# SUSTAINABILITY OF AN INDUSTRY: GREEN BUILDINGS AND GREEN EVENTS

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## INTRODUCTION

*The concept of sustainability is used to represent several different ideas and notions as they relate to environmental conservation or consciousness. However, for the purposes of this article we will be referring to the concept of sustainability as defined by the World Commission on Environment and Development,[2] which defines sustainable as "Activities that meet the needs of the present without compromising the ability of future generations to meet their own needs." This definition implies a balance between economic, environmental, and social considerations, often referred to as the "Triple Bottom Line."*

*For venue operators and meeting professionals, the current focus on green meetings is becoming increasingly apparent. Once referred to as a "throw away industry," the meetings industry is experiencing a revolution as national, state, and city planners, as well as venue operators and meeting associations are acknowledging the importance of adopting sustainable practices. As a result of this shift and recognition, many facilities and planners have begun to implement actions to reduce their environmental impact. However, it seems that just as the practices of green building and sustainable operation and maintenance are increasing in popularity, so are the questions, misconceptions, and roadblocks. These may come in the form of lack of funds, unwillingness to change standard behaviors, or resistance from vendors. In my role as the Sustainable Programs Manager for the Colorado Convention Center, I have worked with many clients who would like to produce more sustainable events but feel overwhelmed with where to begin focusing their efforts. I have also worked with several facilities experiencing the same frustrations and roadblocks. Nevertheless, in the past few years, practices that were once seen as unreasonable are now viewed as standard, and more advanced practices are receiving serious consideration and implementation.*

*In this article, we will review the history of LEED for convention centers and initial practices; the importance of establishing a commitment to sustainable practices from top executives; areas of focus; metrics; and finally, the future of the industry including checklists for vendors and planners.*

## HISTORY OF CONVENTION CENTERS AND SUSTAINABILITY

### *LEED*

Green building has been a growing trend throughout the country in the past 15–20 years. More builders have been using sustainable building materials, recycling construction debris, and incorporating environmentally-friendly and efficient architecture in building designs through the years. What exactly constitutes a "green building" has been scrutinized, with no one outline defining the phrase. Does the use of recycled materials make it a green building? How about using energy efficient insulation and windows? What if a facility uses recycled content paper? Who is qualified to say? That is until third party verifications were introduced to help provide credibility to green building by creating guidelines and checklists to ensure certain standards are being met. The U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program is the most widely recognized third party green building certification program in the country, providing clarity to an otherwise ambiguous term.

LEED provides stringent guidelines for numerous aspects of buildings, including Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Air Quality. Thousands of buildings nationwide have gained certification through the LEED program since its inception in 1998. However, due to the challenge

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of altering LEED criteria to fit such large facilities, convention centers took longer to join the LEED movement. LEED standards were designed to accommodate much smaller buildings that consume less energy and use fewer resources, and projecting those numbers to convention centers proved to be a formidable task.

While convention centers have incorporated green practices for many years, such as recycling and utilizing motion sensors in restrooms, until somewhat recently, none had actively sought LEED certification. The first convention center to accept the challenge was the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. The old convention center was torn down, and the new one was built on the same site with LEED in the initial plans. Debris and demolition waste were recycled and incorporated into the new building, minimizing resources used for construction. The building was designed to maximize the use of natural light and ventilation, and those factors, combined with many other sustainable elements, gained the convention center LEED New Construction Gold Certification in 2003. The convention center was the first in the country to obtain LEED certification, and its Gold certification is still the highest among convention centers today.

The Oregon Convention Center in Portland, Oregon followed suit, becoming the second LEED certified convention center in the country in 2004. The Oregon Convention Center gained LEED Existing Building (EB) Certified status, which involves unique challenges outside of the New Construction certification. One of the biggest obstacles involves demonstrating that the facility's historical energy consumption meets a sufficient level of efficiency. This actually continues to be one of the largest challenges in obtaining LEED EB status for convention centers, but the Oregon Convention Center was able to find a unique solution to the problem, eventually achieving certification.

More convention centers have gained LEED certification since, with a total of nine LEED certified convention centers nationally, six of which are New Construction and three of which are Existing Building. With fifteen convention centers currently registered as seeking LEED certification, this number will continue to rise as convention centers begin to see the benefits of obtaining LEED certification, such as reduced operating costs, increased visibility and marketability, and their reduced environmental footprint.[3]

In addition to their size, a challenge unique to convention centers lies in the fact that they are susceptible to the actions of their clients and the attendees. Competition for meeting business is high, and as a result, the notion of placing strict environmental requirements on clients is unreasonable. Therefore, convention centers are tasked with operating their buildings in the most efficient way possible while accommodating the ever changing needs and demands of their various clients.

Therefore, many convention centers are evaluating the practices and aspects of their operation in which they can control. For example, among the numerous practices in place at the Colorado Convention Center, there is written verbiage in the contract stating that lighting and HVAC systems will run at 50% during move-in/outs. If the client requests either system to be run at 100% during times other than event times, charges are incurred. The scope of influence for the convention center also extends to various vendors and contractors wishing to conduct business in the center. For these companies, the Colorado Convention Center includes language in contracts requiring environmental compliance with policies.

## COMMITMENT: FROM THE TOP

Obtaining commitment from executives, officials, or board members is imperative to a successful green program. Commitment not only gives authorization to change procedure and implement new policies, it also permits contract language and decisions to be made based on sustainable practices for vendors and other services. Many cities are working toward redefining themselves as "Green Destinations." For example, Denver's Mayor, John Hickenlooper, created the city department Greenprint Denver, to focus specifically on the environmental issues and impacts of the city. By making a commitment and establishing an agency to have authority over other city departments, the concept of sustainability is interwoven into the fabric of policies and decisions. In support of

this governmental commitment, and with help from the Environmental Protection Agency (EPA), several large public and private venues in Denver (including the Colorado Convention Center) recently joined forces to form the Rocky Mountain Green Venues Partnership (RMGVP). Members of the partnership signed a charter pledging to participate in programs and implement policies that consider the triple bottom line of sustainability, which encompasses environmental, economic, and community values. The Charter states:

> *The core of the RMGVP is a set of 9 principles or areas in which venues demonstrate their commitment to improve sustainability for the facility and the community:*[4]
>
> - *Energy Conservation and Efficiency*
> - *Water Conservation and Efficiency*
> - *Responsible Materials and Waste Management*
> - *Transportation and Air Quality*
> - *Green Buildings*
> - *Local Food and Agriculture*
> - *Environmentally Preferable Purchasing*
> - *Green Economy*
> - *Community Connections*

As a result of measureable improvements in energy use, water consumption, materials/waste management, air quality, and other environmental areas, the venues expect to experience economic benefits resulting from reduced operating costs and the marketing value attached to a green facility and destination.

While involvement in a formal charter or program is beneficial, an organization's commitment doesn't need to have the Charter's level of formalization to still be effective. By adopting an Environmental Policy Statement with concrete actions, an organization is creating a standard for their ideology and a platform for policy creation. Elements of an environmental policy should reflect and support the specific procedures and practices of the venues operation. At a minimum, this policy should contain the following:

- Mission and core values with respect to the environment.
- Framework and procedures by which environmental issues and impacts are identified, addressed, measured, and implemented, including evaluation protocols.
- Commitment to control and improve environmental performance, using measurable metrics.

In addition to being designed to meet the venue's specific environmental impact, thereby acting as the environmental framework for policy development, this policy should commit the venue to continual improvement. It is recommended that a venue annually or semi-annually review its policies and objectives to ensure it remains relevant and effective within the venue's activities. If it is found ineffective, then the venue should be reevaluated and modified.

A major aspect of the policy relates to environmentally preferable purchasing. It is important that written parameters are established to ensure that products and services are chosen that support and reflect the environmental impact reduction goals of the venue. These parameters may be developed using third party verifications and/or existing regulations. For example, the Colorado Convention Center procurement policy combines standards from California and other boards (see Figure 1). The U.S. Environmental Protection Agency has also developed Environmentally Preferable Purchasing guidelines to help consumers evaluate information on products, questions to ask, and other tools. For more information visit their web site at www.epa.gov/epp/.

Last but not least, the Environmental Policy will need to be communicated with all employees, vendors, and stakeholders. Recognition of this commitment from venue executives, as well as a clear understanding of how this affects their role within the organization, are crucial components to successful implementation and buy in. In addition, the Environmental Policy should be clearly communicated to the general public. In doing so, the venue not only creates accountability, but also receives positive recognition for its efforts within the community.

## COMMITMENT: EMPLOYEE BUY IN

Once the policy is communicated with employees, a venue should continually work to ensure employee commitment and understanding. As the first point

**FIGURE 1.** SMG Procurement Policy.

**A.1 SMG PROCUREMENT POLICY AND GUIDANCE:**
SMG, through its corporate social responsibility, is committed to protecting the environment, and the health of the public, the client, and its employees. In accordance with this policy, SMG facilities are directed to procure cost-competitive products and services that minimize resource consumption and negative impacts on the environment, resources, and human health.

In requesting proposals for SMG, when specifically required in the evaluation criteria, expects all responsive proposers to demonstrate commitment to and experience in environmental sustainability and public health protection practices applicable to their line of services. The facility during its evaluation processes will actively assess the quality and value of all proposals.

Vendors, when applicable, are to follow standards and recommendations of the United States Environmental Protection Agency EPP program, the Green Seal organization, and standards and practices specified by the U.S. Green Building Council, including the Leadership in Energy and Environmental Design (LEED) program.

**A.1.a Environmentally Preferable Purchasing (EPP) Guidance and Prohibitions:**
SMG defines Environmentally Preferable products and services as having a lesser or reduced effect on human health and the environment when compared with competing products and services that serve the same purpose. The facility's EPP evaluation may extend to raw materials acquisition, energy consumption in manufacturing and transport, packaging, recyclability, waste disposal, and many other factors.

Applicable EPP considerations may factor in the evaluation process of this Proposal. Vendors are encouraged to describe any EPP attributes of the goods or services they offer to the facility.

