

# The Greening of Balboa Park: A Holistic, Sustainable and Replicable Model

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## ABSTRACT

Developed for the 1915 Panama Exposition, Balboa Park now houses more than two dozen major museums, performing arts organizations, gardens, and the San Diego Zoo. Located on over 1200 acres of land with over a million square feet of property, Balboa Park is one of the nation's largest urban cultural centers, attracting more than 6.5 million visitors annually from around the world.

Through recent collaborative efforts, Balboa Park is poised to become a national model for cultural institutions and urban parks to achieve environmental sustainability. In 2008 the Balboa Park Cultural Partnership established a Park-wide sustainability program that includes 26 cultural institutions, the City of San Diego, San Diego Gas & Electric, and many other community stakeholders. Designed to be a replicable model, the Partnership's goals are the creation and alignment of sustainable business practices; the identification of, and communication with, key internal and external stakeholders; and the education of visitors, employees, stakeholders, and the public. All sustainability initiatives and results are benchmarked, measured and quantified—a vital component for measuring its carbon footprint and aligning with the state's plan for energy efficiency. The Balboa Park Cultural Partnership (BPCP) has become the first network of cultural institutions in the country to benchmark the energy performance of its buildings using the Environmental Protection Agency's (EPA) ENERGY STAR® Portfolio Manager.

This paper outlines BPCP's approach to energy efficiency, resource management, land use and building retrofits, using the following methodology<sup>1</sup>:

- How the program aligns with the Partnership's mission and vision
- How the initial key stakeholders (internal/external) were identified
- The levels and types of stakeholder engagement
- The program's core areas of focus
- How actions are quantified and prioritized, and
- A review of results, relevant case studies, and future steps.

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<sup>1</sup> This method introduces concepts drawn from the AA-1000 Stakeholder Engagement process outlined by Accountability in London, England.

## **Alignment with BPCP’s Mission and Vision**

The mission of the BPCP Sustainability Program is to educate, measure, and promote sustainable business practices that will preserve and enhance Balboa Park and its cultural institutions. The Partnership serves as the collective voice for its member institutions in Balboa Park. The program’s vision is to bring Balboa Park into greater environmental balance by 2015, the centennial anniversary of the Park, leaving a legacy of a “Green Balboa Park” for future generations.

To accomplish its mission and achieve its vision, it adopted the following core strategies:

- Serve as the recognized hub for information, exchange and sharing for environmental sustainability in Balboa Park.
- Educate and train employees, volunteers, visitors and others about the green projects within the Park; successful projects such as its building retrofits and installation of photovoltaics; and effective methods to manage and preserve the Park’s natural and built resources.
- Prioritize green projects affecting the Park, and attract financial and in-kind support to complete them.
- Establish benchmarks and efficiently measure and report progress to all stakeholders as the projects move from initiation to completion.
- Promote collaboration as a cohesive group of facilities so the Park can operate as an integrated system versus as individual institutions. The program facilitates communication so that all directors and staff can share their sustainable best practices and learn from each other.

## **Identification of Key Stakeholders**

In 2008, the Balboa Park Cultural Partnership and its members formed an alliance of sustainability experts, the City of San Diego, San Diego Gas & Electric (SDG&E), and the California Center for Sustainable Energy. Along with its major contractors and suppliers, these individuals represent its major external stakeholders. Internally, BPCP began its focus by bringing together the facility directors of its member cultural institutions. These directors were chosen as the initial group of internal stakeholders because they oversaw building operations and maintenance at the various institutions and would thus be most involved with the actual implementation of the sustainability activities.

Although many individuals, community groups and other partners certainly contributed to the creation of the Park-wide Sustainability Program, three stakeholders played a formative role: the City of San Diego, SDG&E and the California Center for Sustainable Energy. Through their funding, participation and support, BPCP’s sustainability program not only took life, but continues to thrive and disseminate its ‘environmental success stories. In essence, the City and SDG&E, in collaboration with BPCP, became the driving force to build awareness among Balboa Park stakeholders about the benefits of energy efficiency. Those solid partnerships continue today. BPCP meets on a regular basis with a variety of community organizations and groups to discuss a wide range of sustainability initiatives. For example, BPCP has met informally with the Friends of Balboa Park, the San Diego Association of Governments

(SANDAG), the San Diego Regional Sustainability Partnership and individuals within the community to discuss its core programs and implementation schedule. A more formalized stakeholder engagement process is planned as the programs continue through 2010.

