

# AZA GREEN GUIDE

Building and Measuring Zoo & Aquarium  
Sustainability Plans

VOLUME 2



CREATED BY

AZA Green Scientific Advisory Group

AZA Conservation & Science Department



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### **AZA Conservation & Science Department Staff Authors and Editors:**

Deborah Luke, Ph.D., Vice President, Conservation and Science  
Rebecca Greenberg, Program Assistant, Conservation and Science  
Maya Seaman, Intern  
Alex Shimm, Intern  
Felicia Spector, Intern  
Arslan Ahmad, Intern

### **Significant Contributors:**

[Jennifer Hale](#): (Chair) Director of Safety and Sustainability, Denver Zoo  
[Doug Piekarz](#): (Vice Chair): VP, Planning and Conservation Programs, Akron Zoo  
[Michelle Parker](#): (Past Chair): Director of Sustainable Practices, John G. Shedd Aquarium  
[Meg Matthews](#): (former) Manager of Conservation Communications, John G. Shedd Aquarium  
[Ruth Allard](#): (CEC Liaison) EVP, Conservation and Visitor Experiences, Phoenix Zoo  
[Mark Fisher](#): Sr. Director of Facilities, Planning and Sustainability, Cincinnati Zoo and Botanical Garden  
[John Garner](#): Conservation & Education Manager, Point Defiance Zoo & Aquarium  
[Julie Henry](#): Director, Conservation Enterprises  
[Barbara Long](#): Vice President, Aquarium of the Pacific  
[David McGuire](#): VP, Architecture and Planning, St Louis Zoo  
[Mark Plunkett](#): Conservation Manager, Seattle Aquarium  
[Aaron Pope](#): Manager of Sustainability Programs, California Academy of Sciences  
[Mary Joan Pugh](#): Deputy Director, North Carolina Zoo  
[Beth Stark-Posta](#): Curator of Behavioral Husbandry and Research, Toledo Zoo  
[Chris Waldron](#): (former) Sustainable Operations Manager, Philadelphia Zoo

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## Introduction

The Association of Zoos and Aquariums (AZA) is concerned about species survival and ecosystem health and is therefore dedicated to making substantial positive impacts for their conservation. AZA-accredited zoos and aquariums serve as conservation centers that make significant contributions towards sustainable practices, field conservation, research, and informal educational programming, and provide society the opportunity to develop personal connections with the animals in their care.

Sustainable business operations are becoming the “new normal” in corporate America, not only for their financial benefits, but also due to stakeholder demand. As trusted conservation leaders, zoos and aquariums understand that conservation of wildlife requires the conservation of natural and man-made resources; therefore, business operations should incorporate sustainable practices that conserve these resources, save money, and demonstrate the proverbial idea that “Conservation Begins at Home”. Zoos and aquariums that publicly demonstrate their commitment to wildlife conservation by “walking the talk” model ways in which guests can learn how to become part of the solution for many of the environmental problems at the root of the current extinction crisis.

Volume 2 of the AZA Green Guide, entitled “Building and Measuring Zoo & Aquarium Sustainability Plan”, is a living document that is updated as new information becomes available. Specific terms, highlighted in bold italics, are defined in the glossary. Designed to help zoos and aquariums implement, achieve, and document their ***Sustainability Plan***, this Guide introduces several AZA Smart Source Cooperative Purchasing Programs - which allow members to benefit from group discounts on sustainable products and services – and identifies a detailed collection of zoo- and aquarium-related specific ***sustainable practice strategies***, categorized by the sustainability topic areas defined for the [AZA Green Award](#). These topic areas include:

- Awareness
- Chemical Management
- Construction
- Energy Management
- Fuel Management
- Innovation
- Purchasing
- Waste Management
- Water Management

In addition, zoos and aquariums will be able to document their progress on categorical metrics through checklists provided at the end of this Guide. These checklists, provided for each sustainability topic area, are modeled after the ICLEI-Local Governments for Sustainability USA’s successful Green Business Challenge Program but modified to fit the needs of zoos and aquariums. The metrics and checklists are designed to help each organization document its sustainable practices internally via a point system and track its progress against its own operation over time.

Beginning in September 2013, AZA will distribute an annual Sustainable Practices survey to its membership that will gather data from these checklists. This information will, in turn, be used to promote the membership’s individual and collective sustainable practice efforts (in addition to field conservation, research, and educational programming efforts) via the AZA Annual Report on Conservation and Science (ARCS). The newly refined ARCS will allow AZA to be better able to share the story of how accredited zoos and aquariums are leaders in wildlife conservation. Whether they are saving species from the brink of extinction or ensuring species never reach such a precarious state by mitigating environmental threats, AZA-accredited zoos and aquariums are working hard to protect wildlife and wild habitats for future generations to enjoy.

## Planning

All AZA-accredited zoos and aquariums are encouraged to implement a Sustainability Plan, which serves as a critical starting point for staff to support the organization's sustainable practice strategies and contributes to the Plan's success. Staff should be urged to read both AZA Green Guides, visit the AZA Sustainable Practices webpage (<http://www.aza.org/sustainable-practices/>), and contribute their ideas to further develop these resources. The Sustainability Plan also provides a tangible roadmap that can be used to communicate or increase awareness of the zoo or aquarium's Plan to gain further support from visitors, vendors, and the community.

Volume 1 of the AZA Green Guide, entitled "Introduction to Building Zoo & Aquarium Sustainability Plans" provides a basic understanding of sustainable practices, helps zoo and aquarium professionals become fluent in the language of sustainability, and communicates ways to begin thinking about and developing a comprehensive Sustainability Plan. General information included provides guidance on ways to start thinking about how to establish a **Green Team**, create a **Sustainability Mission Statement** and/or **Sustainability Vision Statement**, quantify operational baselines, prioritize sustainable practice strategies, and develop a dynamic Sustainability Plan. This Guide provides greater detail for each of these areas that are presented in easy to follow bullet point recommendations.

### Green Team

The Green Team should:

- be composed of personnel ranging from upper-level managers to representatives from all departments, particularly those that are interested and/or already engaged in sustainability efforts and serve the different topic areas defined in this Guide.
- be responsible for creating a sustainability mission and/or vision statement, quantifying operational baselines, prioritizing sustainable practice opportunities and strategies, measuring outcomes, and developing a dynamic Sustainability Plan to meet the needs and strengths of the zoo or aquarium.
- establish and communicate clearly defined roles and responsibilities for its individual members.
- receive management support and be held to the same standards as other operational teams and have decision-making authority, or report to someone that has decision-making authority.
- schedule routine meetings, at least quarterly, to ensure selected sustainable practice strategies are well coordinated and implemented across all departments.
- develop an internal communications plan to provide and receive clear and consistent communication with staff.
- develop an external communications plan to provide and receive clear and consistent communication with visitors, vendors, and the community.
- identify an individual who will be responsible for completing the annual AZA Sustainable Practices Survey.
- determine ways to invest the financial savings incurred from the prior implementation of sustainable practice strategies into the following year's strategies.

### Sustainability Mission Statement

A Sustainability Mission Statement should describe what your zoo or aquarium wants for the present and incorporate input from staff within all departments when being developed. A zoo or aquarium

Sustainability Mission Statement should identify:

- your current sustainability needs.
- your current sustainability values.
- your broad goals for sustainability.
- what makes your sustainability focus unique.
- what you're currently doing for sustainability.
- the key measures being used to reach your goals.

## Sustainability Vision Statement

A Sustainability Vision Statement should describe what your zoo or aquarium wants for the future and incorporate input from staff within all departments when being developed. A zoo or aquarium Sustainability Vision Statement should identify:

- what your sustainability focus aims for in the future.
- what your sustainability plans are for the future.
- ways to inspire others to give their best.
- an understanding of why work in this area should continue
- how you will achieve these future plans.

## Quantify Operational Baselines

In order to reach a destination, it is necessary to know your starting point; this is the essential idea of quantifying an operational baseline. The idea of using a known and defined point of reference is commonplace and is central to an effective management process. If it can't be measured, it can't be managed - what gets measured gets watched – and what gets watched gets done. Operational baselines should:

- be determined for sustainability-related practices, products, or services that can be measured through specific inventories.  
*Helpful Hint:* This is explained further in each topic area
- be a well-defined, well-documented reference about resource usage and cost that serves as the foundation for future assessment.
- document the monthly **unit usage amounts** (or generation/discharge amounts) and associated **dollar spent amount** spent over the past 12 months in each of the topic areas.  
*Helpful Hint:* This can typically be obtained from reviewing the monthly bills.

## Prioritize Sustainable Practice Opportunities & Strategies

There are several considerations that should be taken into account when prioritizing and selecting the Sustainable Practice Strategies that will be included in the Sustainability Plan. It is not necessary to try to address everything at once and the information gained from quantifying the operational baselines is vitally important to identifying three or four of the most feasible Strategies that can be implemented with little or zero cost to the zoo or aquarium. As progress is measured and assessed over time, additional Strategies can be incorporated into the Plan as it evolves. To determine which Sustainable Practice Strategies should be incorporated into your Sustainability Plan:

- use the checklists found at the end of this Guide to see a detailed listing of many options, but feel free to add new Strategies as needed.
- solicit the expertise of employees in each department to recommend which Sustainable Practice Strategies are the most obtainable.
- determine which Strategies your zoo or aquarium is already implementing, document the year initiated on the corresponding scorecard, and move on to other Strategy options.
- prioritize Strategies that are required or regulated (Federal, State or local).
- determine which Strategies that make the most sense to incorporate given your zoo or aquarium's needs and strengths.
- identify Strategies that will help leverage buy-in of the Sustainability Plan by the staff, visitor, vendors, and the community.
- determine which Strategies will have the greatest level of positive environmental, economic, and social impact.

## Develop and Maintain a Dynamic Sustainability Plan

The development and maintenance of a dynamic Sustainability Plan is important as it communicates the ways in which the zoo or aquarium will meet its Sustainability Mission and/or Vision and provides a detailed roadmap to guide employees, visitors, suppliers, and the community in positive steps forward.

There are five steps to maintaining a dynamic Sustainability Plan:

1. Conduct inventories to quantify and document the monthly **unit usage amounts** (or generation/discharge amounts) and associated **dollar spent amount** within one or all topic areas over the past 12 months.
2. Identify which Sustainable Practice Strategies are already met in each topic area and indicate the year initiated on the corresponding scorecard.
3. Select which new Sustainable Practice Strategies will be implemented for the current Sustainability Plan year.
4. Tally and compare the unit usage and dollar spent amounts from those at the beginning - to those at the end - of the Sustainability Plan year to assess progress.
5. Repeat Steps 3 and 4 annually!

To have a more robust Sustainability Plan, many zoos and aquariums commit to investing the annual dollar amount saved directly into the following year's Sustainable Practice Strategies. Setting clear expectations that this annual dollar amount saved is earmarked for further sustainable practices is a key step towards moving your efforts forward at a progressive pace.

Within the Sustainability Plan itself, an introduction should be included that clearly articulates the responsibilities of the Green Team, identifies all members of the Green Team and stipulates their responsibilities, provides a Sustainability Mission Statement and/or Sustainability Vision Statement, and ties your Sustainability Plan to your zoo or aquarium's overarching Mission Statement and Strategic Plan. The Sustainability Plan should then identify goals that are specific, measurable, attainable, realistic and timely (SMART). Each goal should identify the Sustainable Practice Strategy that is targeted, the person responsible for championing the goal, the team of individuals assigned to work on the goal, the baseline data that will be used to measure progress, a completion timeline, and a budget (if necessary).

<b>Sustainability Goal1:</b>	<b>Identify an overarching sustainability goal that addresses a specific need or strength of your zoo or aquarium.</b>
Sustainable Practice Strategy:	Identify the Sustainable Practice Strategy(ies) that will be implemented to make progress on this goal.
Champion:	Identify an individual who will be responsible for championing this goal and reporting progress.
Team:	Identify the individual or team of individuals assigned to work on this goal.
Baseline/Annual Data:	Conduct inventories to determine unit usage and dollar spent amounts to be used as a point of reference when assessing progress in the future.
Timeline	Identify a realistic timeline for assessing and completing the individual Sustainable Practice Strategy(ies) and this goal.
Budget	Identify which budgetary needs are required to meet this goal and project any financial savings that will result when this goal is accomplished.

Assessment and reporting periods should be consistent with the time phasing of the Sustainability Plan, typically on an annual basis. The AZA annual sustainable practices survey will be distributed each September and closed the following February 28<sup>th</sup> so zoos and aquariums have ample time to report progress that will be included in the Annual Report on Conservation and Science.