**Products and services with the following attributes meet basic EPP and SMG standards, and are favored for procurement:**

- Green Seal approved products and services
- Energy Star certified equipment
- Specific Conformance to Green Seal GS-11 and GS-37 standards
- Conformance with California Code of Regulations for maximum allowable VOC content
- Conformance with SCAQMD Rule #1168, or BAAQMD Regulation 8, Rule 51
- Conformance with Carpet and Rug Institute Green Label/Green Label Plus Programs
- Product listing with the Western Regional Pollution Prevention Network
- Product listed with the Center for the New American Dream
- Disposable janitorial products conformance with USEPA Comprehensive Procurement Guidelines
- Products supplied in concentrate
- Products dispensed through automatic metering and mixing equipment
- Products with high recycled material and post-consumer waste content
- Products with minimal petrochemical content
- Highly durable / long-lasting products and applicators
- Products shipped in bulk
- Neutral pH products
- Non-flammable products
- Fragrance and dyes free products
- Proven rapid bio-, photo-, or chemical degradation
- Non-aerosol products
- Locally reusable / locally recyclable packaging
- Other characteristics that can be shown to:
  - o Minimize waste
  - o Minimize consumption of energy and resources
  - o Minimize release of toxic compounds
  - o Minimize exposure of workers and the public to pollutants

**Products and services with the following attributes do not meet EPP or SMG standards, and are discouraged from procurement under this proposal:**

- Combination cleaner-disinfectants
- Products which liberate ammonia (CAS 7664-41-7)
- Products containing the following substances, except in trace amounts (< 0.1%):
  - o alkylphenol ethoxylates
  - o 1,4-dioxane (CAS 123-91-1)
  - o Nitrilotriacetic acid (CAS 139-13-9)
  - o Sodium ethylenediamine tetraacetic acid (CAS 60-00-4)
  - o 2-butoxyethanol or 2-butoxyethanol acetate (CAS 111-76-2, and CAS 112-07-2)
  - o ethanolamine (CAS 141-43-5)
- Products containing phosphates or phosphonates in excess of 0.5% phosphorous by weight
- Products with a Flashpoint of less than 140°F

**FIGURE 1.** SMG Procurement Policy *(continued)*.

- Products with a pH of less than 2.0 or greater or than 12.5 at their least dilute working strength
- Products containing more than 20% VOCs by weight
- Products having RCRA Hazardous waste characteristics in their least dilute working strength
- Practices resulting in the air-borne dispersal of dusts and soils
- Practices which rely on volatilization of organic solvents or result in the significant generation of chemical fumes or vapors.
- Practices which prevent the capture and collection of wastewater and water-borne pollutants.
- Products whose principal ingredients are readily absorbed through skin, or cause dermal irritation or sensitization on contact, or rapidly destroy skin tissue or the mucous membranes.
- Products supplied without clearly readable labels that describe product hazards, precautions, and instructions on use and disposal.
- Products for the safe use of which workers must don specialized respiratory protection or general splash protection equipment.

**The following products and services are prohibited from procurement under this proposal:**

- Products containing persistent bio-accumulative toxics
- Products containing Asbestos
- Products containing known carcinogens, mutagens and teratogens
- USDOT Inhalation Hazard rated materials
- Halogenated compounds with an Ozone Depletion Potential greater than 0.01
- Products which have a high risk of causing spontaneous combustion
- Strong chemical oxidizers
- Products containing the chemical elements or compounds listed in Table 1
- Products containing chemical compounds deemed by the Denver Department of Environmental Health to present an undue of risk to human health or the environment in their use or disposal.

Upon request, the vendor must submit documentation proving that all procured products and services meet the prohibitions listed above.

**A.1.b Table 1: Prohibited Chemicals and Compounds**

| | Chemical Name | CAS Number | Comments |
|---|---|---|---|
| 1 | Arsenic | 7440-38-2 | |
| 2 | Arsenic, compounds of | various | |
| 3 | Barium, compounds of | various | not including alloys |
| 4 | Cadmium, compounds of | various | not including alloys |
| 5 | Carbon tetrachloride | 56-23-5 | |
| 6 | Chlorobenzene | 108-90-7 | |
| 7 | Chloroform | 67-66-3 | |
| 8 | Chromium, compounds of | various | not including alloys |
| 9 | 1,2-Dichlorobenzene | 95-50-1 | |
| 10 | 1,4-Dichlorobenzene | 106-46-7 | |
| 11 | 1,2-Dichloroethane | 107-06-2 | |
| 12 | 1,1-Dichloroethylene | 75-35-4 | |
| 13 | Hexachlorobenzene | 118-74-11 | |
| 14 | Hexachloroethane | 67-72-1 | |
| 15 | Hydrofluoric Acid | 7664-39-3 | |
| 16 | Lead, compounds of | various | not including alloys |
| 17 | Mercury, elemental | 7439-97-6 | not including amalgams |
| 18 | Mercury, compounds of | various | |
| 19 | Methylene chloride | 75-09-2 | |
| 20 | Nitrobenzene | 98-95-3 | |
| 21 | Pentachlorophenol | 87-86-5 | |
| 22 | Selenium, compounds of | various | |
| 23 | Silver, compounds of | various | not including alloys |
| 24 | Tetrachloroethylene | 127-18-4 | |
| 25 | 1,1,1-Trichoroethane | 71-55-6 | |
| 26 | 1,1,2-Trichloroethane | 79-00-5 | |
| 27 | Trichloroethylene | 79-01-6 | |
| 28 | 2,4,5-Trichlorophenol | 95-95-4 | |
| 29 | 2,4,6-Trichlorophenol | 88-06-2 | |
| 30 | Vinyl chloride | 75-01-4 | |

of contact for many attendees, as well as the individuals implementing and adhering to the policies, both are required from employees for a successful program. For example, the effort of an attendee to put an aluminum can in the recycling bin is pointless if the housekeeping department doesn't follow through by making certain that bag makes it to the proper recycling compactor. Along the same lines, if an attendee inquires about the convention center's environmental practices, and an employee doesn't know the answer, the sincerity of the program is lost. Therefore, it is important to include environmental policy and trainings in all manuals and new employee hires. At the Colorado Convention Center, we achieve this by holding departmental training sessions regarding our sustainable policies and require employees to sign a pledge of understanding (see Figure 2). In doing so, employees understand that adherence to the program is a part of their job description and upper management takes the policy seriously. Recognition programs such as the quarterly "Champion for the Environment" award are in place for employees who go above and beyond as advocates. These employees receive acknowledgement amongst their peers and management, as well as awarded a paid day off of their choice. Ongoing training, commitment from employees and employers, and recognition of employee efforts all contribute to a program in which all members of the organization can feel involved, engaged, and proud.

## COMMITMENT: CLIENTS

As with venues, many organizations and associations such as Patagonia, US Green Building Council, and Starbucks include Corporate Social Responsibility (CSR) as a part of their identity and mission. Therefore, sustainable meetings and events are expected by attendees and stakeholders. However, for other organizations, while the impact and importance of hosting a green conference is just as important, the motivation is not as obvious. For that reason, true value in sustainable meetings must first be demonstrated to the organization before implementation is adopted.

When presenting the need for green meetings to executives, the following points can be used as incentives:

1. Green meetings can be more efficient and present many cost savings. For example, the savings of providing water stations or water pitchers vs. individual bottles of water (which can cost upwards of $4 a bottle).
2. Green meetings conserve valuable resources. For example, by using reusable signage, your organization is saving money and resources needed to produce new signs, as well as diverting landfill waste.
3. Employees recognize their company's attention to the environment and the world as a positive benefit. Therefore, employee turnover is reduced, thereby reducing cost of new employee training.
4. Many consumers, when presented with a choice between two similar products, will choose the one with "green" properties over the conventional product if all other factors are the same.
5. Adopting a CSR policy can improve a company's public image, possibly increasing sales and loyalty by consumers.

Once commitment is made and a sustainable policy is adopted by an organization, the next step is communication and education of vendors and stakeholders. This second step is critical for several reasons. Not only does it inform them of the company's or association's corporate social responsibility (CSR) and Environmental Policy, but once attendees understand this, they have an understanding as to why certain practices have changed. Often, if informed about the benefits of the change, the attendee will be engaged and enthusiastic about participating. For example, someone who expects plastic water bottles as a meeting standard would likely be more understanding of the switch to pitchers of water if the environmental benefits were explained.

Some easy ways to communicate your CSR policy are the following:

1. Send out all communications via email or make available on web sites. Explain to attendees that this is an effort to reduce use of paper and the carbon output of mailings.
2. During RFP process with vendors, include sustainable practices into your request. Explain that your organization is producing a sustainable meeting, and their compliance in this practice is contractual.

**FIGURE 2.** Sustainable Employee Policy.

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## SUSTAINABILITY PROGRAM GUIDELINES

## SMG - DENVER

*Please carefully review the following and sign and date the attached "Certification Form" to indicate your understanding and acceptance of this policy. Return the "Certification" with your new hire paperwork.*

SMG Denver is committed to implementing sustainable policies with the goal of reducing our impact on the environment and the conservation of valuable resources. Our commitment is in the areas of Waste Diversion, Water Conservation, Energy Reduction, and Air Quality. Success of these programs is dependent on the participation, understanding, and commitment of all employees. Employees are therefore expected to understand and comply with the following guidelines.

**WASTE DIVERSION**
Placing recyclable items in the appropriate bin. The following items are currently accepted as recyclable:

- PLASTICS 1-7
- PLASTIC CONTAINERS (ANY SHAPE)
- ALUMINUM CANS
- ALUMNINUM FOIL
- TIN CANS
- GLASS BOTTLES
- CLEAN CARDBOARD
- PAPER – WHITE AND COLORED
- MAGAZINES
- NEWSPAPER
- PAMPLETS

Placing compostable materials in appropriate bins when provided. These locations include break and lunch rooms, and restrooms. The following items are acceptable for compost:

- ANY FOOD - COOKED OR RAW
- COFFEE GRINDS
- BONES
- DAIRY – CHEESE, YOGURT, MILK,
- MEAT
- POULTRY
- FISH
- FRUIT AND SALAD TRIMMINGS
- EGG SHELLS
- OILS, FATS, BUTTER
- LIQUIDS AND SAUCES
- BREADS, ETC.
- PAPER NAPKINS
- PAPER TOWELS
- EGG CARTONS
- CARDBOARD - DIRTY AND CLEAN
- WOOD PALLET AND CRATES
- WAX COATED CUPS

If a recycling container is not placed with your trash can, please request one from the housekeeping department.