## **A Brief History**

Between 2004 and 2007, the City of San Diego conducted energy audits at nearly all buildings in Balboa Park, using the California Center for Sustainable Energy to complete the audits. The City is the property owner of the buildings in the Park and was responsible for the majority of maintenance, including energy efficiency. Although they identified a definite need for energy efficient programs, there was no funding vehicle for “tenant-occupied” buildings.

The California Center for Sustainable Energy (CCSE), an independent 501(c) (3) corporation that assists residents, businesses and public agencies to save money, reduce grid demand and generate their own power through a range of rebates, assistance and education is another key stakeholder. CCSE became a central source for completing the energy audits and helping the Park house its Park-wide facility data at a central location for easy assessment and retrieval.

Another key stakeholder, SDG&E had been an involved partner in the Park’s move toward energy efficiency for the last decade. It generously collaborated with BPCP to sponsor workshops, community events and programs. In 2008, SDG&E’s first major project was the LED Lighting Retrofit for the Cabrillo Bridge, an historic landmark with great exposure in the community. The project retrofitted 4,000 LED lamps along the Cabrillo Bridge and El Prado (the main thoroughfare through the Park), saving the City more than \$21,000 in monthly energy costs. It also sponsors one of the largest community events, Balboa Park December Nights—a two-day festival that attracts more than 30,000 visitors. For this event, SDG&E installs two 30-foot towers with 28,000 lights that canopy over the Plaza de Prado, and hosts an LED Holiday Light Exchange that enables customers to exchange up to three of their old incandescent light strands for new, multi-colored LED light strands.

But it was through its Energy Efficiency Local Government Partnership with the City that significant funds would be secured and earmarked for the Park’s expanding sustainability efforts, including the implementation of retrofit programs. Recently BPCP was awarded \$400,000 from SDG&E’s Local Government Partnership and \$2 million in federal stimulus funds for energy efficiency projects for the institutions (to be discussed later).

## **Type and Level of Engagement with Key Stakeholders**

BPCP engaged with both SDG&E and the City of San Diego to provide education and training, both basic level and advanced, on a range of energy efficiency topics. Primarily, these two groups worked with the facility directors of the various cultural institutions in the Park, since they were the most directly involved in implementing sustainability initiatives in their facilities. The job was a big one—to educate and train Balboa Park directors and staff to: understand sustainability, be versed in regulatory issues, learn how to benchmark their institutions and gauge their progress, come up to speed on various certifications, and understand how to implement programs to obtain cost savings. Following are examples of engagements within the Park:

- **Sustainability Education.** SDG&E, in collaboration with BPCP, hosted two major Sustainability Kickoff events and two 4 part workshop series from 1/2009 and 1/2010 to educate staff and the public on sustainability with a total of 1,400 attendees.
- **Benchmarking and Understanding Energy Audits.** BPCP facilitated facility manager training on integrated energy audits to identify energy efficiency, demand response, and distributed generation opportunities. SDG&E provided funding for facility manager training on how to use EPA's ENERGY STAR Portfolio Manager and SDG&E's Kwickview online software programs to track and benchmark their individual facilities and view progress of the Park collectively.
- **Cost-Saving Measures.** BPCP facilitated training on SDG&E on-bill financing, which offers eligible customers zero percent financing for qualifying energy-efficient building improvements. On-bill financing helps to offset upgrade costs with rebates and incentives and allows customers the convenience of paying as part of their monthly SDG&E bill.
- **Climate Registry.** BPCP educated facility managers on BPCP's goal of reducing the negative impacts of climate change, in compliance with AB 32, SB 375 and AB 811. It also coordinated with the Climate Registry to implement SDG&E's Cool Planet Program for Greenhouse Gas Reduction using third party verification.
- **Lunch and Learns.** BPCP held informal monthly meetings of Facilities Directors to share information, success stories, and best practices.