## Specific Recommendations for Sustainability Topic Areas

This chapter provides specific recommendations that can be used to conduct inventories and thereby determine operational baselines and future assessments, incorporate topic area information into your Sustainability Plan, and select which Sustainable Practice Strategies will be implemented each year. Zoos and aquariums are encouraged to give consideration to these recommendations as they implement their Sustainability Plan.

### Awareness

To increase awareness and support of the zoo or aquarium's Sustainability Mission, Vision, and/or Plan, transparent and consistent communication should be maintained with employees, visitors, suppliers, and the community. Information should include success stories as well as identify challenges that have been encountered. These types of communication will provide direction and context for individuals to participate and can inspire problem-solving feedback that may contribute to goal accomplishment.

### Internal Communication:

- Management should provide support for the Green Team and the implementation of a Sustainability Plan.  
*Helpful Hint:* Management should integrate the time and resources needed into for staff to serve on the Green Team; implement sustainable practice strategies; and include progress on sustainability goals in staff performance appraisals whenever appropriate.
- Management should require that all staff attend regularly scheduled Sustainability Meetings.  
*Helpful Hint:* These meetings should increase staff literacy on all sustainability topic areas defined in this Guide as they relate to your zoo or aquarium; introduce the members of the Green Team and articulate their responsibilities; summarize the Sustainability Plan's goals and expectations; identify what sustainable practice strategies will be implemented in the workplace; highlight staff members, teams, or departments that helped champion efforts; and identify a process to gather sustainable practice ideas and feedback from staff on a regular basis.
- The Green Team should schedule routine meetings to ensure selected sustainable practice strategies are both well coordinated and actively implemented across departments.
- The Green Team should develop a communications plan that will consistently promote your zoo or aquarium's sustainable practice efforts and accomplishments internally to staff throughout the year.  
*Helpful Hint:* This can be done using various delivery methods such as staff newsletters, posters in staff areas, and in staff meetings, etc.
- The Green Team should compose an **Annual Sustainability Report** that is transparent and promotes the zoo or aquarium's efforts.  
*Helpful Hint:* Content can include a summary of the scorecard strategies your organization selected and/or implemented in each topic area; provide a comparison of the year's annual chemical, energy, fuel, waste, and water unit usage and dollar spent amounts; highlight staff who have made significant and key efforts; and be distributed to all staff and the Board of Directors as well as published on your website and in your Annual Report.

### External Communication:

- Ensure that public messaging cannot be interpreted as **greenwashing**.
- Use framing strategies that identify clear **causal chains** to communicate your organization's sustainable practices to guests.  
*Helpful Hint:* This can be accomplished through interpreters, exhibit graphics, website pages, newsletters, social media, and special events (e.g., Earth Day).
- Create signage that delivers key sustainability messages to the public, in addition to training educators/interpreters to help spread this information.  
*Helpful Hint:* Frame messages to emphasize how the conservation of wildlife requires the conservation of natural and man-made resources. Highlight key areas your organization is making towards these efforts and provide examples of how visitors can "Engage Change" and



- gain an understanding that “Conservation Begins at Home”.
- Publicly recognize key sustainability efforts made by staff within each department on a consistent basis.  
*Helpful Hint:* This can be done using various delivery methods such as member newsletters and meetings, website, social media, etc.
- Integrate sustainability practices into all public programming and events and provide signage promoting these efforts.  
*Helpful Hint:* This can be accomplished in a variety of ways such as using reusable, corn-based, or biodegradable dishes, cups, and utensils; using tap water rather than bottled water, etc.
- Provide mechanisms for guests to successfully achieve or replicate the sustainable practice efforts you promote.  
*Helpful Hint:* This can be accomplished in a variety of ways such as ensuring recycling bins are available for guests throughout the park if promoting recycling success stories; only selling palm oil-free candy in your gift shops if promoting palm oil conservation; only serving sustainable seafood in your restaurants if asking guests to purchase sustainable seafood, etc.
- Partner with external conservation organizations to expand your reach through a collaborative effort.  
*Helpful Hint:* Collaborations can be used to further educate your guests about how the conservation of wildlife requires the conservation of natural and man-made resources; start an Arctic Ambassador Center in partnership with Polar Bears International, join Sea Food Watch, and connect with other sustainability oriented organizations...)
- Coordinate consistent sustainability-related community involvement projects, programs, events, and activities.  
*Helpful Hint:* Community involvement should be used to further educate your guests about how the conservation of wildlife requires the conservation of natural and man-made resources; Manage events such as Bicycle to Zoo, stream cleanups; coordinate events with nationally recognized days such as Earth Day, World Ocean Day, etc.
- Assign a representative of the Green Team to complete the annual AZA Sustainable Practices survey so that progress on your zoo or aquarium’s sustainable practices will be included in the AZA Annual Report on Conservation and Science (ARCS).

### **Awareness Resources:**

Aspen Global Change Institute (<http://www.agci.org/>): Is dedicated to furthering the scientific understanding of Earth systems and global environmental change through interdisciplinary scientific workshops, educational programs, and publications and videos.

Climate Communication (<http://climatecommunication.org/>): This site focuses on what is happening to our climate, how it will affect us, and what we can do.

Climate Interpreter (<http://www.climateinterpreter.org/>): This site allows zoo and aquarium professionals to learn about climate change as well as collaborate and communicate with others.

*Environmental Science for Dummies* by Alecia Spooner

(<http://www.dummies.com/store/product/Environmental-Science-For-Dummies.productCd-1118167147.html>): This book simply explains how organizations can act as environmental stewards and elaborates on the three spheres of sustainability that should be considered to do so.

Framing eWorkshop (<http://sfa.frameworksinstitute.org/>): This link offers a free webinar entitled “Changing the Public Conversation on Social Problems: A Beginners Guide to Strategic Frame Analysis”.

FrameWorks Institute (<http://www.frameworksinstitute.org/>): Their mission is to advance the nonprofit sector’s communications capacity by identifying, translating and modeling relevant scholarly research for framing the public discourse about social problems, including climate change.

*Good to Great* by Jim Collins ([http://www.jimcollins.com/article\\_topics/articles/good-to-great.html](http://www.jimcollins.com/article_topics/articles/good-to-great.html)): The AZA Green SAG recommends the perspective in this book and strongly encourages all AZA organizations to set “Big Hairy Audacious Goals” when creating or expanding their Sustainability

Plan.

The Six Sins of Greenwashing ([http://cms3.tucsonaz.gov/files/ocsd/6\\_sins\\_Terrachoice.pdf](http://cms3.tucsonaz.gov/files/ocsd/6_sins_Terrachoice.pdf)): A study of environmental claims in North American consumer markets.

Tools of Change (<http://www.toolsofchange.com/en/topic-resources/climate-change/>): This site offers specific social marketing tools, case studies, and a planning guide for helping people take action and adopt habits that promote health, safety, and/or sustainability.

United States Global Change Research Program (<http://www.globalchange.gov/what-we-do/assessment>): This site provides a report that summarizes the current and projected impacts of climate change in different regions of the U.S. It includes various aspects of society and the economy such as energy, water, agriculture, and health and is written in plain language, with the goal of better informing public and private decision making at all levels.

## Chemical Management

Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that deliberately reduce or eliminate the use or generation of hazardous substances. Green chemistry applies across the life cycle of a chemical product, including its design, manufacture, and use. Zoos and aquariums are end users of many chemicals, ranging from cleaning products to water treatment additives. Recognizing the impact of the chemicals we choose to work with, and seeking less hazardous products where possible, helps keep our waterways and environments clean.

### Chemical Inventory:

1. Ensure that the Green Team conducts a complete Chemical Inventory that assesses your organization's current collective chemical usage and management strategies on a consistent basis (at least annually).
2. Identify all chemicals used onsite, describe how each is used across the organization and by outside contractors, elaborate on how each is managed, handled, stored, and disposed of (including spill and cleanup protocols), and explain how each could become an environmental hazard.
3. Quantify the current unit usage amount of chemicals your organization uses, and the costs associated with each.
4. Document the purchasing practices, including vendor information, for each chemical used onsite.

### Incorporation into your Sustainability Plan:

1. Outline your organization's view on, and current best practices for, controlling onsite chemical usage, chemical pollution prevention, and using green chemical alternatives.
2. Review, edit, and include current policies or contracts your organization may have regarding chemical management (e.g., hazard communication, contract language with vendors, etc.).
3. Include the Chemical Inventory and use it to assess the organization's current collective chemical usage and management strategies.  
*Helpful Hint:* Ensure that all departments are included in the inventory (e.g., custodial, cafeteria, maintenance, etc.), and that all chemicals related to these departments are included (e.g., pesticides, fertilizers, de-icers and salts used for grounds maintenance; paints, solvents, degreasers, and lubricants used for building operation and maintenance; oils, fuels, and antifreeze used for automobiles, trains, golf cart maintenance; chlorine, sodium thiosulfate, hydrochloric acid, sodium bisulfate for water treatment, etc.).
4. Evaluate and provide examples of ways each chemical can be reduced in quantity, switched to a more sustainable alternative, or eliminated entirely.
5. Identify which chemical management-related sustainable practice strategies your organization will implement to reduce your chemical unit usage amount in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual chemical unit usage amount, and related dollar amount spent, to track trends.

### Sustainable Practice Strategies for Chemical Management:

1. Create and implement a **Chemical Purchasing Policy** which requires that any new chemical purchases be green whenever possible.
2. Identify a master list of sustainable alternatives (e.g., organic fertilizers, biological controls, green chemistry, recycled paint, low volatile organic compounds chemicals, vegetable based lubricants, etc.) for hazardous chemicals.
3. Develop a "Do Not Purchase" list of chemicals prohibited by your organization, particularly those that pose a risk to health and the environment (e.g., PCBs, chemical fertilizers, pesticides, high flash point solvents/paints, petroleum products, etc.).

4. Rank remaining chemicals by their negative environmental impact and effectiveness levels and implement a plan to replace them with green alternatives.
5. Create guidelines for contracted services and vendors (e.g., pest control, custodial, concessions, etc.) that include expectations of not using products on the Do Not Purchase list, using green alternatives, and practicing proper disposal procedures.
6. Ensure a chemical needs evaluation is included in all new/renovation design considerations. Proactive thinking about how to minimize chemical use is vital to planning how the area will be utilized, maintained, and/or cleaned.
7. Utilize composted materials generated at your organization instead of fertilizer, or use organic lawn care products.
8. Develop cleaning Standard Operating Procedures (SOPs). Follow instructions for proper use and dilution of chemicals, keeping minimal water usage in mind.
9. Triple-rinse containers that previously contained pesticide, fertilizer or herbicide chemicals before you recycle them. Capture the rinse water and store as a dilution of the chemical to be used at a later time.

#### **Chemical Management Resources:**

US Environmental Protection Agency (<http://www.epa.gov/>): An organization dedicated to protecting the environment by creating and enforcing law-based regulations.

- EPA Generator Category Summary (<http://www.epa.gov/osw/hazard/generation/summary.htm>).
- EPA Resource Conservation Act, Subtitle C on hazardous waste generators (<http://www.epa.gov/region02/waste/csummary.htm>)

Subtitle C of the Resource Conservation and Recovery Act regulates hazardous waste generators, see: <http://www.epa.gov/region02/waste/csummary.htm>



## Construction

Buildings constructed using sustainable design parameters lower the buildings' lifetime operating costs, which has a positive impact on the institutional annual operating budget. Zoo and aquarium structures built using these parameters also have an increased asset value; conserve energy, water, and other resources; provide a healthier environment for staff, guests, and collections, and qualify for money-saving rebates and other incentives. Here are some interesting statistics regarding the construction of buildings:

- The portion of energy in buildings used inefficiently or unnecessarily = **30%**
- The percentage of U.S. greenhouse gas emissions generated = **17% for commercial buildings and 28% for industrial buildings (combined 45%)**
- The amount of greenhouse gas emissions that would be reduced if the energy efficiency of commercial and industrial buildings improved by 10% = **~ 30 Million vehicles**
- The number of migratory birds that die per year due to collisions with buildings that do not incorporate wildlife-friendly components = **More than 1 billion**

### Construction Inventory:

1. Ensure that the Green Team conducts a complete Construction Inventory that assesses your organization's current construction management strategies on a consistent basis (at least annually).
2. The Construction Inventory should be conducted or updated on an annual basis and should identify the ways existing buildings and exhibits, as well as new capital construction projects, incorporate Green, Leadership in Energy and Environmental Design (LEED) Certified, Green Globes and / or Wildlife Friendly components. Stipulate purchasing practices including vendor information for these components.
3. Quantify the current amount of sustainable, LEED Certified, Wildlife Friendly, as well as unsustainable construction materials your organization uses, and costs associated with each.
4. Document the purchasing practices, including vendor information, for all sustainable, LEED Certified, Wildlife Friendly, and unsustainable construction materials and components that are used onsite.

