purchases add up to meaningful regional and global impacts. Most individuals and businesses can do only relatively small things, whether it's buying products made with recycled content, using renewable energy, driving a fuel-efficient car, or conserving water. What is clear, however, is that everyone has to do something, regardless of how small it might seem, to reduce their ecological footprint.

10. LEARN FROM OTHERS. JOIN THE GREEN SPORTS ALLIANCE AND USE LEAGUE-BASED RESOURCES

Leagues can offer support by sharing information about better practices that other teams and venues have already implemented. MLB, the NHL and the NBA have, or will soon have, environmental data-gathering systems that can help measure progress and identify opportunities to improve. Green Sports Alliance newsletters, conferences and greening committees are other ways to obtain information about greening.

To get started today on greening your team, venue or event, consult the NRDC Greening Advisor at www.greensports.org for in-depth suggestions on how to adopt greener practices. The Greening Advisor is a free, online guide that helps sports leagues, teams and venues implement environmentally intelligent practices to improve the efficiency of operations, uncover opportunities to cut costs, enhance brands and benefit public health. It covers everything from energy audits and arena transportation to purchasing, travel and waste management.

AFTERWORD

Looking back over the past few years at the environmental progress in the professional sports industry and society in general, we can see remarkable progress being made, sometimes smoothly, sometimes in fits and starts. Bright lights of innovation are leading the way forward. The best-in-class examples documented in this report reveal solutions to some of the most pressing environmental challenges we face. We can learn from the innovators described in this report that are working to make their teams, their venues and their leagues more environmentally responsible. With simple operational changes and minimal investments, we can make major strides to reduce the collective footprint of the globally influential sports industry and its supply chain. However, it's clear that even with our best efforts, we still have a long way to go.

The replication and scalability of these greening initiatives is an important part of the work that will move us forward. Replicating successful strategies brings the lessons of the few closer to being business as usual. Once someone has blazed a trail, it becomes easier for all of those who follow. That's one reason to be thankful for the innovative teams featured in this report who have gone out on a limb to seek ways to solve problems before they were fully aware of the solutions. Along the way, technology and market-readiness also improves, often enabling the price of environmentally-preferred products to come down. Consider the growing success of LED lighting over the past few years, making lighting retrofits more practical and the return on investment even stronger. But given the pace of technological and operational improvements, we need to do more than simply repeat the old models. Replicating the past, even the best-in-class examples outlined in this report, will not, by itself, get us to a sustainable future. We need to create new strategies and new tools along the way.

We might consider a sustainability path for our organizations in three stages. First, recognize our responsibility to improve the way we do business, enhancing the performance of our operations and also reducing our environmental impact. Second, accept that significant effort and investment of time and resources will be necessary to actually do the work and to make progress. Third, develop a clearly defined plan and create accountability for implementation within the organization. With a smart plan in place and a strong team to execute it, environmental initiatives can become part of the regular fabric of operations. Finally, by building in measurement and periodic reviews of

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the plan, progress and goals, the team can make adjustments, add or reallocate resources when necessary, and help to embed the strategies into the culture of the organization, ensuring success year after year.

Once we have these internal strategies in place, we can connect with and learn from each other, from other venues, other leagues, and other industries, a role that the Green Sports Alliance was envisioned to fill. By learning what's working, sharing what's not, and encouraging collaboration and innovation across the leagues, the Alliance has grown from an inspiring collection of six teams and venues, and founding environmental partners, to include over 50 professional and collegiate teams, representing over 13 professional leagues and over 100 sports facilities. This unprecedented international network continues to grow and allows for the rapid transmission of information from one successful project to an operator just beginning to build a plan. This type of collaboration across silos, across leagues and across geography is both necessary and inspirational. It reminds us that while competition is fierce on the court or the playing field, when it comes to environmental initiatives, we all win when we share our successes.

Sports venues are not alone when trying to address environmental initiatives; in fact, a growing number of companies are discovering how important it is to understand the environmental footprint of their business, and find new ways to reduce costs and reduce impacts. As we look forward to the years ahead, there is an opportunity to learn from the sustainability pioneers in the field, and find new ways to apply their innovations in sports venues and help others along the way. We need those leaders to share what they have learned and build bridges to support those just getting started.

To all the sports organizations out there: Get in the game, keep score, and get recognized for the good work you do. The journey toward more sustainable operations is ongoing, but there are plenty of people and organizations who want to help you succeed, if you just ask. It's really pretty simple. Improve your operations, reduce your environmental impact, and reduce your costs. That's just good business.

Martin Tull
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