**FIGURE 2.** Sustainable Employee Policy *(continued)*.


**WATER CONSERVATION**

- Turn off sinks when not in use.

**ENERGY REDUCTION**

- Turn off lights when leaving a room
- Close rollup doors
- Turn off escalators if no longer needed for event

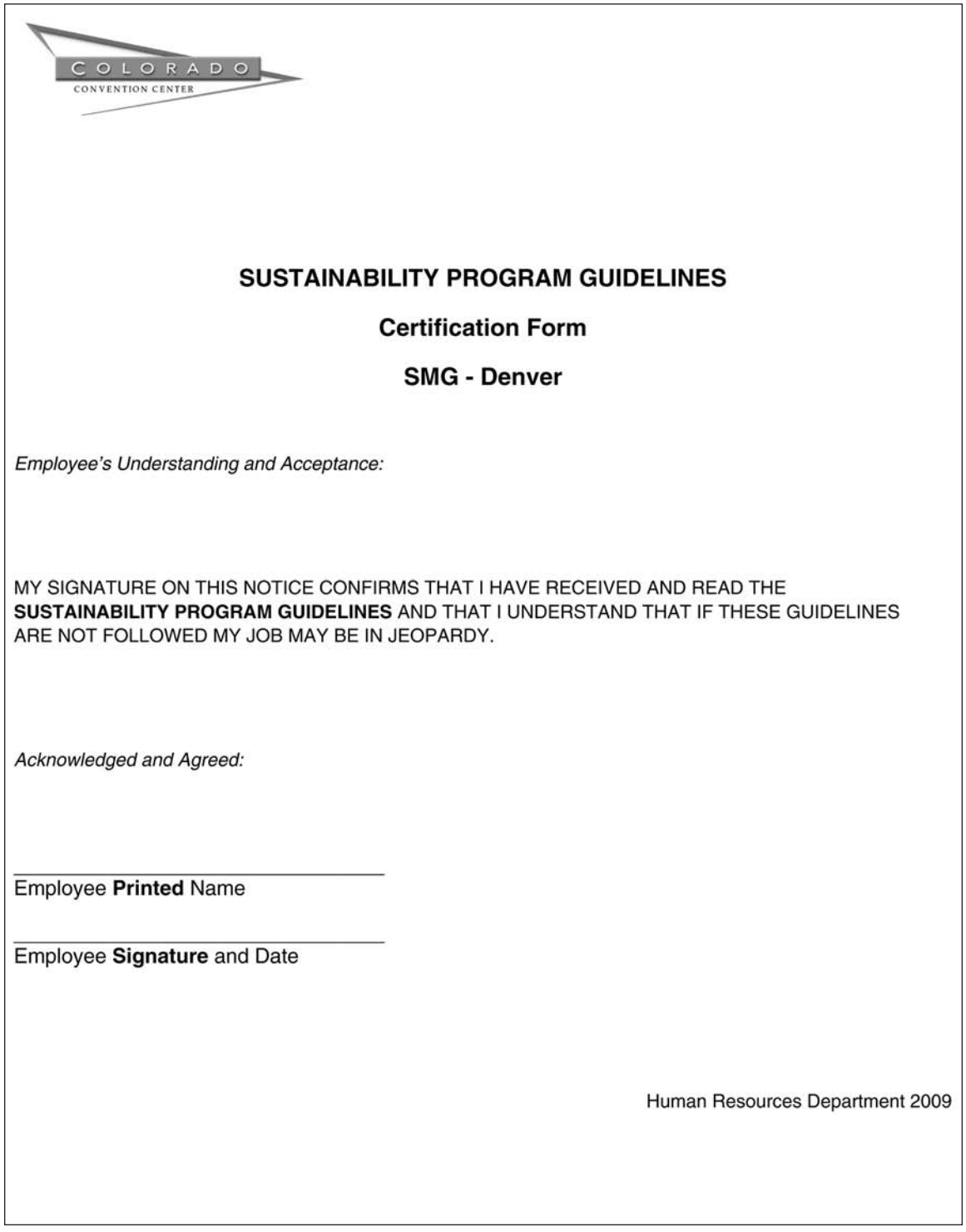
**AIR QUALITY**

- Adhere to City of Denver's Idling Ordinance of 5 minutes of less unless The ambient outside air temperature has been less than twenty (20) degrees Fahrenheit for each hour of the previous twenty-four (24) hour period; orthe latest hourly ambient outside air temperature is less than ten (10) degrees Fahrenheit.

If you are uncertain about your department's responsibility in our sustainability program, please direct questions to your department Director or Manager. Violation of Company or departmental work rules may result in disciplinary action up to and including termination.

Human Resources Department 2009

**FIGURE 2.** Sustainable Employee Policy *(continued)*.



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**SUSTAINABILITY PROGRAM GUIDELINES**

**Certification Form**

**SMG - Denver**

*Employee's Understanding and Acceptance:*

MY SIGNATURE ON THIS NOTICE CONFIRMS THAT I HAVE RECEIVED AND READ THE **SUSTAINABILITY PROGRAM GUIDELINES** AND THAT I UNDERSTAND THAT IF THESE GUIDELINES ARE NOT FOLLOWED MY JOB MAY BE IN JEOPARDY.

*Acknowledged and Agreed:*

_____
Employee **Printed** Name

_____
Employee **Signature** and Date

Human Resources Department 2009

3. Seek sponsorship for sustainable practices. For example, instead of having plastic disposable water bottles, source a sponsor for reusable water bottles and one for water stations.
4. Have signage at food stations listing the sustainable elements of the meal. For example, using china, bulk condiments, local and organic, etc.
5. Offer a carbon credit option for attendees to offset their travel to the convention. Preferably use a program that benefits the local community.
6. Encourage attendees to inquire further about the sustainable practices of the meeting.
7. Be transparent and straightforward in all efforts!

### *Venues as a Client Resource*

Part of the green meetings program at the Colorado Convention Center is to act as a resource for our clients in implementing sustainable practices for their events. In addition to efficiently operating the building, the web site offers many tools that can be used by planners such as checklist (Figure 3), web site resources, and local green vendor lists.

## RFP/CONTRACTING

For both venues and planners, language reflecting the venue or organization's environmental goals should be incorporated into all Requests for Proposals (RFPs) and contracts, with specified consequences for non-adherence. In doing so, vendors have a clearer understanding of your expectations and goals. The number of RFPs coming to the Colorado Convention Center from potential meeting planners with environmental impact questions has been steadily increasing over the past few years. They range in depth from simple questions regarding waste management practices and energy saving techniques to more in-depth questions requesting diversion rates and data (Figure 3). A venue should also place verbiage in its RFPs reflecting its environmental goals. For example, when the Colorado Convention Center sends an RFP for renovations, language is inserted regarding a contractor's waste management goals. The CCC will then require that the contractor recycle or reuse materials removed as part of the destruction. They also require that materials used meet requirements as outlined in the written procurement policy.

Clients are also beginning to place verbiage in their contracts regarding the statements made by a venue during the RFP process (Figure 4 & 5). A client may require a venue use bathroom paper products with over 40% postconsumer content, or divert a certain percentage of waste from landfills. Coupled with these written demands are monetary penalties such as 5% reduction of rental paid, etc.

## AREAS OF FOCUS

When developing an Environmental Policy, venues and planners generally focus on the following areas of conservation: waste reduction and diversion; energy conservation; water conservation; and air quality. This breakdown of impact areas is similar to LEED and the APEX Green Meeting Standards.

### *Waste Reduction and Diversion*

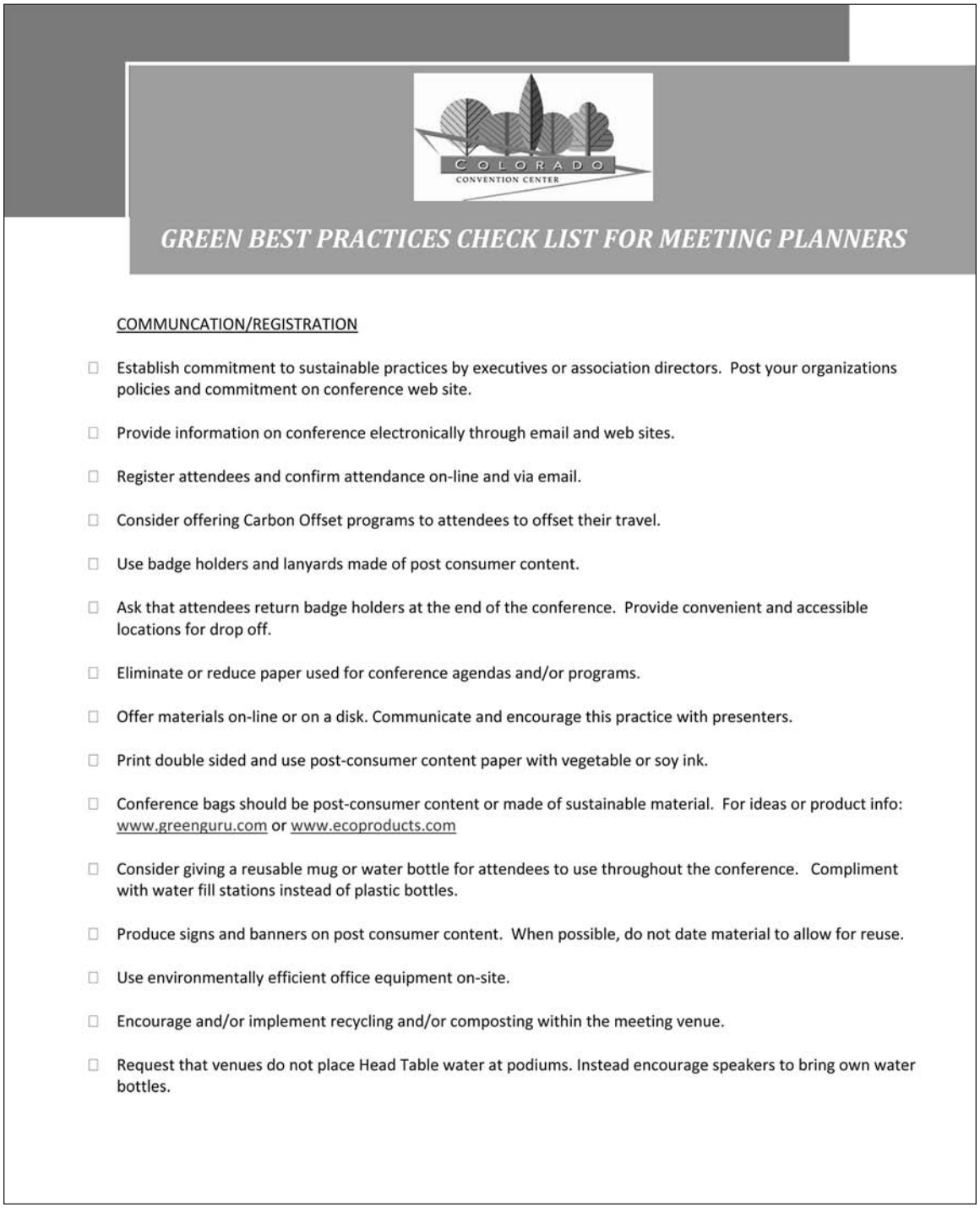
By definition, meetings and events create large amounts of waste as they feed and provide information for large groups of people. According to the planning company, Meeting Strategies World Wide, a typical five-day conference for 2,500 attendees will use 90,000 cans or bottles, 75,000 cups, and 87,500 napkins (Meeting Strategies Worldwide 2003). Multiply this by the tens of thousands of meetings produced internationally, and these figures are staggering. However, there are steps a facility can take to reduce this impact.