### Incorporation into your Sustainability Plan:

1. Outline your organization's view on, and current best practices for, sustainable, LEED Certified, and Wildlife Friendly construction of new buildings and projects, renovations, and temporary exhibits.
2. Review, edit, and include current policies or contracts your organization may have regarding construction management (e.g., contract language with contractors and vendors, etc.).
3. Include the Construction Inventory and use it to assess the organization's current collective construction material usage amounts and management strategies.
4. Evaluate and provide examples of ways unsustainable construction materials and practices can be switched to sustainable alternatives.
5. Identify which construction management-related sustainable practice strategies your organization will implement to engage in sustainable construction practices in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual unsustainable as well as sustainable, LEED Certified, and Wildlife Friendly construction material usage amount, and related dollar amount spent, to track trends.

### Sustainable Practice Strategies for Construction:

1. Create and implement a **Green Construction Policy** that requires all capital construction projects over a designated budget amount, including new buildings and projects, renovations, temporary exhibits, as well as smaller individualized projects, to be sustainable, LEED Certified, and/or Wildlife Friendly whenever possible.

2. Identify a master list of sustainable and Wildlife Friendly alternatives for construction materials (e.g., % of recycled content in concrete, sheet rock, and other materials, recycled paint, low volatile organic compounds chemicals, etc.).
3. Develop a “Do Not Purchase” list of construction materials prohibited by your organization, particularly those that pose a risk to health and the environment (e.g., arsenic-treated lumber or highly volatile organic compounds such as paints or finishes; ask yourself, what is your position on pesticide use?).
4. Create and implement a **Construction Purchasing Policy** which requires that any new construction material purchases be sustainable whenever possible.
5. Create guidelines for contracted services and vendors (e.g., waste management, purchasing, certification program, etc.) that include expectations of not using products on the Do Not Purchase list and using sustainable alternatives.
6. Include a local and migratory wildlife needs assessment when planning new construction projects or renovations.
7. If in a bird migratory area, establish a **Bird-friendly Policy** that requires treatment and placement of windows to protect birds from collisions. This policy should also direct staff to keep interior plants away from clear glass to lessen the illusion of a safe refuge and to keep blinds/drapes closed at night to reduce light pollution which attracts birds.
8. Design your landscaping to meet the standards for a NWF **Certified Wildlife Habitat** through the National Wildlife Federation
9. Establish a **Construction Waste Diversion Plan** that requires overall construction waste amounts be cut by a specific percentage amount, and therefore diverted from landfills, within the year. Continue challenging this Plan by raising this percentage amount each year.
10. Establish a protocol to salvage, reuse, repurpose, or recycle construction waste (e.g., landscaping debris, hard surfaces, wood structures, etc.). Most forms of organic waste can be composted; hard surfaces can often be chipped and used as fill for utility trenches, etc.
11. Develop your site in a sustainable manner. Employing green roofs, rain gardens, pervious pavement, shading of hard-scape, and integrated pest management strategies all benefit your site and the environment in general. There are several developing resources including the Sustainable Sites Initiative (<http://www.sustainablesites.org/>).
12. The sustainability of materials and resources can be determined by asking a series of simple questions, such as:
  - Do we need this material or resource?
  - Does it suit the purpose of its intended use?
  - How far did it travel to get here?
  - Does the resource that produced this material regenerate quickly?
  - Did the process of this materials production create toxins that pollute or destroy habitats?
  - How much energy and water did this material require while it was being produced?
  - How much waste did this material generate?
  - Can it efficiently operate?
  - Were the people who produced the material fairly compensated and working under healthy conditions?
  - How long will the material last?
  - Where will it go when it is broken, outdated, or used up?
13. Indoor environmental quality is a key consideration, and takes into consideration the level of particulate matter, gases, and other contaminants (<http://www.epa.gov/iaq/>).
14. Use products made from post consumer contents: A recycled (post consumer) content product includes materials that were recycled. The recycled materials are simply those items that have been diverted and recovered from the traditional waste-stream (most commonly landfills). These products

support a sustainable economy and therefore are preferable to products made from virgin materials.

15. FSC Certified Lumber use: Lumber use has one of the greatest impacts on wildlife habitat. One way to ensure that the lumber you choose has been sustainably harvested is to purchase Forest Stewardship Council certified lumber. Currently there are 177 million acres of FSC certified forest lands in the United States and Canada, and over 3500 companies in the US who are "Chain of Custody" certified. FSC's forest management standards expand protection of water quality, prohibit harvest of rare old-growth forest, prevent loss of natural forest cover and prohibit highly hazardous chemicals, which are all unique aspects of the system (<https://us.fsc.org/advantages-of-fsc.189.htm>).

### **Construction Resources:**

Alliance for Water Efficiency (<http://www.allianceforwaterefficiency.org/>): A nonprofit organization dedicated to the sustainable and efficient use of water and aquatic resources.

Alliance to Save Energy (<http://www.ase.org/>): A nonprofit organization that "promotes energy efficiency worldwide through research, education, and advocacy."

Energy Star (<http://www.energystar.gov/>): An international standard for energy efficient consumer products that employs a labeling system to denote which products have been proven efficient.

Fatal Light Awareness Program (<http://www.flap.org/>): Bird friendly construction and building management.

Green Globes (<http://www.greenglobes.com/>): Provides an "online assessment protocol, rating system and guidance for green building design, operation and management."

LEED (<http://www.usgbc.org/>): A green certification program "for buildings, homes and communities that guides their design, construction, operations, and maintenance."

National Association for Museum Exhibition (<http://www.name-aam.org/>): A networking organization for the American Alliance of Museums that aims "to enhance the cultural landscape by advancing the value and relevance of exhibitions through dialogue among individuals, museum leaders and the public."

- NAME Green Exhibit Guidelines (<http://name-aam.org/uploads/downloadables/OMSI%20Green%20Exhibits%20Guide.pdf>).

National Wildlife Federation (<http://www.nwf.org/>): An organization dedicated to the conservation of wildlife and wild places for the benefit of future generations.

- NWF Certified Wildlife Habitats (<http://www.nwf.org/Home/How-to-Help/Garden-for-Wildlife.aspx?campaignid=WH10A150>).

The American Bird Conservancy (<http://www.abcbirds.org/>): An American nonprofit dedicated to preserving native birds and their habitats.

- ABC Birds and Collisions Page (<http://www.abcbirds.org/abcprograms/policy/collisions/>).

The U.S. Green Building Council recommends the following green-building material resources. Try to follow these applicable recommendations when constructing a new building:

- Scientific Certification Systems (<http://www.scsglobalservices.com/>): Third-party accreditation and auditing.
- Forest Stewardship Council (<https://us.fsc.org/>): Setting standards for forest management.
- Green Seal (<http://www.greenseal.org/>): Promotes conservation through scientific education of consumer, producers, and companies.
- Green Guard (<http://www.greenguard.org/en/index.aspx>): Creates and identifies interior products that are low in chemical emissions.
- Carpet and Rug Institute (<http://www.carpet-rug.org/>): Science-based facts about carpets and rugs.
- Building Green, Inc. (<http://www.buildinggreen.com/>): Provides resources to clients on environmental design.
- U.S. Green Building Council's Frequently Asked Questions sheet on Building Materials (<https://www.usgbc.org/Docs/LEEDdocs/LEEDfaq-materials2.pdf>).

## Energy Management

Energy management includes the planning and operation of all energy related functions in a zoo or aquarium. The objectives of energy management are primarily cost savings, resource conservation, and pollution reduction, in addition to ensuring permanent access to the required energy over the long term. Most forms of energy are easy to measure, and therefore easy to manage. Frequently, energy companies provide easy to track monthly or quarterly metrics.

### Energy Inventory:

1. Ensure that the Green Team conducts a complete Energy Inventory on a consistent basis (at least annually) that assesses your organization's current energy unit usage amounts and management strategies.
2. Identify all energy sources (e.g., electricity, natural gas, solar, wind, hydro, geothermal, fuel cells, gasification, mega-generator, etc.) used and/or generated by the organization.
3. Quantify the current unit usage amount of energy consumed and/or generated (e.g., British Thermal Units [BTUs]), and any costs associated with each source.
4. Document the purchasing practices, including vendor information, of all energy used onsite.

### Incorporation into your Sustainability Plan:

1. Outline your organization's view on, and current best practices for, generating energy and using sustainable energy alternatives, reducing energy usage amounts, and using energy efficient equipment.
2. Review, edit, and include current policies or contracts your organization may have regarding energy management and generation (e.g., Gas Company, electric company, power purchase agreements, etc.).
3. Include the Energy Inventory and use it to assess the organization's current collective energy usage amount and management strategies.
4. Evaluate and provide examples of ways energy usage can be reduced in quantity, switched to a sustainable alternative, and/or eliminated entirely.
5. Identify which energy management-related sustainable practice strategies your organization will implement to reduce your energy unit usage amount in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual energy unit usage amount, and related dollar amount spent, to track trends.

### Sustainable Practice Strategies for Energy Management:

1. Create and implement an **Energy Usage Reduction Policy** that requires overall energy usage amount be cut by a specific percentage amount within the year. Continue challenging this Policy by raising this percentage amount each year.
2. Identify a master list of renewable energy sources (e.g., wind, solar, hydro, geothermal, fuel cells, **gasification system**, mega-generator, etc.) that might be appropriate for your organization to use in each building and exhibit.  
*Helpful Hint:* These options may differ depending upon what part of the country your zoo or aquarium is located in, and even within the footprint of your organization itself.
3. Rank buildings, areas, and exhibits in your organization by their energy consumption level and implement a plan to reduce energy usage and/or switch to renewable energy sources in those that have the greatest potential to become more energy efficient.
4. Create and implement an **Energy Consuming Equipment Purchasing Policy** that requires that any



new energy consuming equipment purchases be Energy Star® labeled.

5. Ensure an energy needs evaluation is included in all new/renovation design considerations. Proactive thinking about how to minimize energy usage is vital to planning how the area will be utilized and maintained.
6. Develop a list of local, state, and federal programs that have resources and/or funding available to help your organization reduce energy usage and utilize as appropriate.
7. Identify and pursue feasible, fundable, alternative energy sources for your organization.  
*Helpful Hint:* Some zoos have secured funding by becoming a demonstration site for new technologies. It should be noted however, that site characteristics are a significant factor to consider when choosing an alternative energy technology (e.g., Do you have the elevation necessary to install wind turbines? Are you in a cloudy location that could benefit from solar hot water heating but not solar electricity? Would drilling for geothermal energy destabilize your property? Etc.).
8. Install **energy management systems** on all buildings that have heating, ventilation, and air conditioning (HVAC) systems to help with temperature regulation (e.g., nighttime temperature setbacks) as well as other functions such as lighting.
9. Install **sub-meters** to understand the energy consumption of individual buildings, exhibits, or pieces of equipment that use a sizable amount of energy. This information will provide the data to better manage large energy users. When multiple structures use one meter it is often difficult to make good management decisions.
10. Enroll in a **Demand Response Program** for specific buildings located within your zoo or aquarium.  
*Helpful Hint:* To reduce peak demand and keep energy costs low, these programs allow energy companies to reduce or turn off electric flow at high-energy use times (typically hot summer days). It is important to ensure that life support systems and other critical areas are excluded in these programs.
11. Review and adhere to preventative maintenance and monitoring plans for equipment requiring energy consumption.
12. Replace incandescent and halogen lighting with more efficient alternatives (e.g., compact fluorescent, light emitting diode [LED]).
13. Replace T-12 lamps and outdated ballasts with T-8 lamps or a more efficient equivalent (e.g., LEDs).
14. When replacing light bulbs, be sure to safely recycle them through a responsible organization that operates in the U.S. Avoid sending bulbs to landfills, incinerators, or recyclers that operate overseas.
15. Train staff to maximize the use of natural light, turn off lighting that is nonessential or in unoccupied spaces, and use task lighting in lieu of overhead lighting when possible.  
*Helpful Hint:* It is vital to ensure that personal and/or site safety is not compromised by lighting energy reduction decisions.
16. Install motion sensors to trigger lights in areas like storage closets, hallways, bathrooms, kitchens and offices throughout your organization.
17. Improve insulation and caulking to reduce air leaks in all HVAC systems.
18. Maintain the occupied temperature in all buildings at 68° F in the winter and 75° F in the summer (+/- 2 degrees). This excludes areas that currently are not heated or cooled and areas with special environmental needs, such as animal spaces.
19. Install programmable thermostats and utilize the night setback features of the building automation system to allow temperatures to rise or fall (depending on the season) closer to ambient temperature in the evening when buildings are unoccupied.
20. Maintain temperatures in low occupancy or unoccupied periods in all facilities at 55° F in winter and up to 85° F in summer. This excludes areas that currently are not heated or cooled and areas with

special environmental needs, such as animal spaces and IT rooms.