## Identify Core Areas of Focus and Goals

BPCP's core area of focus is to reduce its carbon footprint and to significantly advance Balboa Park's environmental balance by 2015. In the context of The Global Warming Solutions Act of 2006, local governments are responsible for implementing measures recommended by the California Air Resources Board (CARB) to reduce California greenhouse gas emissions (GHG) by 25% by 2020. As a leader in sustainability, BPCP is committed to this goal. In addition, it is also a partner through SDG&E in the California Long-Term Energy Efficiency Strategic Plan for local governments. As outlined in its Strategic Plan for Balboa Park (2010-2012), BPCP will address three of the five goals recommended by the local governments plan. These include: (1) spearheading innovative sustainability programs to address climate change goals (and designed to reduce the Park's carbon footprint) (2) promote implementation of energy-efficiency initiatives and (3) educate and train staff to create expertise in sustainability. Through implementation of these goals, BPCP seeks to save the Park \$1.5 million/year in its utility bills, and be able to reduce, reuse and recycle by 50 percent per year.

Specifically, BPCP has initiated the following programs to support its goals:

- **Innovative Sustainability Programs:**
  - As a partner in EPA's ENERGY STAR program, BPCP will benchmark facilities, and track weather normalized energy use intensity (EUI), respective GHG emissions, and water consumption using EPA's Portfolio Manager tool. Through this partnership and benchmarking process, facility directors will better understand how efficiently they use energy, and can then follow the ENERGY STAR Guidelines for Energy Management to develop and implement a plan to reduce energy. Utilizing the Portfolio Manager tool and SDG&E's Kwickview™

online software programs, BPCP will train facility managers to utilize the Portfolio, analyze and share findings, provide performance management as required, and publish results on reductions in EUI, as well as water consumption and GHG emissions.

- LEED Certification: In partnership with SDG&E, the Partnership facilitated the LEED for Existing Building (EB) Certification process and encouraged facility directors to examine their buildings, initiatives and consider applying for certification.
- Implemented a Waste Recovery program to encourage facilities to divert solid waste and recycle, reuse and reduce waste.
- Established group purchasing programs to encourage Park-wide sustainable purchasing plan to reduce costs and identify sustainable products.
- Energy Efficiency Programs:
  - SDG&E's On-Bill Financing Program: Participating with SDG&E and implementing its on-bill financing program, facility directors learned how to implement this zero-financing option for qualifying energy efficient business improvements.
  - Energy Management Control Systems (EMCS), six institutions currently have an EMCS. Five more are scheduled to install a system in 2010/2011. Additionally, an exhibit implemented by the Reuben H. Fleet Science Center acts as a model. The exhibition displays real time energy monitoring so staff and visitors can see the current and past electricity production of the 100kW SDG&E-owned photovoltaic system on the building's roof. This system is a model for other facilities in the Park
  - Consolidated computer servers (six institutions implementing in 2010)
  - Lighting optimization and installation of LED induction street lights and indoor lighting
  - Smart metering
  - Building retrofits
  - Solar technology
- Education and Training Programs
  - Contractors' Educational Seminars: Implemented a series of seminars designed to educate staff on sustainable products and specifically on ways to use/apply the products for energy efficiency and cost savings.
  - Lunch and Learns: These monthly meetings bring together staff to share lessons learned and find creative ways to work together to save energy. The group was informally established as an offshoot of the BPCP Collective Business Operations.
  - SDG&E and City of San Diego Educational Seminars: These sessions are designed to help attendees streamline energy efficiency processes and understand LGP contracts, reporting requirements, invoicing procedures and regulatory and policy updates.
  - Sustainability Workshops: Two major workshops, attended by more than 500 people, were held in 2008 and 2010 to educate all stakeholders on sustainability practices and principles.

## Quantify and Prioritize Actions

To move forward on its goals and implementation of energy efficiency programs, BPCP recognized the need to both quantify and prioritize its actions. It identified three key steps that would provide the information needed to move forward. These included (1) measuring, (2) benchmarking, and (3) managing resources.

First, the Partnership used the 2007 audits (performed by the City of San Diego, in cooperation with the California Center for Sustainable Energy). This information provided the baseline for future assessments. BPCP had to quantify energy usage and to understand the patterns surrounding energy use and analyze each institution's stage of energy efficiency implementation.