#### ***Reduction***

- Serve condiments and beverages in bulk.
- Give option for reusable china instead of disposable ware.
- Encourage reduction of collateral and packaging.
- Reuse banners and signage.
- Use post-consumer content paper and office supplies.
- Use Green Seal Certified (or equivalent) housekeeping products.
- Utilize electronic communication.

Reduction is always ideal when looking at waste production of a facility. By reducing the waste produced, resources and money are saved. Often reduction methods require the participation of both the venue operator and the client, as a venue operator must be willing to offer reduction options such as

**FIGURE 3.** CCC Checklists for Planners, Food and Beverage, Exhibitors.



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## GREEN BEST PRACTICES CHECK LIST FOR MEETING PLANNERS

COMMUNCATION/REGISTRATION

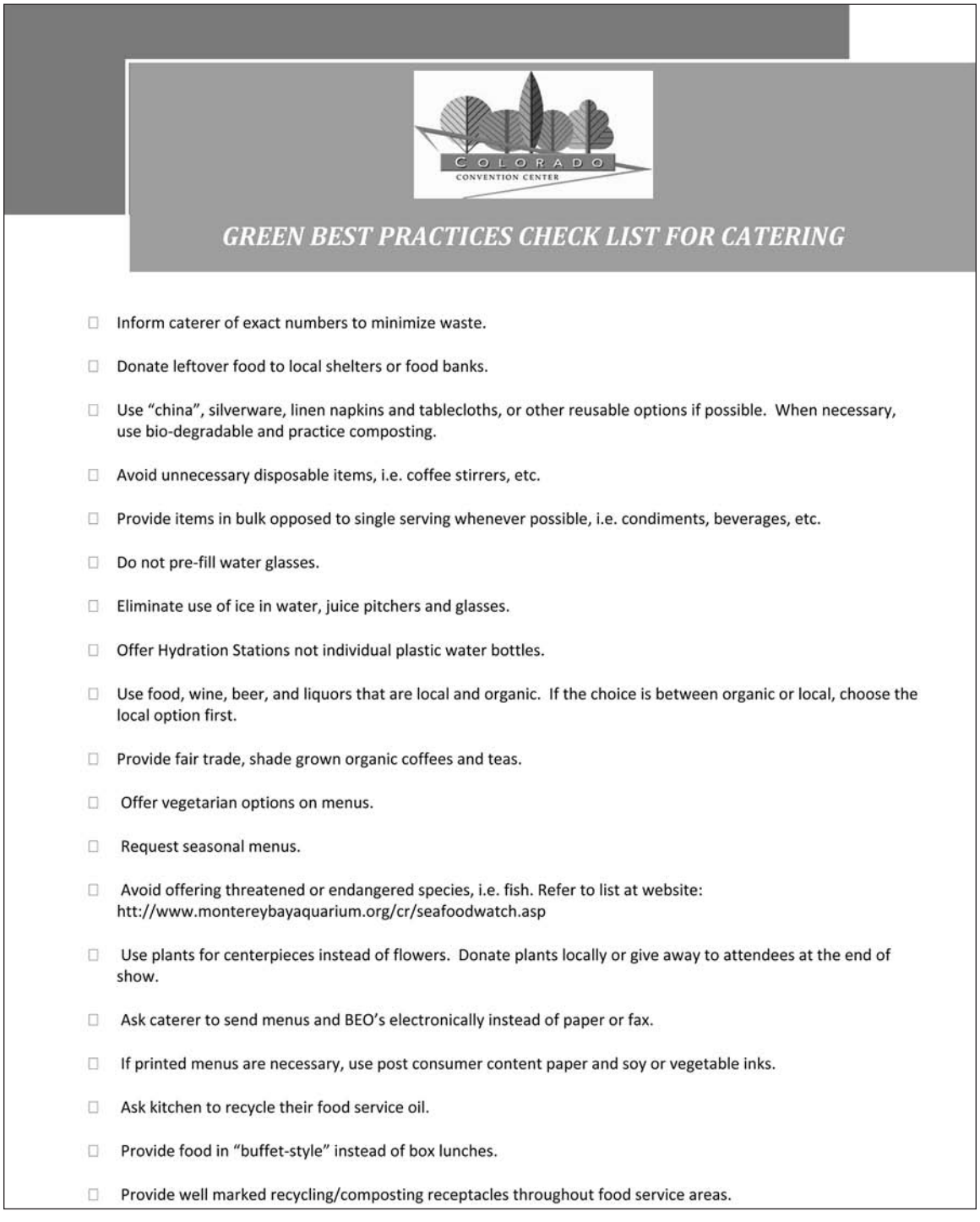
- ☐ Establish commitment to sustainable practices by executives or association directors. Post your organizations policies and commitment on conference web site.
- ☐ Provide information on conference electronically through email and web sites.
- ☐ Register attendees and confirm attendance on-line and via email.
- ☐ Consider offering Carbon Offset programs to attendees to offset their travel.
- ☐ Use badge holders and lanyards made of post consumer content.
- ☐ Ask that attendees return badge holders at the end of the conference. Provide convenient and accessible locations for drop off.
- ☐ Eliminate or reduce paper used for conference agendas and/or programs.
- ☐ Offer materials on-line or on a disk. Communicate and encourage this practice with presenters.
- ☐ Print double sided and use post-consumer content paper with vegetable or soy ink.
- ☐ Conference bags should be post-consumer content or made of sustainable material. For ideas or product info: www.greenguru.com or www.ecoproducts.com
- ☐ Consider giving a reusable mug or water bottle for attendees to use throughout the conference. Compliment with water fill stations instead of plastic bottles.
- ☐ Produce signs and banners on post consumer content. When possible, do not date material to allow for reuse.
- ☐ Use environmentally efficient office equipment on-site.
- ☐ Encourage and/or implement recycling and/or composting within the meeting venue.
- ☐ Request that venues do not place Head Table water at podiums. Instead encourage speakers to bring own water bottles.

**FIGURE 3.** CCC Checklists for Planners, Food and Beverage, Exhibitors *(continued)*.

TRANSPORTATION

- ☐ Choose venues centrally located next to hotels and restaurant.
- ☐ Choose venues accessible by, and encourage, public transportation.
- ☐ If must use busing for attendees, ask that shuttle companies adhere to idling ordinance.
- ☐ Provide directions to event using various public transportation and bicycle routes.
- ☐ Choose local vendors for products when possible to minimize transport and shipping impact.
- ☐ Ask vendors to utilize local inventories and partners.

**FIGURE 3.** CCC Checklists for Planners, Food and Beverage, Exhibitors *(continued)*.



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## GREEN BEST PRACTICES CHECK LIST FOR CATERING

- ☐ Inform caterer of exact numbers to minimize waste.
- ☐ Donate leftover food to local shelters or food banks.
- ☐ Use "china", silverware, linen napkins and tablecloths, or other reusable options if possible. When necessary, use bio-degradable and practice composting.
- ☐ Avoid unnecessary disposable items, i.e. coffee stirrers, etc.
- ☐ Provide items in bulk opposed to single serving whenever possible, i.e. condiments, beverages, etc.
- ☐ Do not pre-fill water glasses.
- ☐ Eliminate use of ice in water, juice pitchers and glasses.
- ☐ Offer Hydration Stations not individual plastic water bottles.
- ☐ Use food, wine, beer, and liquors that are local and organic. If the choice is between organic or local, choose the local option first.
- ☐ Provide fair trade, shade grown organic coffees and teas.
- ☐ Offer vegetarian options on menus.
- ☐ Request seasonal menus.
- ☐ Avoid offering threatened or endangered species, i.e. fish. Refer to list at website: htt://www.montereybayaquarium.org/cr/seafoodwatch.asp
- ☐ Use plants for centerpieces instead of flowers. Donate plants locally or give away to attendees at the end of show.
- ☐ Ask caterer to send menus and BEO's electronically instead of paper or fax.
- ☐ If printed menus are necessary, use post consumer content paper and soy or vegetable inks.
- ☐ Ask kitchen to recycle their food service oil.
- ☐ Provide food in "buffet-style" instead of box lunches.
- ☐ Provide well marked recycling/composting receptacles throughout food service areas.