21. Provide employee training on how to efficiently set HVAC systems with manual controls. Set day/night, occupied/unoccupied, and seasonal temperatures as described above and only operate window air conditioning units and space heaters when the spaces are occupied.
22. Set automatic sleep and shut off modes on all computers, copiers, printers, and other office equipment. This will minimize the operation and consumption of electricity when not in use. Exceptions should be made for computers performing unique computational functions and certain security operations.
23. Ensure doors and windows in air conditioned spaces/buildings are kept closed at all times.
24. Ensure air intake areas and outflow vents are not blocked.
25. Ensure equipment or devices which affect air temperature are not placed near thermostats.
26. Consolidate activities from lower utilized buildings to higher utilized buildings. This will allow HVAC system run times to be reduced resulting in energy savings. Exceptions should be made for specialty areas such as animal spaces, IT rooms, and other facilities that require constant regulated temperatures.
27. Consolidate office equipment to central locations for shared use. This will reduce the quantity of pieces needed, thereby reducing energy consumption and replacement/upgrade costs.
28. Consolidate appliances to central locations for shared use wherever possible (e.g., buy one large Energy Star® refrigerator and place it in a common area instead of multiple mini-refrigerators in individual offices/areas). This will reduce the quantity of pieces needed, thereby reducing energy consumption and replacement/upgrade costs.
29. Replace current electronics with green electronics (see [EPEAT.net](http://EPEAT.net)) as they wear out.
30. Replace appliances that are more than 15 years old with Energy Star® labeled appliances.
31. Replace boilers that are older than 20 years with more energy-efficient models.
32. Replace water heaters that are older than 10 years with more energy-efficient models.
33. Replace tube-based televisions with LCD televisions.
34. Install video conferencing equipment. This will facilitate staff participation in video conference call meetings rather than traveling via automobile or airplane.
35. Install **Variable Frequency Drives** (VFD) on any motor over 5 HP to create energy savings.
36. Purchase carbon offsets. Be sure to research programs to understand how much of your spending actually goes towards renewable energy infrastructure and where the infrastructure is located. Beware of programs that invest only small percentages towards actual renewable energy generation.
37. Weatherize your operation by investing in energy efficient doors, windows, insulation with a high R-value, etc.,
38. Day-lighting: Utilize natural sunlight to provide lighting in your structures, This can be accomplished through strategically placed clear stories, sky lights, solar tubes, etc.

### **Energy Management Resources:**

Alliance to Save Energy ([www.ase.org](http://www.ase.org)). Promotes energy efficiency through research, education and advocacy.

Database of State Incentives for Renewables & Efficiency ([www.dsireusa.org](http://www.dsireusa.org)). Discover alternative energy funding and incentive opportunities.

Energy Star ([www.energystar.gov](http://www.energystar.gov)). Purchase Energy Star® rated items when possible.

EPEAT ([www.epeat.net](http://www.epeat.net)). Use this environmental rating to identify greener computers and other

electronic equipment.

Lamprecycle.org ([www.lamprecycle.org/](http://www.lamprecycle.org/)). A one-stop source of information about recycling mercury-added lamps.

## Fuel Management

By establishing an annual monitoring program for fuel use, you can empower your organization with the information that is needed to move towards a reduced and more efficient use of fuel resources. When your zoo or aquarium switches to using fuels and equipment with lower carbon emissions you are helping to protect the air quality of your region and the health of the people who live there, as well as mitigating the increased emission of greenhouse gases.

### **Fuel Inventory:**

1. Ensure that the Green Team conducts a complete Fuel Inventory on a consistent basis (at least annually) that assesses your organization's current collective fuel usage and management strategies.
2. Identify all fuel (e.g., gasoline, propane, diesel, oil, fuel alternatives, etc.) used and/or generated (e.g., biofuel) onsite, describe how each is managed, handled, stored, disposed of (including spill and cleanup protocols), and what their environmental hazards are.
3. Identify all fuel-powered equipment (e.g., combustion engines, vehicles, generators, etc.) and vehicles used onsite and calculate the unit amount of fuel used to power each (e.g., MPG for vehicles).
4. Conduct a commuter audit to assess staff commute patterns.
5. Conduct a business travel audit to assess staff travel patterns.
5. Quantify the current unit usage amount of fuel your organization uses, and costs associated with each.
6. Document the purchasing practices, including vendor information, for all fuel and fuel-powered equipment used onsite.

### **Incorporation into your Sustainability Plan:**

1. Outline your organization's view on, and current best practices for, reducing staff fuel-based commuting and business travel, using fuel-efficient equipment, reducing fuel usage amounts, and using sustainable fuel alternatives.
2. Review, edit, and include current policies or contracts your organization may have regarding fuel management (e.g., hazard communication, on site storage, delivery contracts, etc.).
3. Include the Fuel Inventory and use it to assess staff commuting and business travel patterns and the organization's current collective fuel usage amount and management strategies.
4. Evaluate and provide examples of ways fuel can be reduced in quantity, switched to a sustainable alternative, or eliminated entirely.
5. Identify which fuel management-related sustainable practice strategies your organization will implement to reduce your fuel unit usage amount in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual fuel unit usage amount, and related dollar amount spent, to track trends.

### **Sustainable Practice Strategies for Fuel Management:**

1. Create and implement a ***Fuel Usage Reduction Policy*** that requires unsustainable fuel product usage to be cut by a specific percentage amount within the year. Continue challenging this Policy by raising this percentage amount each year.
2. Identify a master list of efficient fuel alternatives (e.g., bio-fuel, steam, natural gas, electric, etc.) that might be appropriate for your organization to use in place of higher emission fuels (e.g., diesel and gasoline).



3. Rank fuel-powered equipment used in your organization by their fuel efficiency level and implement a plan to replace the most inefficient equipment with more fuel efficient equipment or equipment that utilizes sustainable fuel alternatives.
4. Create and implement a **Fuel-Powered Equipment Purchasing Policy** that requires that any new fuel-powered equipment purchases be fuel-efficient or utilize sustainable fuel alternatives.
5. Develop a list of local, state, and federal programs that have resources and/or funding available to help your organization switch to more efficient fuel alternatives and utilize as appropriate.
6. Provide a transit benefit program to encourage the use of public transportation by staff.
7. Participate in a RideFinders or similar program to help staff find carpool partners.
8. Provide staff carpool parking spaces.
9. Provide bicycle parking spaces.
10. Provide staff access to showers and/or changing facilities for bicycle commuters.
11. Provide electric auto charging stations in your parking lot for staff and guests.
12. Develop a **No Idling Policy** that requires guests and staff turn off their automobiles while in the “park” gear, and ensure that appropriate signage and messaging in visitor and contract/vendor work areas are posted (e.g., guest drop off and pick up areas, loading docks, etc.).
13. Train all staff on **Green Driving Protocols** including driving less, eliminating idling, smart acceleration and breaking, and checking the tire pressure with each gas fill up to decrease fuel usage.
14. Implement a **Telecommute/Flex-time Policy** that allows certain staff to work from home for a specific amount of time per month to reduce commuting practices.
15. Implement a **Virtual Meeting Policy** which requires staff to participate in virtual meetings (e.g., WebEx, GotoMeeting, etc.) and video conferences (e.g., Skype) whenever possible to reduce personnel business travel.
16. Require that staff rent only fuel-efficient or hybrid vehicles when they travel for business.
17. Calculate your business-related travel carbon footprint (air travel = average of 46 lbs. of CO<sub>2</sub> per mile traveled).
18. Purchase carbon offsets for your organization's travel carbon footprint each year.
19. Conduct a needs assessment of your organization's fleet vehicles and determine type, available alternative fuels, capacity critical for operations.
20. Establish a minimum baseline MPG requirement for your diesel or gasoline fueled vehicle fleet.
21. Establish a vehicle preventative maintenance program with the primary goal of maximizing the MPG of each vehicle.
22. Switch to electric and/or hybrid vehicles when replacing vehicles in your fleet.

### **Fuel Management Resources:**

Carbon Footprint Calculator (<http://calculator.carbonfootprint.com/calculator.aspx>): Helps calculate your carbon footprint, meaning your total carbon dioxide and methane emissions, using different values and parameters.

Cisco WebEx ([https://signup.webex.com/webexmeetings/US/sem\\_signup\\_tomorrow.html?CPM=KNC-sem&TrackID=1021381&psearchID=webex](https://signup.webex.com/webexmeetings/US/sem_signup_tomorrow.html?CPM=KNC-sem&TrackID=1021381&psearchID=webex)): An online meeting space that reduces potential fuel consumption by eliminating the need for travel.

GotoMeeting Web-conferencing  
([https://www3.gotomeeting.com/m/g2msem3.tmpl?Portal=www.gotomeeting.com&c\\_name=gget-d-](https://www3.gotomeeting.com/m/g2msem3.tmpl?Portal=www.gotomeeting.com&c_name=gget-d-)

[c&c\\_mark=NAPPC&c\\_kwd=gotomeeting-Exact&c\\_prod=GTM&c\\_cmp=sf-70150000000ZD29&qclid=CMiaiqrQsrgCFdFDMgod9yoAUg](http://www.ridefinders.com/FrontEnd/HTML/index.asp?c&c_mark=NAPPC&c_kwd=gotomeeting-Exact&c_prod=GTM&c_cmp=sf-70150000000ZD29&qclid=CMiaiqrQsrgCFdFDMgod9yoAUg)).

RideFinders (<http://www.ridefinders.com/FrontEnd/HTML/index.asp>): Helps find carpoolers available in your area, allowing you to save money on transport, thus reducing total emissions.

## Innovation

Every AZA-accredited zoo or aquarium is unique and has individualized challenges and strengths. Each institution is encouraged to “think outside the box” in order to introduce new concepts, designs, or strategies into your Sustainability Plan, in addition to adapting existing ones. Being innovative in a way that meets your organization’s needs, taps into its strengths, considers the community it operates within, and recognizes existing local sustainability strategies or opportunities will improve sustainability efficiency, productivity, and quality. It is important to remember that sustainability doesn’t just pertain to the environmental sphere, but also the economic and social spheres. Innovative thinking should be considered within all three spheres to maximize the likelihood of greatest success in sustainability.

### Innovation Inventory:

1. Ensure that the Green Team conducts a complete Innovation Inventory on a consistent basis (at least annually) that assesses your organization’s current management strategies for conceptualizing and implementing innovative thinking in order to improve sustainable business operations.
2. Quantify the current amount of innovative ideas your organization implements, and the amount of money saved based on the implementation of these ideas.

### Incorporation into your Sustainability Plan:

1. Outline your organization’s view on, and current best practices for, encouraging innovative thinking and incorporating innovative sustainable practice ideas.
2. Review, edit, and include current policies your organization may have regarding innovation.
3. Include the Innovation Inventory and use it to assess ways in which innovative sustainable practices have been collectively incorporated across the organization and identify innovation-related management strategies.
4. Evaluate and provide examples of ways innovative thinking can be increased between departmental areas.
5. Identify which innovation-related sustainable practice strategies your organization will implement to encourage innovative thinking in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual amount of innovative ideas and money saved based on the implementation of these ideas to track trends.

### Sustainable Practice Strategies for Innovation:

1. Create and implement an ***Innovation Policy*** that specifies the processes by which the staff is encouraged to think outside of the box and innovative sustainable practice ideas are implemented.  
*Helpful Hint:* Be sure that all innovative ideas specify their environmental pros and cons, have the most environmental benefits, do not create unexpected environmental problems (e.g., depending on the distance, offsite composting may generate more emissions than composting saves due to trucking), and best meet the needs of your organization.
2. Develop a list of private, local, or state organizations (e.g., Biomimicry Institute, EPA Greener Venues) that often incorporate innovative ideas and develop partnerships with them as appropriate.
3. Develop a list of sustainable business operation practices being used by other zoos, aquariums, and companies that might be applicable to your organization and utilize as appropriate.
4. Establish a procedure to recognize staff for innovative ideas that they helped implement.
5. Involve visitors in your organization’s Sustainability Plan by promoting the ideas you have implemented (e.g., extend recycling opportunities, offer behind-the-scenes tours) and utilizing their creativity (e.g.,

ask for new ideas/suggestions in person and via social media outlets).