Second, BPCP wanted to ensure that facility directors would apply benchmarking to goals and suggested standards. It was important in this stage that the partners gain clarity on the ways that facilities were moving from operating as an independent facility to looking at themselves as part of the larger Park system. Both the BPCP and directors learned that various energy saving initiatives were being implemented among the institutions. This was in part because the buildings were of varying ages and owed by the City. This process helped to facilitate many of the collaborative efforts, such as consolidation of servers, jointly deciding how to install smart metering, and collectively identifying what information would be most helpful in education and training seminars. This process helped facility directors learn how to gauge their energy use status and how to apply various energy efficiency initiatives.

In addition, the facilities in Balboa Park joined EPA's ENERGY STAR buildings program in September of 2009. The ENERGY STAR Buildings Program provides a proven strategy for energy management, and free tools to help building owners and managers set goals, create and implement action plans, assess performance, and earn recognition for superior energy performance. To date, the program has more than 5,000 partners and greater than 120,000 buildings actively tracking energy performance in EPA's Portfolio Manager tool. Just a few months prior to joining, ENERGY STAR had developed a program specifically for entertainment and cultural facilities, after a growing interest from the industry. This program includes outreach and support for museums, as well as other entertainment and cultural facilities such as convention centers, stadiums and aquariums. The Park was the first network of museums in the country join as a collective unit.

Balboa Park is spearheading a data collection initiative in EPA's Portfolio Manager to better understand the Park's energy use. Each facility is benchmarking their weather normalized EUI, respective GHG emissions and water consumption. The Park is also facilitating the use of a shared account so that the participating museums can share their data and compare themselves to neighboring venues. Currently, there are over 19 Balboa Park venues tracking this environmental information. The Park is also using the tool to compare the EUIs of the facilities to the national average EUI for "Entertainment/Culture" facilities nationwide, according to the Energy Information Administration's Commercial Building Energy Consumption Survey.

There are numerous benefits to benchmarking and calculating a museum's EUI. With this metric, museums can compare their performance over time, to surrounding facilities, and to a national average. The museums can also use this metric to set reduction targets, realize energy savings and share best practices with other venues.

Finally, BPCP had to closely examine the connection between managing resources (air, water, soil, waste) and energy efficiency. It became apparent that understanding, managing and preserving resources was critical to saving energy and promoting cost savings. In prioritizing its actions, BPCP chose what it called “the low hanging fruit,” – programs that could be easily implemented as initial energy efficiency options. This choice was made to gain momentum for the initiative by producing immediate successes and cost savings. Once momentum was started, BPCP moved to a more “blended” project (long and short payback period) prioritization strategy. Some of these included: implementing LED lighting where possible, consolidation of servers and installation of Energy Management Control Systems to name a few.

## **Present Results, Case Studies, and Refine Goals/Objectives for Next Cycle**

BPCP is proud of its achievements in energy efficiency and cost savings since its inception in 2008. From 2007 to the end of 2009, Balboa Park facilities saved 4.2 million kWhs for a total cost savings of \$482 thousand. 63 percent of savings came from implementation of lighting programs; 37 percent of savings from HVAC. Although its facilities were owned by the City of San Diego and were thus tenant occupied buildings, the facility directors completed more than \$250 million in capital improvements (including several million dollars in energy efficiency projects) on the buildings they occupy. Park facilities and the BPCP have also contributed more than \$25,000 of in-kind donations of staff time and space to supporting these energy savings efforts. Two facilities are considered stellar examples of energy efficiency applications—the Reuben H. Fleet Space Theater and Science Center and the San Diego Natural History Museum. These will be discussed later in this study. Following are results of key programs initiated by BPCP:

- **EPA ENERGY STAR:** In 2009, Balboa Park became the first network of museums to join EPA’s ENERGY STAR program. 19 facilities started benchmarking in EPA’s Portfolio Manager tool to track energy performance, GHG emissions and water consumption. The Park continues to track this information, and is now sharing energy data and discussing best practices among facilities.
- **LEED Certification:** In 2009, the San Diego Natural History Museum became the oldest LEED-Existing Building; O&M certified museum in then nation and the first in Balboa Park to receive this distinction.
- **Waste Reduction:** Collectively, facilities were able to divert more than 50 percent of their solid waste from a landfill.
- **Group Purchasing:** Balboa Park’s group purchasing program has saved the Park more than \$420,000, since its inception in 2005. Some of the key items responsible for the most cost savings include credit card processing, office supplies, and payroll services. Newset programs are collective general insurance and Payroll services which is estimated to save the institutions 20%.
- **Energy Management Control Systems:** The Reuben H. Fleet Science Center has implemented a first-of-its-kind control system that allows staff and visitors to see the current and past energy use distributed through the photovoltaic system that provides electricity to the facility. It is hoped that other facilities may adopt this procedure to both track energy usage while teaching visitors.

- Consolidated computer servers: In 2010/2011, 25 computers are scheduled for consolidation with a reduction in servers throughout the Park.
- Building retrofits: Since 2007, there have been 20 building retrofits in Balboa Park. Some of these retrofits include Lighting Retrofits at the San Diego Museum of Art facility and EMCS at San Diego Natural History Museum facility.
- Solar technology: In 2007, the Reuben H. Fleet and Science Center partnered with SDG&E and the City of San Diego to install a 10,000 square-foot solar photovoltaic (PV) array on the Science Center's rooftop. The PV array generates up to 100 kW of green electricity for San Diego's power grid.

### **Successful Case Studies: The Reuben H. Fleet and Science Center and the San Diego Museum of Man**

The Reuben H. Fleet Science Center (the Fleet), is a nonprofit, educational institution with a focus on science, technology and the environment. The Fleet is a 93,505 square-foot facility with more than 100 interactive science exhibits, including one called, SoWatt!, which focuses on energy efficiency and electricity production. This exhibit displays a real time energy monitoring system that allows visitors and staff to observe the current and historical electricity production of the 100-kW SDG&E-owned PV system on its roof. Through its ongoing efforts, the Science Center hopes to serve as a model for museums and urban parks across the nation. The Fleet also joined as an ENERGY STAR® partner and was recognized by EPA as a success story posted on the ENERGY STAR® Web site. The Fleet also presented their efforts at an EPA ENERGY STAR® hosted Webinar that was attended by entertainment facility managers from across the country. The success story can be found at:

[http://www.energystar.gov/ia/business/entertainment/Success\\_Story\\_Fleet\\_Science\\_Center.pdf](http://www.energystar.gov/ia/business/entertainment/Success_Story_Fleet_Science_Center.pdf)

The following is a list of actions accomplished in six key areas of sustainable business practices:

- **Sustainable Sites**
  - Stormwater management plan directs all runoff into groundwater sources in Balboa Park
  - Environmentally sensitive pest management practices reduce chemical use and runoff
  - Reduction in conventional commuting trips among employees reduces pollution
  - Cool roof reduces heat island effect
  - A bioswale(landscape elements designed to remove silt and pollution from surface runoff water).in the park treats and filters water runoff
  - Exterior downlighting reduces light pollution
- **Water Efficiency**
  - Waterless urinals and low-flow faucets reduce indoor water use by more than 30%
- **Energy & Atmosphere**
  - Building commissioning ensures systems are operating at optimal levels to maximize energy efficiency.

- Automated Building Management System monitors and controls key building systems to perform at optimal levels
- The Fleet installed 100 kW of on-site photovoltaic system offsets approximately 15% of the facility's energy needs
- Lighting fixtures were retrofitted with energy efficient CFL and LED bulbs, as well as motion sensors
- Centrifugal chillers with oil-free compressors replaced old chillers, which are 30-40% more efficient
- **Materials & Resources**
  - A sustainable purchasing plan was established, including every day office supplies and durable goods, such as monitors and refrigerators
  - Reduced toxic materials, such as lamps containing mercury
  - Diverts more than 50% of their solid waste from landfill through a park-wide waste recovery program
  - A waste stream audit was conducted to improve diversion rate and track progress.
- **Indoor Environmental Quality**
  - There is a no-smoking policy for the entire building and the Park
  - A green cleaning policy improves the work environment for maintenance personnel, museum employees and museum visitors
  - Increased ventilation and indoor air quality management provides healthy environment for building occupants and visitors
  - An occupant comfort survey was conducted to assess the level of occupant comfort and to correct any issues
  - Occupant controlled lighting and thermal systems
- **Innovations in Operations**
  - Interactive exhibits educate visitors of all ages, specifically about energy efficiency and water conservation
  - Educational signage is placed throughout the building for visitors and occupants to learn about the sustainable features incorporated in the facility
  - Both museums work with the Balboa Park Cultural Partnership to help others learn about sustainability, including hosting public workshops and training events