**FIGURE 3.** CCC Checklists for Planners, Food and Beverage, Exhibitors *(continued)*.

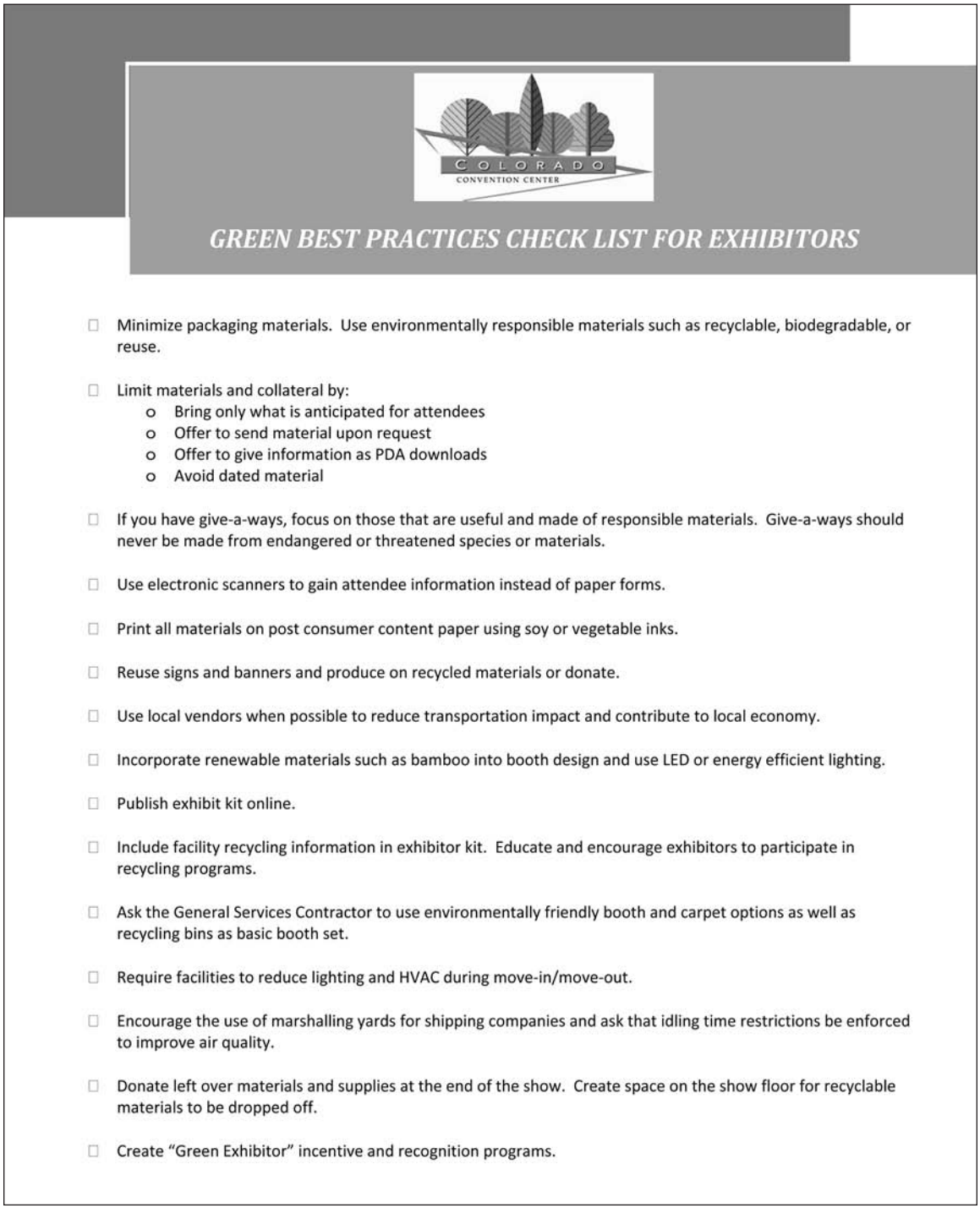


**FIGURE 4.** CCC Contract Verbiage Policy.

**UHG Consulting—Environmental Policies and Procurement**

Steps to ensure compliance with Environmental Policies:

1. Detail environmental requirements in Request for Proposals(attach Environmental Policy, or if no EP exists, another environmental standard);
2. In Representations and Warranties/Obligations § of Contractor Agreement, require that "Work"(usually a defined term) complies with Environmental Policy (or if no EP exists, another Environmental standard);
3. In Representations and Warranties/Obligations § of Contractor Agreement, have a clause stating that Contractor has reviewed and is familiar with the applicable EP;
4. In Representations and Warranties/Obligations § of Contractor Agreement, require Contractor to document all phases of Work;
5. In Event of Default § of Contractor Agreement, specifically enumerate that any violation of the EP constitutes an event of default(and all applicable remedies are available. Remedies are usually defined in a separate generic clause in the agreement);

**§ Representations and Warranties/Obligations**
Contractor hereby represents and warrants that:

(i) Contractor has reviewed and understands the applicable Environmental Policy.
(ii) Performance of Work hereunder shall be in compliance with the Environmental Policy.
(iii) Contractor shall document all phases of performance, including, but not limited to: (a) purchase of materials, (b) demolition, (c) construction, and (d) disposal of materials, to ensure compliance with the Environmental Policy.

**§ Events of Default/Termination**
Each of the following shall constitute and Event of Default:

(i) if any portion of the Work does not comply with the Environmental Policy.

bulk condiments and china and the client needs to be willing to implement and utilize these options. Other practices, such as use of post-consumer content paper, are implemented by the facility or brought in by a client. Unfortunately, not all waste can be avoided and for this waste diversion methods must be established.

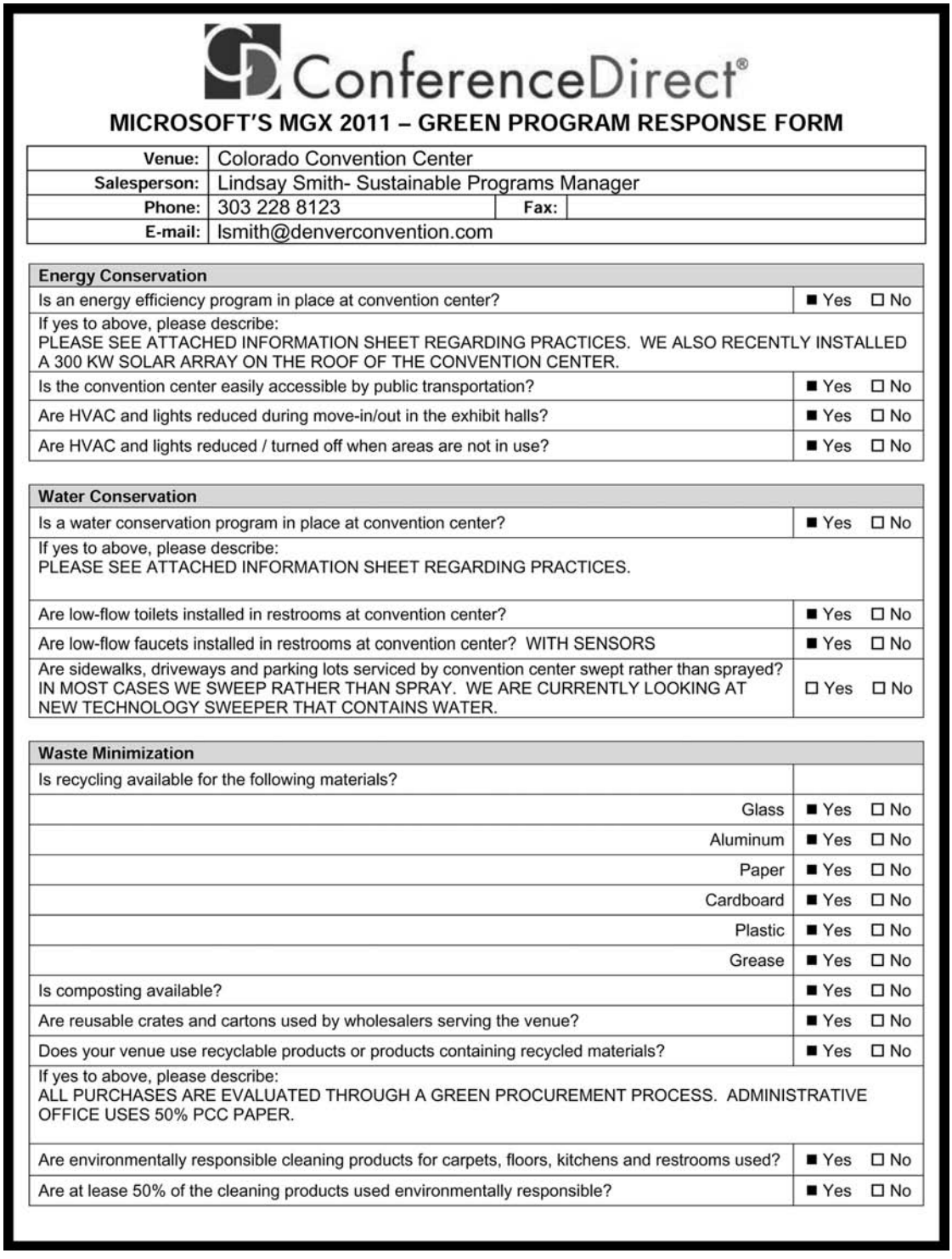
### *Diversion*

- Implement recycling and composting programs.
- Donate leftover food to charities.
- Donate leftover products and materials to charities and schools.
- Recycle batteries, office equipment, light bulbs, oil and other hazardous materials.
- Purchase recyclable or compostable service ware, dependant on programs in place.

Diversion refers to diverting waste from a landfill to other areas for recycling, reuse, or repurpose. The most common waste diversion practice is a recycling program. The impact of implementing a recycling program is significant. However, for truly successful recycling and composting programs, several elements are imperative. The first is that when setting up a station, a recycling bin (and compost bin if applicable) is placed at every location a waste bin is placed. This forces the attendee to make a conscious choice when throwing away his or her trash (Figure 6). However, to avoid contamination and to help the attendee be successful, it is necessary to place signage educating regarding what is acceptable into the different waste streams (Figure 7).