6. Incorporate holistic, life cycle, or systems thinking into sustainable operational decisions and new projects. For example, when managing a work order request for new shift doors, considerations should be made on the longevity and maintenance of materials selection, weight and operability for keeper staff, product resourcing, are there additional projects that can be addressed while addressing the specific topic, etc.
7. Create a framework that considers the material and product lifecycle, and what associated environmental and operational impacts (short and long term) the various alternatives have for the new projects.
8. Develop a systematic organization-wide approach to identifying and managing environmental impacts, such as formal framework of an Environmental Management System (e.g., ISO 14001). This will provide a framework for identifying, evaluating, managing, and improving your organization's sustainable business operations.
9. Utilize research strategies such as Cradle to Cradle and Biomimicry for inspiration and ideas on incorporating innovation into your operations.

### **Innovation Resources:**

Biomimicry Institute (<http://biomimicry.net/>): An organization dedicated to helping companies better emulate natural phenomena when creating their own designs and technologies.

- What is Biomimicry? (<http://biomimicryinstitute.org/about-us/what-is-biomimicry.html>).

Global Reporting Initiative (GRI) reporting (<https://www.globalreporting.org/>): non-profit organization that promotes sustainability by providing organizational reporting guidance.

US Environmental Protection Agency (<http://www.epa.gov/>): An organization dedicated to protecting the environment by creating and enforcing law-based regulations.

- EPA Smart Growth (<http://www.epa.gov/smartgrowth/>): Environmental principles of community development.



## Purchasing

The purchasing of goods, services or works from an external source should be sustainable when possible and integrate requirements, specifications, and criteria that consider environmental protection, social equity, and economic growth factors. Zoos and aquariums can utilize purchasing programs to better meet their needs in terms of quality and quantity while optimizing lower costs by using the buying power of the whole organization, as well as that of the wider-spanning AZA community via the Smart Source Purchasing Program.

### **Purchasing Inventory:**

1. Ensure that the Green Team conducts a complete Purchasing Inventory on a consistent basis (at least annually) that assesses your organization's current collective bulk product usage amount and purchasing management strategies.
2. Identify all products (e.g., office, education, landscaping, food/catering, animal diet, custodial, gift shop supplies, etc.) that your organization purchases in bulk.
3. Quantify the current amount of bulk products your organization uses, both for sustainable and unsustainable items, and their associated costs.
4. Document the purchasing practices, including vendor information, for all bulk items used onsite.

### **Incorporation into your Sustainability Plan:**

1. Outline your organization's view on, and current best practices for, purchasing products in bulk and switching to sustainable products.
2. Review, edit, and include current policies or contracts your organization may have regarding bulk purchasing and the purchasing of sustainable bulk products.
3. Include the Purchasing Inventory and use it to assess the organization's current bulk product usage amount and management strategies.
4. Evaluate and provide examples of ways in which products can be purchased in bulk, unsustainable products can be switched to sustainable alternatives, and product purchasing practices for individual departments can be replaced with those that incorporate the entire organization's needs.
5. Identify which purchasing-related sustainable practice strategies your organization will implement to engage in sustainable product purchasing and management in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual bulk purchases, for both sustainable and unsustainable items, and related dollar amount spent to track trends.

### **Sustainable Practice Strategies for Purchasing:**

1. Create and implement a **Purchasing Policy** which requires that bulk product purchases are managed organizationally and not departmentally, and that products purchased in bulk are sustainable whenever possible.
2. Identify a master list of bulk sustainable product alternatives for unsustainable products (e.g., candy made with vegetable oil, recycled paper made of a minimum of 30% post consumer recycled content, purchasing products with minimal packaging, etc.)
3. Develop a "Do Not Purchase" list of products prohibited by your organization, particularly those that do not get shipped in bulk or pose a risk to health and/or the environment (e.g., Styrofoam containers, individual bottles of water, PVC, coral jewelry, etc.).
4. Rank bulk products that are the most sustainable and have the least amount of impact on the environment and implement a plan to prioritize their purchase in place of those on the Do Not Purchase list.

5. Create guidelines for contracted services and vendors (e.g., custodial, concessions, etc.) that include expectations of not using products on the Do Not Purchase list and using sustainable alternatives.
6. Request vendors to give your organization a green product discount in exchange for making the vendor your exclusive supplier.
7. Obtain used, post-consumer, or repurposed items (e.g., educational books, journals, animal enrichment toys, office furniture, etc.) via "Freecycle" type networks whenever possible.
8. Choose local vendors and suppliers wherever practical to reduce shipping/freight emissions.
9. Switch from purchasing new plastic products to using compostable/recyclable plastics or products made of recycled plastic.
10. Participate in AZA's Smart Source Cooperative Purchasing Programs for price-reduced bulk purchases of sustainable products and services (e.g., Staples business supplies, PPG paints, coatings and architectural products, Pfizer pharmaceutical products, Medline Medical Supplies, Diversey cleaning and sanitization products, etc.).
11. Transition to entirely electronic catalogs and receive and pay bills electronically.
12. Request that all orders from the same vendor be delivered on a pre-scheduled basis (to gain the greatest bulk purchase discount) so that their shipment arrives on the same truck (to reduce transportation emissions).
13. Request minimal packaging for all deliveries (e.g., office supply vendors often deliver goods in reusable crates, rather than in cardboard boxes filled with packing materials) or packaging that can be reused or recycled.
14. Discontinue purchasing all pre-packaged individual bottles of water for sale throughout your organization (e.g., restaurants, gift shops, vending machines, etc.). These can be replaced with reusable water bottles made of recycled materials that can be filled via water fountains.
15. Purchase reusable dining ware for staff and guests if you have energy efficient dishwashing equipment. If disposables are absolutely necessary, purchase compostable cups, utensils, plates and napkins.
16. Purchase sustainable food products (e.g. Monterey Bay Aquarium Seafood Watch Program recommendations) for guests and animals whenever possible.
17. Maintain a garden onsite to produce foods for animal diets and/or enrichment (e.g., fruits, vegetables, bamboo, etc.).
18. Maintain a live foods program for small organisms that can be grown onsite (e.g., algae, crickets, shrimp, rotifers, etc.)
19. Market sustainable items in your gift shops and sales areas. Feature them in shop windows, at entry points, your website, social media etc.
20. Sell reusable shopping bags in your gift shops and provide a discount to guests when they use it onsite again.
21. Charge a five-cent fee for every plastic bag provided in gift shops and restaurants and dedicate these funds to your organization's sustainability plan budget.

### **Purchasing Resources:**

AZA Smart Source Cooperative Purchasing Program (<http://www.aza.org/cooperative-purchasing-programs.aspx>): Exclusive to AZA Institution members and their guests, bulk purchasing has been coordinated with neighboring zoos and aquariums from several companies to increase price leveraging on sustainable products and services:

- Diversey Green Products (<http://www.aza.org/diversey/>): AZA-accredited Institutions and Certified-Related Facilities that are non-for-profit 501c (3) may take advantage of deep discounts on green cleaning and sanitization supplies.

- Johnson Controls: Installs equipment to reduce energy usage and will pay the difference if energy savings do not make up for the cost of equipment, thereby making it a risk-free way to reduce your energy consumption.
- Medline Medical Supplies (<http://www.aza.org/medline/>): AZA-accredited Institutions and Certified-Related Facilities that are non-for-profit 501c (3) may take advantage of deep discounts on medical supplies.
- Pfizer Animal Health Program: AZA-accredited Institutions and Certified-Related Facilities that are U.S. based and 501c (3) nonprofit are eligible to request donated pharmaceutical products.
- PNC Finance & Melink Solar Products: PNC will provide reduced financing rates to fund the installation of Melink solar energy products to AZA-accredited Institutions and Certified-Related Facilities. Institutions need to commit to both providing a location to put the solar array so that servicing can be maintained and to purchasing the solar power from Melink at a specific rate.
- PPG Industries (<http://www.aza.org/ppg/>): AZA-accredited Institutions and Certified-Related Facilities can lower cost through a cooperative purchasing program with PPG, a global manufacturer of paints, coatings and other architectural products.
- Staples Business Advantage (<http://www.aza.org/staples-business-advantage/>): AZA-accredited Institutions, Certified-Related Facilities, Conservation Partners, and Commercial Members are eligible to participate in cooperative purchasing of green business supplies.

Cradle-to-cradle (<http://c2ccertified.org/>): A certification program that uses a holistic, biomimetic approach to create products and systems that are both efficient and essentially waste-free.

Ecolabel Index (<http://www.ecolabelindex.com/>): An immense directory of ecolabels, which are labels for food and consumer products which denote sustainably made and manufactured goods.

Responsible Purchasing Network (<http://www.responsiblepurchasing.org/>): An “international network of buyers dedicated to socially responsible and environmentally sustainable purchasing.”

Seafood Watch (<http://www.montereybayaquarium.org/cr/seafoodwatch.aspx>): Helping consumers make healthy and sustainable choices in terms of fish and seafood.

United Nations Global Marketplace (<https://www.ungm.org/Index.aspx>): The procurement portal of the United Nations system.

- UNGM Sustainable Procurement page (<https://www.ungm.org/sustainableprocurement/>).

US Environmental Protection Agency (<http://www.epa.gov/>): An organization dedicated to protecting the environment by creating and enforcing law-based regulations.

- EPA Environmentally Preferable Purchasing website (<http://www.epa.gov/epp/>): Has a wealth of information about sustainable purchasing standards
- EPA Life Cycle Assessments (<http://www.epa.gov/nrmrl/std/lca/lca.html>): The LCA is a technique used to “assess the environmental aspects and potential impacts associated with a product, process, or service”.

## Waste Management

Much of the focus on climate change revolves around how atmospheric levels of carbon dioxide (CO<sub>2</sub>), a pollutant produced primarily from fossil-fuel combustion, is consistently increasing, and how it accounts for approximately 85% of greenhouse gas emissions. It is important to recognize, however, that atmospheric levels of methane, produced in part by garbage decomposition in landfills, account for an additional 8% of greenhouse gas emissions and may in fact be more damaging to the environment due to it being 21 times more efficient at preventing infrared radiation from escaping the planet's atmosphere.

Zoos and aquariums spend thousands of hours and dollars managing a multitude of waste streams annually. The waste management cycle typically starts at the initial point of generation and continues with collection, sorting, processing, hauling and final disposal. Reductions in any of the components of this cycle can have a positive impact on their bottom line by saving staff time and direct costs as well as our environment.

### **Waste Inventory:**

1. Ensure that the Green Team conducts a complete Waste Inventory on a consistent basis (at least annually) that assesses your organization's current collective waste generation amounts and management strategies.  
*Helpful Hint:* Sort a full day's worth of waste into three categories: garbage, recycling, and compost and weigh each to set target waste reduction and recycling efforts. The more often you sample and sort, the more likely your Waste Inventory will accurately reflect your waste stream's composition.
2. Identify all waste generation sources (e.g., office supplies, food services, composting, animal feces, etc.) across the organization, describe how each is managed, handled, stored, and disposed of (including spill and cleanup protocols), and what its environmental hazards are.
3. Quantify the current unit amount of waste generated for each source (e.g., pounds or cubic feet), and the costs associated with product losses (e.g., excess food) or waste removal.  
*Helpful Hint:* Perform a financial analysis to understand how your waste management rate structures work. Various types of waste management strategies can affect your bottom line differently (e.g., recycling may cost less than land-filling, building an in-house composting area may save on disposal costs in addition to reducing the carbon emissions from trucking the waste out).
4. Document the removal practices, including vendor information, for each source of waste.

### **Incorporation into your Sustainability Plan:**

1. Outline your organization's view on, and current best practices for, reducing waste generation and disposal transport and using sustainable or compostable product alternatives.
2. Review, edit, and include current policies or contracts your organization may have regarding waste management (e.g., hazard communication, contract language with vendors, etc.).
3. Include the Waste Inventory and use it to assess the organization's current collective waste generation/disposal amounts and management strategies.
4. Evaluate and provide examples of ways waste generation from each source can be reduced in quantity, eliminated, or replaced with sustainable and compostable product alternatives.
5. Identify which waste management-related sustainable practice strategies your organization will implement to reduce your waste generation amount in the current year, and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual waste generation amounts for each source, and related dollar amount spent for product losses and waste removal, to track trends.