## **The San Diego Natural History Museum**

The San Diego Natural History Museum (SDNHM) is a 150,000 square-foot facility, housing more than 30,000 square feet of gallery space to present core and traveling exhibitions. SDNHM's mission is to inspire respect for nature and the environment by conducting scientific research and public programming that promote increased understanding and appreciation of the southern California and Baja California region. The Museum attracts more than 250,000 visitors annually and serves an additional one million people through public programs and its website.

In December 2009, the San Diego Natural History Museum was awarded LEED certification for Existing Buildings: Operations & Maintenance (LEED-EB: O&M) Certification, established by the U.S. Green Building Council and verified by the Green Building Certification Institute. The certification was awarded for efficiency in energy use, lighting, water and material use as well as incorporating a variety of sustainable strategies.

Built in 1933, and expanded in 2001, the San Diego Natural History Museum became the LEED-EB: O&M-certified museum in the nation and first in California to certify under LEED for Existing Buildings: Operations & Maintenance. The Museum is the only museum in San Diego County, and the first in Balboa Park to achieve LEED-EB: O&M certification. Nationally, there only three LEED-certified natural history museums: The California Academy of Sciences in San Francisco, the Water+Life Museums in Hemet, CA, and the Carnegie Museum of Natural History in Pittsburgh, Pennsylvania. The Getty Museum in Los Angeles is also LEED certified for Existing Building under an earlier version of LEED-EB.

The process of LEED certification for the San Diego Natural History Museum started in early 2007 and was completed in June 2009. During that time, sustainable policies and management plans were written, energy-performance data collected, and occupant surveys conducted. The Museum got a kick start to pursue LEED certification when it committed to presenting the Dead Sea Scrolls exhibition in 2007. To meet environmental standards required by the Israel Antiquities Authority SDNHM committed to upgrading the air quality, controlling air moisture, air temperature, and air volume. These improvements were achieved through a substantial upgrade of the Museum's mechanical systems.

This effort did not come without challenges. The San Diego Natural History Museum has over 13 different environmental control areas. Within these areas there are 130 zones, each with its own unique temperature requirements and five areas that require precise humidity and CO2 monitoring due to collections and archival materials. The Museum's situation required individual analysis of each system serving the areas. After implementation of the new Honeywell control system and other mechanical upgrades, the Museum is benefiting from a comfortable environment and a reduction of energy consumption upwards of 20% that will result in a payback of two years or less, as well as ongoing energy savings.

Green Cleaning credits for the project accounted for one prerequisite and seven credits toward certification. The primary challenges were identifying potential areas for improvement, creating the appropriate formats to document the cleaning effectiveness of the custodial operations, and measuring the percentage of green product purchases for the Museum. It was also necessary for the Museum to create green-cleaning policies and procedures. The resulting low-environmental-impact, high- green-cleaning program augments the mission and vision of the Museum by focusing attention on how to better reduce the health and environmental impacts associated with the cleaning function.

SDG&E analyzed six years of energy-usage data to reduce and optimize the Museum's future energy consumption. They coordinated light and water surveys to ensure the most efficient energy usage, as well as employee surveys to track their use of alternative transportation.

San Diego Natural History Museum's Education Department delivers programs like BioBlitz and the Sustainable Planet Lecture Series, through which the Museum aims to strengthen the bond between nature and participants. The Sustainable Planet Lecture Series hosted four sold-out lectures addressing issues like The Coming Fight for Water and Thinking Like a Watershed, which complemented the two water exhibitions the Museum hosted. 2009 was a landmark year for education in terms of sustainability exhibitions: Water: A California Story and Water: H2O = Life could not have been more timely as San Diego enters into mandatory water rationing. The Museum's next step is education so that all staff members and visitors to the Museum will understand what it means to operate, maintain and thrive in a green building.