Other areas of diversion include food donation, hazardous materials, office materials, and leftover

**FIGURE 5.** Conference Direct RFP for Microsoft MGX.



ConferenceDirect®

**MICROSOFT'S MGX 2011 – GREEN PROGRAM RESPONSE FORM**

| | | | |
|---|---|---|---|
| **Venue:** | Colorado Convention Center | | |
| **Salesperson:** | Lindsay Smith- Sustainable Programs Manager | | |
| **Phone:** | 303 228 8123 | **Fax:** | |
| **E-mail:** | lsmith@denverconvention.com | | |

| **Energy Conservation** | |
|---|---|
| Is an energy efficiency program in place at convention center? | ■ Yes ☐ No |
| If yes to above, please describe:<br>PLEASE SEE ATTACHED INFORMATION SHEET REGARDING PRACTICES. WE ALSO RECENTLY INSTALLED A 300 KW SOLAR ARRAY ON THE ROOF OF THE CONVENTION CENTER. | |
| Is the convention center easily accessible by public transportation? | ■ Yes ☐ No |
| Are HVAC and lights reduced during move-in/out in the exhibit halls? | ■ Yes ☐ No |
| Are HVAC and lights reduced / turned off when areas are not in use? | ■ Yes ☐ No |

| **Water Conservation** | |
|---|---|
| Is a water conservation program in place at convention center? | ■ Yes ☐ No |
| If yes to above, please describe:<br>PLEASE SEE ATTACHED INFORMATION SHEET REGARDING PRACTICES. | |
| Are low-flow toilets installed in restrooms at convention center? | ■ Yes ☐ No |
| Are low-flow faucets installed in restrooms at convention center? WITH SENSORS | ■ Yes ☐ No |
| Are sidewalks, driveways and parking lots serviced by convention center swept rather than sprayed?<br>IN MOST CASES WE SWEEP RATHER THAN SPRAY. WE ARE CURRENTLY LOOKING AT NEW TECHNOLOGY SWEEPER THAT CONTAINS WATER. | ☐ Yes ☐ No |

| **Waste Minimization** | |
|---|---|
| Is recycling available for the following materials? | |
| Glass | ■ Yes ☐ No |
| Aluminum | ■ Yes ☐ No |
| Paper | ■ Yes ☐ No |
| Cardboard | ■ Yes ☐ No |
| Plastic | ■ Yes ☐ No |
| Grease | ■ Yes ☐ No |
| Is composting available? | ■ Yes ☐ No |
| Are reusable crates and cartons used by wholesalers serving the venue? | ■ Yes ☐ No |
| Does your venue use recyclable products or products containing recycled materials? | ■ Yes ☐ No |
| If yes to above, please describe:<br>ALL PURCHASES ARE EVALUATED THROUGH A GREEN PROCUREMENT PROCESS. ADMINISTRATIVE OFFICE USES 50% PCC PAPER. | |
| Are environmentally responsible cleaning products for carpets, floors, kitchens and restrooms used? | ■ Yes ☐ No |
| Are at lease 50% of the cleaning products used environmentally responsible? | ■ Yes ☐ No |

**FIGURE 5.** Conference Direct RFP for Microsoft MGX *(continued)*.

ConferenceDirect®

| | |
|---|---|
| Are environmentally responsible restroom supplies used? (ie: hand towels, toilet paper) | ■ Yes ☐ No |

| | |
|---|---|
| Do you use biobased or biodegradable products? | ■ Yes ☐ No |
| If yes to above, please describe:<br><br>PLEASE SEE ATTACHED SPEC SHEET REGARDING OUR CLEANING PRODUCTS | |

| **Staff & Vendors** | |
|---|---|
| Is venue staff trained to implement environmental policies? | ■ Yes ☐ No |
| Are vendors required to follow environmentally responsible practices? THEY ARE STRONGLY ENCOURAGED. ANY HIRED DIRECTLY BY FACILITY ARE REQUIRED. | ■ Yes ☐ No |
| If yes to above, please describe:<br>CURRENTLY COMPILING A GREEN VENDOR CHECKLIST. VENDORS ALSO SIGN PLEDGE TO ADHERE TO IDLING ORDINANCE. HAVE ALSO WORKED WITH SOME GSC TO INCLUDE "GREEN EXHIBITOR CHECK LIST" IN THEIR SERVICE KITS. WE REQUIRE VENDORS TO PARTICIPATE IN RECYCLING PROGRAMS AND BANNER RECLAIM PROGRAM. | |

| **Other** |
|---|
| What other environmental initiatives have you undertaken? (please include any environment-related certifications you possess or EPA voluntary partnerships in which you participate?<br><br>Convention Center is EMS ISO 14000 Certified (Environmental Management System);<br>Currently registered and pursuing LEED EB certification;<br>Full time position, Sustainable Program Manager, available to assist clients in their sustainable goals. |

**Signature:** _____ Date: _____

By signing above I approve and agree to all information contained herein.

YOUR RESPONSE WILL NOT BE ACCEPTED WITHOUT THIS INFORMATION

**Please return by Wednesday, November 19th to:**
**Alicia Moneyhun fax: ++425.708.0216 alicia.moneyhun@conferencedirect.com**

**FIGURE 6.** Standard Resource Collection Set at CCC.


event materials and sets. In the past, venues and planners avoided donating food to shelter due to fear of health code violation concerns. Recently "Good Samaritan" laws have been established in many states to help protect venues and planners from litigation.

Local municipalities are also helpful in disposal of hazardous materials such as batteries, light bulbs, and oil. Especially true for city or state owned and/or managed facilities, Environmental Health departments often offer free pick up and disposal of these materials.

Finally, there are many opportunities for donation of leftover materials and collateral. At the Colorado Convention Center, a room has been designated to store materials such as leftover conference bags, shelving, and signage. The facility then works with local charities such as Habitat for Humanity and Resource Area for Teachers (RAFT)[5] to donate and reuse the materials. There are also several companies that are now repurposing unrecyclable vinyl banners into products such as messenger and reusable shopping bags.

The U.S. Environmental Protection Agency has established the program Waste Wise to help organizations track their waste streams and set goals to increase their diversion rates. The program is free and the information tracked is confidential. For more information, visit their web site at www.epa.gov/epawaste/partnerships/wastewise/about.htm.

**FIGURE 7.** Insert CCC Recycle/Trash Sign.


### *Energy Conservation*

Energy cost is often the most significant operation expense for large commercial buildings. Energy is also often one of the areas where the most significant efficiencies can be implemented and savings gained. Convention centers require incredible amounts of energy to heat, cool, light, run escalators, productions, and more. While meeting the needs of the client and attendees take priority, there are steps mechanically and operationally a venue can take to increase efficiency and reduce energy consumption. Sometimes, the simple policy to cut lighting levels to 50% during move-in hours can save a facility hundreds of thousands of dollars in electrical expense annually.

Commissioning of a building is usually the first step in determining areas of focus to reduce energy consumption. The process evaluates a building's current operating plan and identifies changes, modifications, and/or repairs necessary to increase efficiency. Most buildings have a Building Automation System (BAS), which regulates the various systems of the building, such as HVAC and lighting. These

systems are very useful for monitoring and controlling different areas and often work in conjunction with preventative maintenance programs.

The second area of focus for a building to increase efficiency is to evaluate Building Operating practices. Regularly scheduled walkthroughs of the building can raise staff awareness as to when areas are running lights and other systems unnecessarily. Many building operators implement policies that limit the lighting and HVAC levels during unoccupied times.

Finally, many buildings are beginning to explore Renewable Energy options for their buildings. Solar panels and wind turbines are popular sources of energy that are installed on-site. In several instances, such is the case of the recently installed 300KW system at the CCC; outside investors fund the projects to capitalize on the numerous rebates.

***Building Mechanics***

- Install variable speed escalators.
- Install programmable thermostats.
- Install occupancy sensors in administration offices, restrooms, and storage areas.
- Replace lighting fixtures with CFLs, LEDs, or T8 lamps (including all exit signs).
- Install Energy Star® rated "Cool Roof" to reflect solar heat.
- Use variable frequency fan motors.
- Replace old windows with low-e glass to help control temperature fluctuations due to the solar heat or install window film.
- Install alternative energy sources such as photovoltaic panels or wind turbines (Figures 8 & 9).
- Install computer based monitoring system.
- Request energy Audits from Utility companies.

***Building Operation***

- Time HVAC, lighting, and escalators to the event times.
- Reduce lighting levels during move-in and move-out to 50%, and 25% for maintenance.
- Arrange monitoring of doors and roll ups.
- Capitalize on natural lighting when possible.
- Change out filters regularly to keep HVAC systems efficient.
- Require "sleep" mode on admin computers.
- Offer laptops instead of desk computers, which require only 10% energy.
- Create and post Lighting Policies throughout administration areas.
- Purchase only Energy Star® appliances and equipment.

### *Water Conservation*

Water conservation is increasing in importance for many cities. A venue can direct its efforts by reducing water consumption and reducing or preventing discharge of contaminants into the water stream. As with energy, there are often rebates offered by local municipalities for water savings. The partnership between Denver Water and the Colorado Convention Center is a perfect example of a city agency working with a building to implement change and conserve a valuable resource. Recently, the two entities worked together on a couple of projects resulting in a significant reduction of water use at the convention center. The first project occurred in the winter of 2007, in which they replaced over 300 toilets and urinals from 3.5 gallons per flush to 1.5 gallons for toilets, and .5 gallons for the urinals. The result was a savings of 1.6 million gallons of water in the first six months following the installation. A second project was a xeriscape installation in July of 2008 (Figure 10). Native and low water use plants replaced the existing Kentucky Blue Grass. As a result, the area will save nearly 500,000 gallons of water annually to maintain.