### **Sustainable Practice Strategies for Waste Management:**

1. Create and implement a **Waste Reduction Policy** that requires overall waste generation and disposal transport be reduced by a specific percentage amount within the year. Continue challenging this Policy by raising this percentage amount over time.
2. Identify a master list of sustainable and compostable alternatives for products that produce a large amount of waste or pose a risk to the environment (e.g., coral jewelry, palm oil based food products, un-recycled paper, food service items.).
3. Develop a "Do Not Purchase" list of products prohibited by your organization, particularly those that generate a large amount of waste and/or require disposal transportation.
4. Rank waste generation sources by their amount of waste, negative environmental impact, and product loss/disposal costs and implement a plan to replace them with sustainable and compostable alternatives.
5. Create contracted service and vendor guidelines that enforce the use of the Do Not Purchase list and use of sustainable and compostable alternatives.
6. Develop a list of companies that provide an opportunity for your organization to profit from the waste you generate (e.g., cash-for-scrap programs, using waste to generate energy, etc.) and switch to these companies as appropriate.
7. Develop a list of local, state, and federal programs that have resources and/or funding available to help your organization reduce overall waste generation and disposal transport and utilize as appropriate.
8. Create a surplus office equipment/supply area for equipment no longer needed, but still in good condition, and establish a procedure for staff to both place old equipment/supplies there and to check this area for items they may need before ordering new items.
9. Create an enrichment surplus area for disposable items that could be reused as animal enrichment with proper veterinary clearance (e.g., cardboard tubes and boxes for puzzle feeders, shelters, and hide boxes; old sheets and towels for bedding; plastic containers to create frozen treats, etc.) and establish a procedure for staff to check this area for items they may need before ordering new items.
10. Identify local organizations in your community that can utilize some of your still usable waste (e.g., local schools may want your old education, electronic, and program supplies) and donate to them.
11. Use a single stream recycling vendor in your community that can pick up several types of materials at once rather than holding multiple recycling contracts.
12. Use a third-party certified recycler (see BASEL Action Network, and eSteward certified) to recycle all old electronics and appliances.
13. Set all printers and copiers to print double-sided to reduce paper waste.
14. Establish a protocol for staff to utilize scrap paper for printing draft and working documents when printing of such items is necessary.
15. Establish a protocol for staff to use a computer projector to share/discuss documents in meetings rather than printing copies for everyone.
16. Establish a protocol for staff to use an electronic document software program (e.g., Google Docs) to edit documents outside of meetings.
17. Contract with a bio-diesel vendor, or build an onsite conversion mechanism, to recycle your cafeteria/restaurant waste oil.
18. Create a surplus food sharing protocol to coordinate interdepartmental usage of all food.
19. Develop a protocol for specific food surplus items to be incorporated into animal diets or enrichment.
20. Use only bulk condiment dispensers throughout your organization (e.g. ketchup, mustard,



mayonnaise, etc.) to reduce individual packaging waste.

21. Do not use extraneous paper or plastic goods dispensers throughout your organization (e.g. cup lids, plastic straws, coffee cup insulator wraps, etc.).
22. Establish a **compost** program for food and horticulture waste generated by your organization by either by providing space for composting onsite or contracting with a local offsite compost facility.
23. Establish **waste stations** for guests and staff to sort food, glass, plastic and paper waste. Waste stations should be conveniently located and well-marked, include instructional signage on proper sorting techniques, and provide examples of why this is important.
24. Consider alternatives where wastes can be used as a product for another process, or fuel resource through various manufacturing partnerships and/or waste to energy concepts.

### **Waste Management Resources:**

The Story of Stuff (<http://www.storyofstuff.org/movies-all/story-of-stuff/>): A short film on production and consumption patterns in modern society.

US Environmental Protection Agency (<http://www.epa.gov>): An organization dedicated to protecting the environment by creating and enforcing law-based regulations.

- EPA Generator Categorization (<http://www.epa.gov/wastes/hazard/generation/>): Descriptions of hazardous waste generators.
- EPA Waste Auditing ([http://www.solidwastedistrict.com/projects/waste\\_audit.htm](http://www.solidwastedistrict.com/projects/waste_audit.htm)): Instructions on how to conduct a waste audit.
- EPA Waste Conservation (<http://www.epa.gov/waste/conservematerials/index.htm>): A list of non-hazardous materials recovered for recycling in the US.
- EPA WasteWise Program (<http://www.epa.gov/epawaste/conservematerials/wastewise/index.htm>): More information about the WasteWise program, which is designed to help organizations reduce industrial waste.
- EPA Waste Types (<http://epa.gov/wastes/hazard/wastetypes/index.htm>): Categorization of waste types.

## Water Management

Water is the most abundant compound on Earth's surface, covering about 70% of the planet. About 98% of this water is salt water, whereas only 1%, the water found in groundwater, lakes, rivers and streams, is considered freshwater available for human consumption. Zoos and aquariums recognize that water is a world resource and actions taken to conserve and maintain healthy waterways and supplies are critical for species conservation.

### Water Inventory:

1. Ensure that the Green Team conducts a complete Water Inventory on a consistent basis (at least annually) that assesses your organization's current collective water unit usage amounts and management strategies.  
*Helpful Hint:* Many local water utility companies and municipalities, as well as some universities and environmental nonprofits, offer low or no-cost water audits.
2. Identify all sources (buildings, food preparation, restaurants, landscaping, fountains, pools/exhibits, animal diets, public misters/fountains, etc.) where water is used, describe how water is discharged, and detail how discharged or greywater is managed, handled, stored, and disposed of.
3. Quantify the current unit usage amount (e.g., gallons) of water used and/or discharged for each source, and costs associated with each.
4. Document the purchasing and discharge practices, including vendor information, for all water used onsite.

### Incorporation into your Sustainability Plan:

1. Outline your organization's view on, and current best practices for, increasing water efficiency as well as reducing water usage and discharge amounts.
2. Review, edit, and include current policies or contracts your organization may have regarding water management (e.g., hazard communication, contract language with vendors, etc.).
3. Include the Water Inventory and use it to assess the organization's current collective water usage amount and management strategies.
4. Evaluate and provide examples of ways water can be used more efficiently, unit usage amounts can be reduced, and/or discharged water can be reused.
5. Identify which water management-related sustainable practice strategies your organization will implement to reduce your water unit usage amount in the current year and stipulate an implementation and outcome measurement schedule for each.
6. At the end of the year, document your annual water unit usage and related dollar amount spent to track trends.

### Water Usage Reduction:

1. Create and implement a **Water Usage Reduction Policy** that requires overall water usage and discharge amounts be cut by a specific percentage amount within the year. Continue challenging this Policy by raising the percentage amount each year.
2. Identify a master list of equipment (e.g., water aerators, motion sensors, waterless urinals, etc.), landscape plants and materials (e.g., local plants, pervious pavements, rain gardens, bio-swales, green roofs etc.), and waste/storm water mechanisms (e.g., rain barrels, cisterns, filtration systems, etc.) that might be appropriate for your organization to use in each green area, building, and exhibit to increase water efficiency and reduce water usage and discharge amounts.
3. Develop a "Do Not Purchase" list of prohibited equipment and landscape plants/materials that do not use water efficiently.
4. Rank green areas, buildings, and exhibits in your organization by their water usage and discharge

levels and implement a plan to reduce these levels in those that have the greatest potential to become more water-efficient.

5. Create and implement a **Water Dependent Equipment Purchasing Policy** which requires that any new water-dependent equipment (sinks, toilets, faucets, etc.) purchases be water-efficient.
6. Ensure a water needs evaluation is included in all new/renovation green area, building, or exhibit design considerations. Proactive thinking about how to minimize water usage is vital to planning how the area will be utilized, maintained, and/or cleaned.
7. Develop a list of local, state, and federal programs that have resources and/or funding available to help your organization reduce water usage and utilize as appropriate.
8. Identify and pursue feasible and fundable water saving sources for your organization.
9. Install **submeters** to better understand and manage usage of an individual building.
10. Establish a plumbing infrastructure leak detection program, prioritize the repairs needed, and implement a plan to complete the repairs (e.g., replace worn valves, repair underground pipe cracks/breaks, repair leaking pools/fountains, etc.).
11. Install water conservation devices on all toilets (e.g., dual flush toilets, compost toilets, waterless urinals, etc.).  
*Helpful Hint:* Keep in mind that local building codes should be consulted and specific drain pipes are needed for some of these technologies (e.g., waterless urinals).
12. Install aerators on all bathroom sink faucets and showerheads.
13. Install motion sensors on all bathroom sink faucets.
14. Install pull-cords to activate showers. This allows water to flow only when the cord is pulled down.
15. Incorporate ways to recirculate water within animal exhibits, particularly for activities that require a source of running water (e.g., enrichment sprays) wherever possible.
16. Add natural substrates in animal exhibits to reduce water use for cleaning wherever possible.
17. Sweep pathways instead of hosing to clean wherever possible.
18. Adjust valves to reduce water flow rates in water features (e.g., animal pools-if approved by animal care personnel, enrichment devices, water fountains, etc.) wherever possible.
19. Require aquatic filtration systems to have a backwash system whereby the backwash is sent to a dirty basin and filtered into a clean basin for recirculation—leaving only a small amount of water to be disposed. Depending on the size of your systems, backwash filtration can save millions of gallons.
20. Require washing machines to run full loads only.
21. Install foot pedals on commercial sinks (e.g. food preparation areas, restaurants, etc.) to make it easy for staff to turn water on and off.
22. Replace old dishwashers with water and energy-efficient models.
23. Require frozen food to be thawed overnight in the refrigerator instead of running items under water. Note that government agency thawing regulations may be in place and should be followed accordingly.
24. Ensure specific staff is trained on the appropriate responses needed to prevent contamination materials from entering storm drains in the event of a spill, that storm drains are routinely maintained and kept free of debris, and that storm drains are labeled as such to increase visitor awareness of the habitats the outflow will impact.
25. Capture rainwater or recycled wastewater for reuse as **greywater** in toilets and/or irrigation. Greywater can be collected in rain barrels or cisterns both below and above ground.  
*Helpful Hint:* You could also assess your rooftop to see whether a rainwater collection system could be installed there. Check with state agencies to be sure greywater reuse is permitted.

26. Plant native plants and/or use xeric (adapted to a dry environment) landscaping wherever possible to reduce watering needs.
27. Implement a plant care protocol that requires greywater be used for irrigation (if permitted in your state) at night to reduce evaporation.
28. Ensure that sprinkler heads are positioned properly to avoid watering paved surfaces.
29. Decrease paved concrete and asphalt surfaces and replace with pervious pavement or other permeable material (e.g., cobblestones, mulch, dirt, gravel, etc.) wherever possible.
30. Install rain gardens, bio-swales, and green roofs to divert rainfall back to the ground wherever possible rather than draining into the sewer system.
31. Discontinue use of salt (sodium chloride), which can have adverse environmental impacts on waterways and drinking water, to melt snow and ice and replace with sustainable alternatives (e.g., sand, sawdust, corn processing byproducts [Bare Ground], sugar beet extract [Geomelt], alfalfa meal, calcium magnesium acetate, etc.).
32. During major construction/renovation projects remove dump and fill water features and replace them with ones that recycle filtered water.

### **Water Management Resources:**

US Environmental Protection Agency (<http://www.epa.gov>): An organization dedicated to protecting the environment by creating and enforcing law-based regulations.

- EPA Water Audits and Measurement (<http://www.epa.gov/region9/waterinfrastructure/water-conserv.html>): Information on water conservation and auditing.
- EPA Stormwater Management (<http://www.epa.gov/oaintmnt/stormwater/>): Information on the importance of stormwater and rain runoff conservation.
- EPA Water Resources (<http://www2.epa.gov/learn-issues/learn-about-water>).

Water: Use it Wisely (<http://wateruseitwisely.com/index.php>): A site dedicated to educating the public about water conservation issues.

## Glossary

**Annual Dollar Amount Saved:** Subtract the current year's total chemical, energy, fuel, waste, and water dollar amount spent from the projected estimated annual cost of these bills at current rates.

**Annual Sustainability Report:** Composed by the Green Team. Content should be transparent and include a summary of the scorecard sustainable practice strategies selected and/or achieved in each topic area, a comparison of the year's annual chemical, energy, fuel, waste, and water unit and dollar amounts spent to the projected cost estimate, the annual dollar amount saved, and the way(s) the savings will be reinvested into the next year's Sustainability Plan. Members of the Green Team, Leadership Teams, and staff who have made significant and key efforts should be highlighted.

**Biomimicry:** A discipline that studies nature's best ideas and then imitates these designs and processes to solve human problems.