## **A Work In Progress- Lessons Learned**

Through the implementation of the Park's Plan, BPCP has experienced various challenges and is committed to incorporating the following strategies to overcome these challenges:

- Identify staff expertise and provide the appropriate entry point into the process.
- Continue to refine the Lunch and Learn programs to accommodate learning and encourage more advanced sustainability suggestions.
- Develop incentive programs for gathering and completing data and for engaging frontline staff to suggest cost-saving sustainable practices
- Develop multi-level sustainability education programming to accommodate initial to advanced learning by the public in core areas
- Identify contractors who can assist with research, analysis, education and implementation of sustainability programs.
- Compile a directory of vetted and proven Park contractors compiled by the Park Facilities Directors.
- Implement a more formalized stakeholder engagement process to identify key stakeholders and the issues they wish to discuss.
- Provide organizational development programs for all levels of staff—from executive directors, CFOs, facilities directors and others.
- Continue educational programs on how to enhance and improve implementation of the ENERGY STAR program, specifically how to take advantage of the ENERGY STAR tools and resources to realize energy and cost savings while simultaneously communicating environmental sustainability to both staff and visitors.

### **Refine Goals and Objectives**

BPCP has achieved many of its initial goals for its energy efficiency efforts but has set its sight on even greater achievements in the years to come. With funding from both SDG&E and the City of San Diego, it hopes to save between 8,000,000 kWhs by 2013 and reach 10,000,000 by 2015, Balboa Park's Centennial. This will save the institutions \$1,500,000 per year in utility bills.

The BPCP is a replicable program with a solid base of sustainable business practices now in place. The ability to track, benchmark, adjust and improve practices related to energy efficiency has been core to its success. Utilizing EPA's Portfolio Manager benchmarking tool, Park officials can now view, analyze and discuss possible process improvements with their colleagues in the Park. This system can certainly be replicated in other museums and Park facility managers can discuss this successful initiative with other museum officials. By encouraging other museums to benchmark their facilities and share their data through the Portfolio Manager tool, Balboa Park is helping the industry move towards an ultimate goal of developing an industry-wide average for museum energy consumption.

Balboa Park will also continue to promote its sustainability efforts to staff and visitors, so all individuals can learn and become inspired to make similar commitments to energy efficiency in their homes and communities. Furthermore, as the building managers of Balboa Park venues

continue to improve their energy efficiency practices, they can serve as role models not only for other cultural facilities, but for all buildings in the City of San Diego.

In reducing its overall carbon footprint, Balboa Park understands that its effort must be shared with all stakeholders involved in the Park’s operations. In the future, BPCP will be working hard to achieve an alliance of dedicated stakeholders, who are educated, inspired and passionate about the sustainable agenda. It will be important that all individuals know they play a vital role in reducing energy consumption and preserving the Park’s natural resources. It is work that is ongoing. BPCP is proud of the achievements it has made to date, achievements that have only been made possible through deep collaboration of its members, the City of San Diego, the California Center for Sustainable Energy, and San Diego Gas & Electric.

To achieve the above energy savings, the Park has identified the following Balboa Park energy efficiency projects:

Replace incandescent bulbs with CFLs	Replace T12 tube lights with T8s and T5s
Install efficiency museum gallery lighting (ceramic metal halides and halogen)	HVAC (heating, ventilation, air conditioning) and controls
Retrofit and/or replace HVAC systems, such as water-cooled chillers	Replace or upgrade existing air handling units with high efficiency variable air volume models
Install variable frequency drives on chilled water pumps	Install LED dual level emergency lighting systems
Install occupancy sensor lighting and power strips	Replace refrigerators with new ENERGY STAR rated appliances
Install soda machine controls	Computer Server Consolidation
Energy Management Control Systems	

## References

Balboa Park Cultural Partnership. 2009. Environmental Sustainability Strategic Plan for Balboa Park 2010-2012, San Diego, California

Include references for Climate Change legislation (besides bill numbers).

Climate Change Registry

US Green Building Council for LEED information