Small changes often have significant results when reviewing water management plans. For the bigger items, sponsorship and rebates are often available. Some basic steps for water consumption reduction and contamination prevention are:

***Reduced Water Consumption***

- Install low flow toilets and urinals.
- Regularly check for toilet and sink leaks (replace as necessary).
- Install low flow aerators on sinks with motion sensors.
- Install plants that are native and require low water use for landscape (xeriscape).
- Utilize a low flow irrigation system.
- Employ alternative methods to cleaning sidewalks other than spraying.
- Fill water glasses during functions only upon request.
- Install water fill stations (Figure 10).

**FIGURE 8.** Solar Array Fact Sheet.

# Colorado Convention Center Solar Power System


The Colorado Convention Center is a state-of-the-art facility in the heart of exciting downtown Denver. The convention center is now hosting a landmark renewable energy project, a 300 kilowatt solar power system. Covering 30,000 square feet atop the convention center, this solar array demonstrates Denver's commitment to environmental sustainability.

MMA Renewable Ventures, which financed, owns and operates the system, joined with Oak Leaf Partners to develop an innovative public-private partnership, leveraging tax credits and incentives, to finance this solar power system. This partnership enabled the City of Denver and the Colorado Convention Center to secure clean power generation through a long-term contract known as a power purchase agreement (PPA) – rather than a major capital investment. As a result, the City of Denver and the Colorado Convention Center will benefit from hosting a renewable energy system that is cost-effective from its very first day of operation.

Designed and installed by Namasté Solar, Colorado's leading solar electric company, the 300 kW solar array features 1310 high-efficiency solar panels manufactured by SunPower Corporation, and uses state of the art technology to maximize solar electrical generation.

The Colorado Convention Center solar power installation demonstrates the partnership between Greenprint Denver and the Division of Theatres & Arenas in supporting Mayor John Hickenlooper's commitment to sustainable development.

**FIGURE 8.** Solar Array Fact Sheet *(continued)*.

## Project Information

Number of PV modules: . . . . . **1,310**
Solar system capacity: . . . . . **300 kilowatts**
Project surface area: . . . . . **30,000 sq ft**
Completed: . . . . . **November 2008**

## Technical Specifications

Annual energy output: . . . . . **400,000 kWh**
Power output per PV module: . . . . . **230 watts**

COLORADO CONVENTION CENTER

### Project Partners

Site Host:
**Colorado Convention Center**

Development Partner:
**Oak Leaf Energy Partners**

Owner:
**MMA Renewable Ventures**

Installer:
**Namasté Solar**

Panel Manufacturer:
**SunPower**

Utility:
**Xcel Energy**

MMA Renewable Ventures · oakleaf ENERGY PARTNERS · namasté SOLAR · SUNPOWER · DENVER THE MILE HIGH CITY · Xcel Energy® RESPONSIBLE BY NATURE™

**FIGURE 9.** Solar Array Installation on CCC Roof.

**FIGURE 10.** Xeriscape at CCC.

### *A Case Study: The DNC*

The Democratic National Convention in August 2008 faced the difficult scenario of needing to keep thousands of people hydrated during the peak of summer in an extremely dry climate, while also reducing the number of plastic water bottles being consumed. The solution they created was a collaboration of several entities, including Denver Water, the Colorado Convention Center, and the convention planners. Denver Water engineered custom water fill stations that were able to be installed into the water line at the convention center (Figure 11). Eight stations were made, each fitted with three fill spouts. The stations were installed throughout the center and attendees were given reusable water bottles in their welcome bag that they could fill throughout the entire convention. As an added bonus, the water fill stations have been created and are available for use by future conventions.

**FIGURE 11.** DNC Water Refill Stations.


### *Reduction and/or Prevention of Contaminated Water Stream*

- Organic fertilizers and non-toxic pesticides and herbicides.
- Green cleaning program, focused on using organic, biodegradable or bio-renewable products.
- Evaluate cooling tower water management techniques.

For more information about water efficiency, visit the American Water Works Association web site, Water Wiser at http://www.awwa.org/Resources/Waterwiser. The US EPA has also developed a program that provides information about water efficiency products and practices called WaterSense, www.epa.gov/watersense.

### *Air Quality*

Air quality is very important for the well-being of both the attendees and employees of facilities. However, due to several contributing entities, it is also one of the more difficult environmental impacts to measure, control, and enforce. A venue can make changes to improve the overall air quality both inside the facility and the surrounding area.

Being located in downtown Denver provides many advantages, as well as some disadvantages for the Colorado Convention Center in terms of air quality. Advantages include being in walking distance to over 8,000 hotel rooms and 300 restaurants, as well as being easily accessible by public transportation such as light rail and busses. However, the disadvantages include congestion, local traffic, and idling within confined spaces.

Enforcement of local idling ordinances and establishing marshalling yards for staging of vehicles during move-in/out periods are ways a venue can help improve the air quality surrounding its facility. Additionally, offering alternative transportation options are another opportunity for venues to contribute to improved air quality. The infrastructure of public transportation is expanding in many areas, as well as a rise in bike ridership. Venues and planners can capitalize on both movements by providing bike parking, showers, and information on bus routes on web sites.

Indoor air quality is the other area of focus for venues when establishing policies regarding environmental impact and more often within its ability to control. These include using housekeeping products with minimal levels of particulate contaminants and other potentially hazardous chemicals.

#### *Air Quality—Outdoor*

- Utilize marshalling yards for move-in/out.
- Enforce local idling ordinances.
- Communicate alternative transportation options to attendees and clients.
- Offer free, discounted, or preferable parking options for hybrid vehicles.
- Provide safe bike parking/racks.
- Offer benefits such as free bus passes to employees.
- Purchase hybrid vehicle for security patrol.

#### *Air Quality—Indoor*

- Operate forklifts and other equipment run on butane rather than diesel.
- Install $CO_2$ monitoring devices.
- Use Green Seal Certified or equivalent housekeeping products.
- Use no- or low-VOC paints, carpets, sealants, and adhesives.
- Create an integrated pest management policy that does not use chemicals.

#### *A Case Study: Engine's OFF!*

Recently the Colorado Convention Center was presented with an opportunity to participate in a study with the City of Denver to reduce idling of vehicles, freight trucks, and charter buses (Figure 12). The campaign addressed idling of vehicles surrounding the convention center by focusing on strategies other than fines (Figure 13) to encourage drivers to reduce idling. As a result of the campaign, idling around the convention center was reduced from 81% to 45%.

For more information about indoor environmental air quality, please visit the Indoor Air Quality Association web site at www.iaqa.org.

## METRICS

Metrics are an integral component to a successful program as they provide a measurement of a facility's efforts. These metrics are important for tracking progress, transparency of efforts, demonstrating cost and resource savings, and obtaining additional funding for future projects. Energy consumption, waste diversion, and water use are three basic areas measured to determine a convention center's efficiencies and impact.

In addition to providing useful facility information, metrics for clients are also important in assisting and encouraging better practices. The elements

**FIGURE 12.** Engine's OFF! Case Study.

## Final Summary

PAGE 1

The Emily Griffith Opportunity School recently brought the issue of vehicle idling around the Colorado Convention Center to the attention of the City and County of Denver. The City sponsored research that may lead to new efforts to reduce vehicle idling in this area. Through interviews and onsite observations, BBC Research & Consulting examined vehicle idling around the Convention Center. BBC conducted onsite observations before and after an anti-idling campaign to analyze its success. The ongoing campaign, "Engines Off!" was launched in July, 2008 by GBSM, Inc.

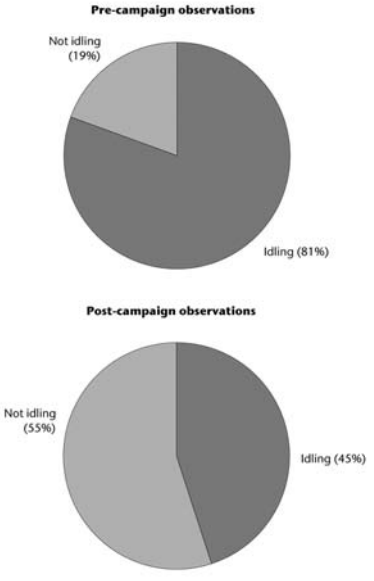
### Analysis of Idling

BBC analyzed driver and vehicle behaviors through onsite observations around the Convention Center area of downtown Denver. A total of 36 onsite observations were conducted by BBC (with 147 vehicles observed). Eighteen pre-campaign observations were conducted from March to May, 2008 and an additional 18 post-campaign observations were conducted from October to November, 2008. Observations lasted from 20 minutes to over one hour.

Temperatures were similar during pre- and post-campaign observations. In both rounds of observations, temperatures ranged from 31 to 82 degrees Fahrenheit. Vehicles observed included semi trucks, delivery trucks, utility trucks, dump trucks, charter buses, public transit buses, shuttle buses and school buses.

Figure 1 compares the percentage of vehicles idling versus vehicles not idling in pre- and post-campaign observations. During the pre-campaign observation visits, a total of 67 large, stationary vehicles were observed. Of these vehicles, 54 (or 81%) of them were observed idling. During the post-campaign observations, a total of 80 vehicles were observed. Of these vehicles, only 36 (or 45%) of them were observed idling. This represents a significant reduction in idling.

**Figure 1.**
**Percentage of Vehicles Idling versus Vehicles Not Idling**




## Final Summary

PAGE 2

During the pre-campaign observations, the driver was present 69 percent of the time when the vehicle was idling. During the post-campaign observations, the driver was present 83 percent of the time when the vehicle was idling.

During the pre-campaign observations, 31 (or 57%) of the idling vehicles were charter buses. Semi trucks and transit buses each represented 15 percent of idling vehicles and delivery trucks represented 5 percent. During post-campaign observations, 14 (or 39%) of the idling vehicles were charter buses. Transit buses represented 31 percent and semi trucks accounted for 14 percent of idling vehicles. Delivery and utility trucks each represented 6 percent of idling vehicles.

Figure 2 compares the percentages of idling times among vehicles observed idling in pre- and post-campaign observations. During the pre-campaign observations, 24 percent of vehicles observed idling remained idling for less than five minutes; another 26 percent of vehicles observed idling remained idling for between five and ten minutes; and 50 percent of vehicles observed idling remained idling for more than 10 minutes (and 56% of these vehicles were observed idling for more than 30 minutes).