**Bioswales:** Landscape elements designed to remove silt and pollution from surface runoff water. They consist of a drainage course with gently sloped sides (less than six percent) and filled with vegetation, compost and/or riprap.

**Bird-friendly Policy:** Requires treatment and placement of windows to protect birds from collisions, interior plants are kept away from clear glass to lessen the illusion of a safe refuge, and blinds/drapes are kept closed at night to reduce light pollution.

**Causal Chains:** A communication process whereby an issue or situation we are concerned about is linked to a consequence (or what happens as a result), a mediating factor, and a solution.

**Certified Wildlife Habitat:** Program managed by the National Wildlife Federation (<http://www.nwf.org/How-to-Help/Garden-for-Wildlife/Create-a-Habitat.aspx>) for the creation of a garden that attracts beautiful wildlife and helps restore habitat in commercial or residential areas.

**Chemical Inventory:** Should be conducted annually and include the type, quantity, and physical location of all chemicals onsite and a Materials Safety Data Sheet for each, identify the ways in which each is used throughout the organization and by outside contractors, stipulate purchasing practices including quantity ordered and vendor information, describe all management, handling, and storage requirements, and identify potential environmental hazards and disposal protocols.

**Chemical Purchasing Policy:** Requires that any new chemical purchases be sustainable whenever possible.

**Compost:** A humus or soil-like material created from aerobic, microbial decomposition of organic materials such as food scraps, yard trimmings, and manure. Material is generated through composting which is a controlled biological decomposition of organic material in the presence of air to form a humus-like material. Controlled methods of composting include mechanical mixing and aerating, ventilating the materials by dropping them through a vertical series of aerated chambers, or placing the compost in piles out in the open air and mixing it or turning it periodically.

**Construction Inventory:** Should be conducted annually and include the ways each existing building or exhibit, as well as new capital construction projects, incorporate sustainable, LEED Certified, and Wildlife Friendly components, stipulate purchasing practices including vendor information for these components, and calculate the amount of sustainable, LEED Certified, and Wildlife Friendly construction material used over the past year.

**Construction Purchasing Policy:** Requires new construction material purchases are sustainable whenever possible.

**Construction Waste Diversion Plan:** Requires overall construction waste amounts be cut by a specific percentage amount within the year.

**Cradle to Cradle:** The term Cradle to Cradle is a registered trademark of McDonough Braungart Design Chemistry (MBDC) consultants. (also referred to as Cradle to Cradle, C2C, cradle 2 cradle, or



regenerative design). It is a biomimetic approach to the design of products and systems. It models human industry on nature's processes viewing materials as nutrients circulating in healthy, safe metabolisms. It suggests that industry must protect and enrich ecosystems and nature's biological metabolism while also maintaining a safe, productive technical metabolism for the high-quality use and circulation of organic and technical nutrients

**Demand Response Program:** Allows energy companies to reduce or turn off electric flow at high-energy use times to reduce peak demand and keep energy costs low. It's important to ensure life support systems and other critical areas are excluded in these programs.

**Dollar Spent Amount:** Total amount spent for chemical, energy, fuel, waste, and water in the past 12 months.

**Energy-Consuming Equipment Purchasing Policy:** Requires that any new energy consuming equipment purchases be Energy Star® labeled.

**Energy Inventory:** Should be conducted annually, identify the type and quantity of energy (electricity, natural gas, solar, wind, hydro, geothermal, fuel cells, gasification, mega-generator, etc.) used and/or generated onsite, stipulate purchasing or generation practices including vendor information, and calculate BTUs/square foot for each building/exhibit as well as total BTU consumption over the past year.

**Energy Management System:** Can be installed in all buildings that have HVAC systems and programmed to regulate temperatures and lighting.

**Energy Usage Reduction Policy:** Requires overall energy usage amount be cut by a specific percentage amount within the year.

**Fuel Inventory:** Should be conducted annually, include a personnel commute and business travel audit, identify the type, quantity, and physical location of all fuel and fuel-powered equipment used onsite, provide a MSDS for each fuel and identify the ways each is used throughout the organization and by outside contractors, stipulate purchasing practices including quantity ordered and vendor information, describe all management, handling, and storage requirements, and identify potential environmental hazards and disposal protocols.

**Fuel-Powered Equipment Purchasing Policy:** Requires that any new fuel-powered equipment purchases be fuel-efficient or utilize fuel alternatives.

**Fuel Usage Reduction Policy:** Requires unsustainable fuel product usage be cut by a specific percentage amount within the year.

**Green Construction Policy:** Requires capital construction projects over a designated budget amount, including new buildings and projects, renovations, temporary exhibits, as well as smaller individualized projects, to be sustainable, LEED Certified, and/or Wildlife Friendly whenever possible.

**Green Driving Protocols:** Instruct staff on how driving less, eliminating idling, smartly accelerating and breaking, and checking the tire pressure with each fill up will decrease the amount of fuel used.

**Green Roofs:** A roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems which can absorb rainwater, provide insulation, and create wildlife habitat.

**Green Team:** Should be composed of upper-level managers and representatives from all departments as well as those that serve the different topic areas defined in this Guide that are actively involved in developing and updating the Sustainability Plan, identifying sustainable practice strategies that can be implemented independently and collaboratively within multiple departments, facilitating decision-making and organizational buy-in, managing Leadership Teams, measuring outcomes, and determining ways to invest the current annual dollar amount saved into the following year's Sustainability Plan.

**Greenwashing:** A superficial or insincere display of concern for the environment that is shown by an

organization.

**Greywater:** Wastewater generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site for uses such as landscape irrigation and constructed wetlands. Greywater differs from water from the toilets which is designated as sewage or black water to indicate it contains human waste.

**Hazardous Chemicals:** Chemicals that pose a risk to health and/or the environment. All chemicals should be properly labeled with their identity and appropriate hazard warnings, and stored in accordance with MSDS specifications. May include cleaning products utilized by custodial, cafeteria, and maintenance staff such as pesticides, fertilizers, de-icers and salts used for grounds maintenance, paints, solvents, degreasers, and lubricants used in building operation and maintenance; oils, fuels, and antifreeze used for automobiles, trains, golf carts maintenance; and chlorine, sodium thiosulfate, hydrochloric acid, and sodium bisulphate used for water treatment.

**Innovation Inventory:** Should be conducted annually and identify the ways in which innovation has been incorporated to improve sustainable business operations across the organization, specify partnerships that make sustainable practices stronger, describe ways in which staff and the Innovation Leadership Team are encouraged to think outside of the box, and calculate the amount of innovative ideas your organization implemented over the past year.

**Innovation Policy:** Specifies the processes by which the staff is encouraged to think outside of the box and innovative sustainable practice ideas are implemented.

**No-Idling Policy:** Requires that guests and staff turn off their automobiles while in park and that appropriate signage and messaging in visitor and contract/vendor work areas are posted.

**Projected Cost Estimate:** First year's unit usage amount at current utility price rates.

**Purchasing Inventory:** Should be conducted annually to identify, quantify, and calculate the associated costs of all products your organization purchases in bulk and document the purchasing practices, including vendor information, for each.

**Purchasing Policy:** Requires that bulk product purchases are managed organizationally and not departmentally, and that products purchased in bulk are sustainable whenever possible.

**Submeters:** Refers to the monitoring of the electrical or water consumption of individual equipment within a building, such as HVAC, indoor and outdoor lighting, refrigeration, kitchen equipment and more. In addition, submetering utilizes individual "submeters" that allow building and facility managers to have visibility into the energy or water use and performance of their equipment, creating opportunities for savings.

**Sustainability Mission Statement:** Should define the zoo or aquarium's current commitment towards sustainable practices, provide measurements to determine success, and serve as a key tool to influence the zoo or aquarium's business operations plan.

**Sustainability Plan:** Should tie into the organization's mission and strategic plan, identify members of the Green Team and Leadership Teams and stipulate their responsibilities, itemize which new sustainable practice strategies will be implemented and how the previous annual dollar amount saved will be directly applied to these strategies, and include a synopsis of the previous year's Annual Sustainability Report.

**Sustainability Vision Statement:** Should communicate the zoo or aquarium's values and guiding beliefs about how and why sustainable practices should be incorporated.

**Sustainable Practice Strategies:** Specific strategies identified for the areas of Awareness, Chemical Management, Construction, Energy Management, Fuel Management, Innovation, Purchasing, Waste Management, and Water Management that can be implemented at your zoo or aquarium to conserve resources. Strategies and checklists to track your organizations efforts can be found in the AZA Green Guide (Volume II): Building and Measuring Zoo & Aquarium Sustainability Plans publication.

**Telecommute/Flex-time Policy:** Allows certain staff to work from home for a specific amount of time per month to reduce commuting practices.

**Unit Usage Amount:** The amount of chemical, energy, fuel, waste, and water your organization used in consistent units of measurement (e.g., gallons, BTUs, etc.).

**Variable Frequency Drives:** A type of adjustable-speed drive used in electro-mechanical drive systems to control AC motor speed and torque by varying motor input frequency and voltage

**Virtual Meeting Policy:** Requires staff to participate in virtual meetings and video conferences whenever possible to reduce personnel business travel.

**Waste Inventory:** Should be conducted annually and identify the type and quantity of waste generated onsite, stipulate purchasing or generation practices including quantity ordered and vendor information, describe all management, handling, and storage requirements, and identify potential environmental hazards and disposal protocols.

**Waste Reduction Policy:** Requires overall waste generation and disposal transport be reduced by a specific percentage amount within the year.

**Waste to Energy:** The process of generating energy in the form of electricity and/or heat from the incineration or gasification of waste.

**Waste Stations:** Conveniently located and well-marked areas that are designated for guests and staff to sort food, glass, plastic and paper waste. Waste Stations should include instructional signage on proper sorting techniques and provide examples of why this is important.

**Water Dependent Equipment Purchasing Policy:** Requires that any new water dependent equipment purchases be water efficient.

**Water Inventory:** Should be conducted annually and identify all sources where water is used, describe how water is discharged, detail how discharged or greywater is managed, handled, stored, and disposed of, stipulate purchasing practices including total consumption in gallons for each source over the past year.

**Water Usage Reduction Policy:** Requires overall water usage and discharge amounts be cut by a specific percentage amount within the year.

## Checklists for Sustainable Practice Strategies

### Awareness

Section Header	Awareness Sustainable Practice Strategies	Year	Currently Implemented Yes No
Green Team	Maintain an active Green Team.		
	Clearly define the roles of the Green Team & ensure that the AZA Green Practices Survey is completed annually.		
	Ensure that the Green Team composes an Annual Sustainability Report.		
Sustainability Plan	Tie your mission & strategic plan into your Sustainability Plan; Identify Green Team members & stipulate their responsibilities.		
	Identify which sustainable practice strategies your organization currently meets in each topic area & indicate the year initiated.		
	Compare the year's dollar amount spent in each topic area to the projected cost estimate; Calculate the annual dollar amount saved.		
	Specify that the annual total dollar amount saved will be directly invested into the following year's sustainable practice strategies.		
Internal Communication	Require all staff to attend an annual Sustainability Meeting.		
	Ensure that the Green Team consults the expertise of departmental staff to help identify which strategies will be selected.		
	Develop an internal communications plan to consistently promote your organization's sustainable practice efforts & accomplishments.		
	Integrate the time & resource needs into staff responsibilities to implement sustainable practice strategies.		
	Schedule interdepartmental meetings to ensure selected sustainable practice strategies are coordinated & implemented across departments.		
	Include progress on sustainability goals in staff performance appraisals.		
External Communication	Ensure that public messaging cannot be interpreted as greenwashing.		
	Use framing strategies that identify clear causal chains to communicate your organization's sustainable practices.		
	Create signage & train educators/interpreters to deliver sustainability messages framed to emphasize how conservation of wildlife requires conservation of resources.		
	Publicly recognize key sustainability efforts made by staff within each department on a consistent basis.		
	Integrate sustainable practices into public programming/events & promote these efforts with signage.		
	Provide mechanisms for guests to successfully achieve or replicate the sustainable practice efforts you promote.		
	Partner with external conservation organizations to expand your reach through a collaborative effort.		
	Coordinate consistent sustainability-related community involvement projects, programs, events, & activities.		