During the post-campaign observations, 69 percent of vehicles observed idling remained idling for less than five minutes; another 11 percent of vehicles observed idling remained idling for between five and ten minutes; and only 19 percent of vehicles observed idling remained idling for more than 10 minutes.

**Figure 2.**
**Percentage of Vehicle Idling Time**

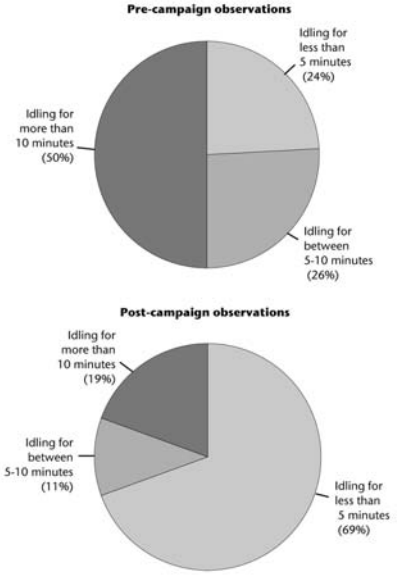


**FIGURE 12.** Engine's OFF! Case Study *(continued)*.

## Final Summary

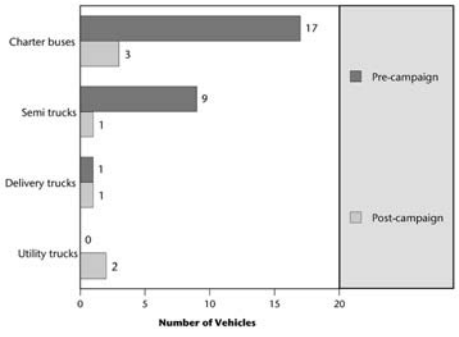
PAGE 3

Figure 3 compares the number of and types of vehicles that were observed idling for more than 10 minutes in pre- and post-campaign observations. In pre-campaign observations, of vehicles observed idling for more than 10 minutes, 17 (or 63%) were charter buses and 9 (or 33%) were semi trucks. Although only a small percentage of vehicles were idling for more than 10 minutes in post-campaign observations, the biggest offender continues to be charter buses, which represent 3 (or 43 %) of the vehicles idling more than 10 minutes.

### Caveats

These results only reflect idling behavior during selected days from March to May, 2008 and October to November, 2008 (BBC over-sampled event days). Results would differ if the days of observation were randomly-sampled for March to May and for October to November. Because the post-campaign selection strategy for observations was parallel to the pre-campaign selection strategy, BBC is able to generally compare results but is not be able to perform tests of statistical significance of any pre- versus post-campaign differences.

**Figure 3.**
**Number of Vehicles Idling More than 10 Minutes**




## Final Summary

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### Interviews

In addition to the onsite observations, BBC conducted 18 interviews during the pre-campaign observations, including telephone and intercept interviews (The BBC work scope did not include post-campaign interviews). Telephone interviews were conducted with groups that could contribute to or impact idling behaviors. Interviewees included the security manager of the Convention Center; destination management companies (DMCs); charter companies; and vendors associated with the Convention Center. BBC conducted intercept interviews with bus and truck drivers parked or idling around the Convention Center and with two Denver police officers. Key points from interviews include the following:

- Large and concentrated idling problems usually occur during particular shows at the Convention Center. As many as 10 to 30 buses at a time may be parked (and potentially idling) around the Convention Center.
- DMCs said they did have some responsibility to promote any policy of the Convention Center, but they did not think that they should be responsible for enforcing it.
- Three out of four charter companies interviewed said drivers are only allowed to leave the bus idling during "extreme weather." One company said drivers are permitted to leave the engine idling "at all times."
- Drivers interviewed around the Convention Center generally reported that it was wasteful to idle a bus or truck for an extended period of time.
- When asked if the police do anything to enforce the City's idling ordinance, the officers interviewed said that they do not.

### Findings from Pre-Campaign Observations

Preliminary research during pre-campaign observations suggested:

- Awareness of the City's idling ordinance, despite existing Convention Center signage and communications, is low.
- Motivation to reduce idling is limited.
- Communication is a complicated task requiring duel channels: "top-down" and "bottom-up."
- Compliance with the City's idling ordinance is low.

### Findings from Post-Campaign Observations

The research from post-campaign observations suggests:

- Fewer large vehicles are idling around the Convention Center.
- Vehicles that are idling are idling for less time.
- Compliance with the City's idling ordinance has increased.

A summary table of pre-campaign observations is provided in Figure 4, and a summary table of post-campaign observations is provided in Figure 5 on the following pages.

**FIGURE 13.** Engine's Off! Signage.


tracked by a planner may vary based on the goals and intentions of the event; however, there are some that are more easily tracked than others. In general, a facility should be able to provide a client with its event's energy use, waste diversion, and carbon footprint. As mentioned previously, some planners are beginning to include tracking of these metrics in their contracts.

When working with a client, it is important to determine the depth of measurement prior to the event as this helps shape the event's green program. For example, when looking at energy consumption, do you simply include venue energy use or do you also include exhibitor and production energy use? Some of these decisions will be determined by the capability of the venue. However, in general, an estimate for energy use based on contracted space and length of event can reasonably be determined by a venue's electric or engineering department. The ability to provide more data may vary with different municipalities; however, a planner should be able to ask the contracted venue contact to help in gathering this information. Once the energy consumption is determined, the facility and/or planner may then decide to purchase renewable energy offsets for all or part of the event's energy consumption.

Waste diversion is another metric that is essential to track when establishing sustainable practices. It is widely known that events and meetings produce large amounts of waste. Therefore, a recycling and/or composting element is critical to every sustainable program. This is also an element of measurement most often asked about by attendees and other stakeholders. Full facility events can easily track the amount of waste produced by their event as they are the only group producing waste during the contracted time; therefore, a facility simply provides the weight of its various compactors. However, smaller events may experience more difficulty singling out their waste, making it necessary to either contract separate waste compactors or develop other methods of weighing each bag. Coordinate with each venue to establish the most effective method within each operation.

A third metric to track and one necessary for those wishing to consider themselves "carbon neutral," is an event's carbon footprint. There are several calculators developed to assist with determining this impact. *Visit Denver*, formerly the Denver Convention and Visitor's Bureau, recently launched a carbon calculator on their web site, www.denver.org/convention/green/carbon-calculator.[6] This calculator is available and free for anyone's use. A planner can determine the carbon footprint of an event overall, and attendees can track their individual footprint of traveling to the conference. With this information, an event or attendee can then purchase carbon offsets equivalent to individual carbon output either through the site or a program of choice. However, the biggest challenge of carbon offset tracking is answering the question of how to thoroughly track the carbon produced by an event. The planner can be bogged down with issues such as: Do you measure an exhibitor's airplane travel? What about the carbon produced by shipping the production equipment? Hotel room emissions? The potential for carbon tracking is endless and as a result, a planner may be set up for criticism by claiming to produce a "carbon neutral" event. In addition to the difficulty identifying all aspects of carbon as they relate to an event, there is the difficulty in ensuring a project is verifiable. However, these projects do exist and more companies are beginning to demonstrate their credibility. For example, the Colorado Carbon Fund is a program managed within Colorado's Governor's Energy Office, which funds carbon reduction projects in Colorado. Working with the Colorado Carbon Fund is a nice option because it is managed by a governmental agency, and a planner can verify that the off-

sets his company is buying are contributing positively to the location the meeting is impacting.

An example of a high profile event that worked towards"carbon neutrality" was the Democratic National Convention held in Denver in August 2008. A team was established within the local Convention Greening Initiative to achieve this objective. Their goal was to understand and measure the carbon of the event while also working toward carbon prevention. In an attempt to track delegate carbon production, the planners offered the "Delegate Carbon Challenge." The challenge asked that all the delegates from each state offset their carbon produced by attending the convention. If all delegates participated, then that state received special recognition. The challenge not only brought awareness to the greening efforts of the planners, it also raised awareness amongst the delegates regarding their impact by traveling. Finally, for the inevitable carbon produced by the convention itself, the DNC Host Committee sought sponsors to buy carbon offsets.

## CONCLUSION

In conclusion, one of the biggest examples of the industry responding to the increased awareness and expectations regarding these practices from clients, vendors, and governmental agencies, is the creation of the Green Meetings Standards. The standards are being developed on a consensus based process consisting of members from the US EPA, vendors, venues, meeting planners, and other various stakeholders and end users. The standards focus on the following nine industry sectors: audio visual; accommodations; communication; destination; exhibits; food and beverage; meeting venue; on-site office; and transportation. These standards can be used individually by each sector or as a whole for an event.

In addition to the creation of standards, associations such as the Green Meetings Industry Council (GMIC),[7] are forming to serve as a tool, resource, and educator with regards to green meeting practices. Memberships in these associations are growing at astonishing rates as the energy and awareness surrounding new initiatives increases.

All things considered, the most basic key to success is determining realistic goals. It is important to not become overwhelmed by implementation of new practices when you are getting started. Instead, view the process as ever evolving. Introduce new elements of sustainability as resources become available and technologies improve that meet specific needs and goals. If a certain practice was unsuccessful or unpopular, look at it as a learning opportunity and remove or modify. The important thing as a venue operator or event planner is that you are making first steps, tracking your efforts, and making goals for the future. Together, as an industry, we are redefining what it means to produce green meeting and events within efficient facilities!

## NOTES

1. Lindsay Smith, Sustainable Programs Manager, Colorado Convention Center, 700 14th Street, Denver, Colorado, 80202; t: 303 228-8000; c: 206 962-1754; e: lsmith@denverconvention.com.
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3. Content and research contributed by Adam Maxwell, UGH Consulting, Boulder, Colorado.
4. Rocky Mountain Green Venues Partnership Charter, 2009.
5. RAFT Resource Area For Teaching; www.raft.net.
6. Visit Denver; www.denver.org/convention/green/carbon-calculator.
7. Green Meetings Industry Council; www.greenmeetings.net.