## Chemical Management

Section Header	Chemical Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Chemical Inventory	Conduct a Chemical Inventory on a consistent basis that assesses your current collective chemical usage & management strategies.			
	Identify all chemicals used onsite, describe how each is used across the organization & by outside contractors, managed, handled, stored, & disposed of, & what their environmental hazards are.			
	Quantify the current unit usage amount of chemicals your organization uses, & costs associated with each.			
	Document the purchasing practices, including vendor information, for each chemical used on-site.			
Incorporation into your Sustainability Plan	Outline your view on, & current best practices for, controlling on-site chemical usage, chemical pollution prevention, & using sustainable chemical alternatives.			
	Review, edit, & include any current chemical management policies or contracts that you have.			
	Incorporate the Chemical Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways each chemical can be reduced in quantity, switched to a sustainable alternative, or eliminated.			
	Identify which chemical management-related sustainable practice strategies your organization will implement to reduce your chemical unit usage amount & stipulate an implementation & outcome measurement schedule for each.			
	Document your annual chemical unit usage & related dollar amount spent to track trends.			
Sustainable Practice Strategies for Chemical Management	Establish a chemical screening process to ensure that all products have been screened for environmental, health, & safety hazards.			
	Create & implement a Chemical Purchasing Policy which requires that chemical purchases be green whenever possible.			
	Identify a master list of sustainable alternatives for hazardous chemicals.			
	Develop a "Do Not Purchase" list of prohibited chemicals.			
	Rank remaining chemicals by their negative environmental impact & effectiveness levels & implement a plan to replace them with green alternatives.			
	Create contracted service & vendor guidelines that enforces use of the "Do Not Purchase" list, use of green alternatives, & practicing proper disposal procedures.			
	Ensure a chemical needs evaluation is included in all new/renovation exhibit or building design considerations to minimize chemical usage.			
	Utilize composted materials generated at your organization or organic lawn care products instead of fertilizer.			
	Develop Standard Operating Procedures for cleaning that include instructions for proper use & dilution of chemicals, keeping minimal water usage in mind.			
	Ensure that all pesticide, fertilizer, or herbicide containers are triple-rinsed before you recycle them & that the rinse water is used.			



## Construction

Section Header	Construction Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Construction Inventory	Conduct a Construction Inventory on a consistent basis that assesses your current construction management strategies.			
	Identify the ways in which existing buildings & exhibits, as well as new capital construction projects, incorporate sustainable, LEED certified, & Wildlife Friendly components.			
	Quantify the current amount of sustainable, LEED certified, & Wildlife Friendly, and unsustainable construction materials your organization uses, & any costs associated with each.			
	Document the purchasing practices, including vendor information, for all sustainable, LEED certified, & Wildlife Friendly, & unsustainable construction materials & components used on-site.			
Incorporation into your Sustainability Plan	Outline your view on, & current best practices for, sustainable, LEED certified, & Wildlife Friendly construction.			
	Review, edit, & include current construction management policies or contracts.			
	Incorporate the Construction Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways in which unsustainable construction materials & practices can be switched to sustainable alternatives.			
	Identify which construction management-related sustainable practice strategies your organization will implement to engage in sustainable construction practices & stipulate an implementation & outcome measurement schedule for each.			
	Document your annual non-sustainable, sustainable, LEED Certified, & Wildlife Friendly construction material usage amounts & related dollar amount spent to track trends.			
Sustainable Practice Strategies for Construction	Create & implement a Green Construction Policy requiring all capital construction projects over a designated budget amount be sustainable, LEED certified, and/or Wildlife Friendly whenever possible.			
	Identify a master list of sustainable & Wildlife Friendly alternatives for construction materials.			
	Develop a "Do Not Purchase" list of prohibited construction materials.			
	Create a Construction Purchasing Policy which requires that construction material purchases be sustainable whenever possible.			
	Create contracted service & vendor guidelines that enforce the use of the Do Not Purchase list & use of sustainable alternatives.			
	Include a local & migratory wildlife needs assessment when planning new construction or renovations.			
	Establish a Bird-friendly Policy that requires treatment & placement of windows to protect birds from collisions.			
	Design your landscaping to meet the standards for a Certified Wildlife Habitat.			
	Establish a Construction Waste Diversion Plan that requires overall construction waste amounts be cut by a specific percentage amount, continue challenging this Plan by raising this percentage amount each year.			
	Establish a protocol to salvage, reuse, repurpose, or recycle construction waste.			

## Energy Management

Section Header	Energy Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Energy Inventory	Conduct an Energy Inventory on a consistent basis that assesses your current energy usage amounts & management strategies.			
	Identify all energy sources used and/or generated across the organization.			
	Quantify the current unit usage amount of energy consumed and/or generated & costs associated by source.			
	Document the purchasing practices, including vendor information, for all energy used on-site.			
Incorporation into your Sustainability Plan	Outline your view & current best practices for generating energy & using sustainable energy alternatives, reducing energy usage amounts, & using energy efficient equipment.			
	Review, edit, & include current energy management & generation policies or contracts you have.			
	Incorporate the Energy Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways in which energy usage can be reduced in quantity, switched to a sustainable alternative, and/or eliminated.			
	Identify which energy management-related sustainable practice strategies your organization will implement to reduce your energy unit usage amount & stipulate an implementation & outcome measurement schedule for each.			
	Document your annual energy unit usage & related dollar amount spent to track trends.			
Sustainable Practice Strategies for Energy Management	Create & implement an Energy Usage Reduction Policy that requires overall energy usage to be cut by a specific percentage amount within the year. Continue challenging this Policy by raising this percentage amount each year.			
	Identify a master list of renewable energy sources that are appropriate for your organization to use in each building & exhibit.			
	Rank buildings, areas, & exhibits in your organization by their energy consumption level & implement a plan to reduce energy usage and/or switch to renewable energy sources in those that have the greatest potential to become more energy efficient.			
	Create & implement an Energy-Consuming Equipment Purchasing Policy that requires that energy consuming equipment purchases be Energy Star® labeled.			
	Ensure an energy needs evaluation is included in all new/renovation exhibit/building design considerations to minimize energy usage.			
	Develop a list of local, state, & federal programs that have resources and/or funding available to reduce energy usage & utilize as appropriate.			
	Identify & pursue feasible, fundable, alternative energy sources for your organization.			
	Install energy management systems on all buildings that have HVAC systems.			
	Install submeters to measure direct energy usage associated with a building or specific piece of equipment.			
	Enroll in a Demand Response Program for specific buildings.			
	Review & adhere to preventive maintenance & monitoring plans for all equipment.			
	Replace incandescent & halogen lighting with compact fluorescent or LED bulbs.			
	Replace T-12 lamps & outdated ballasts with T-8 lamps or LED bulbs.			
	Recycle all light bulbs through a responsible organization that operates in the U.S.			
	Task staff to maximize use of natural light, turn off all nonessential lighting, & maximize use of task lighting in lieu of overhead lighting.			
	Install motion sensors to trigger lights where appropriate.			
	Improve insulation & caulking to reduce air leaks in all HVAC systems			
	Maintain the occupied temperature in all buildings at 68° F in the winter & 75° F in the summer (+/- 2 degrees).			
	Install programmable thermostats & utilize the night setback features to allow temperatures to rise or fall to ambient temperature when buildings are unoccupied.			
	Maintain temperatures in low occupancy or unoccupied periods in all facilities at 55° F in winter & up to 85° F in summer.			

Section Header	Energy Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
	Provide employee training on how to efficiently set HVAC systems with manual controls.			
	Set automatic sleep & shut-off modes on all computers, copiers, printers, & other office equipment.			
	Ensure doors & windows in air conditioned spaces/buildings are kept closed.			
	Ensure air intake areas & outflow vents are not blocked.			
	Ensure equipment which affects air temperature is not placed near thermostats.			
	Consolidate activities from lower utilized buildings to higher utilized buildings.			
	Consolidate office equipment to central locations for shared use.			
	Consolidate appliances to central locations for shared use wherever possible.			
	Replace current electronics with green electronics as they wear out.			
	Replace appliances that are more than 15 years old with Energy Star® labeled appliances.			
	Replace boilers that are older than 20 years with energy efficient models.			
	Replace water heaters that are older than 10 years with energy efficient models.			
	Replace tube-based televisions with LCD televisions.			
	Install video conferencing equipment.			
	Install variable frequency drives on any motor over 5 HP.			
	Purchase carbon offsets.			
	Upgrade pumps, motors & filtration systems for energy efficiency			
	Simple payback is weatherization & controlling the building envelope to reduce heating & cooling loss			
	Utilize solar tubes to provide natural lighting to an area, reducing need for artificial lights.			

## Fuel Management

Section Header	Fuel Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Fuel Inventory	Conduct a Fuel Inventory on a consistent basis that assesses your current fuel usage & management strategies.			
	Identify all fuel used and/or generated onsite, describe how each is managed, handled, stored, & disposed of, & what their environmental hazards are.			
	Identify all fuel-powered equipment & vehicles used on-site & calculate the unit amount of fuel used to power each.			
	Conduct a commuter audit to assess employee commute patterns.			
	Conduct a business travel audit to assess employee travel patterns.			
	Quantify the current unit usage amount of fuel your organization uses, & costs associated with each.			
	Document the purchasing practices, including vendor information, for all fuel & fuel-powered equipment used on-site.			
Incorporation into your Sustainability Plan	Outline your view & current best practices for reducing staff fuel-based commuting & business travel, using fuel efficient equipment, reducing fuel usage amounts, & using sustainable fuel alternatives.			
	Review, edit, & include current fuel management policies or contracts you have.			
	Incorporate the Fuel Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways fuel can be reduced in quantity, switched to a sustainable alternative, or eliminated.			
	Identify which fuel management-related sustainable practice strategies your organization will implement to reduce your fuel unit usage amount & stipulate an implementation & outcome measurement schedule for each.			
Sustainable Practice Strategies for Fuel Management	Document your annual fuel unit usage & related dollar amount spent to track trends.			
	Create & implement a Fuel Usage Reduction Policy that requires overall fuel usage to be cut by a specific percentage amount within the year.			
	Identify a master list of efficient fuel alternatives that are appropriate for your organization to use in place of higher emission fuels.			
	Rank fuel-powered equipment used in your organization by their fuel efficiency level & implement a plan to replace the most inefficient equipment with more fuel-efficient equipment or equipment that utilizes sustainable fuel alternatives.			
	Create & implement a Fuel-Powered Equipment Purchasing Policy which requires any new fuel powered equipment purchases to be fuel-efficient or utilize fuel alternatives.			
	Develop a list of local, state, & federal programs that have resources and/or funding available to switch to more efficient fuel alternatives; utilize as appropriate.			
	Provide a transit benefit program to encourage the use of public transportation by staff.			
	Participate in a RideFinders or a similar program to help staff find carpool partners.			
	Provide staff carpool parking spaces.			
	Provide bicycle parking spaces.			
	Provide staff access to showers and/or changing facilities for bicycle commuters.			
	Provide electric auto charging stations in your parking lot for staff & guests.			
	Develop a No Idling Policy & post appropriate signage & messaging.			
	Train all staff on Green Driving Protocols.			
	Implement a Telecommute/Flex-time Policy.			
	Implement a Virtual Meeting Policy.			
	Require staff rent only fuel-efficient or hybrid vehicles when traveling for business.			
	Calculate your business-related travel carbon footprint.			

Section Header	<b>Fuel Management</b> Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
	Purchase carbon offsets for your organization's travel carbon footprint each year.			
	Right-size your fleet vehicles.			
	Establish a minimum baseline MPG requirement for your diesel or gasoline-fueled vehicle fleet.			
	Establish a vehicle preventative maintenance program that's primary goal is to maximize the MPG of each vehicle.			
	Switch to electric and/or hybrid vehicles when replacing vehicles in your fleet.			

## Innovation

Section Header	Innovation Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Innovation Inventory	Conduct an Innovation Inventory on a consistent basis that assesses your current management strategies for conceptualizing & implementing innovative sustainable practices.			
	Quantify the amount of innovative ideas implemented & amount of money saved based on the implementation of these ideas.			
Incorporation into your Sustainability Plan	Outline your view & current best practices for encouraging innovative thinking & incorporating innovative sustainable practice ideas.			
	Review, edit, & include current policies your organization may have regarding innovation.			
	Incorporate the Innovation Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways innovative thinking can be increased between departmental areas.			
	Identify which innovation-related sustainable practice strategies your organization will implement to encourage innovative thinking & stipulate an implementation & outcome measurement schedule for each.			
	Document your annual amount of innovative ideas & money saved based on the implementation of these ideas to track trends.			
Sustainable Practice Strategies for Innovation	Create & implement an Innovation Policy that specifies the process by which staff is encouraged to think outside of the box & innovative sustainable practice ideas are implemented.			
	Develop a list of private, local, or state organizations that often incorporate innovative ideas & develop partnerships with them as appropriate.			
	Develop a list of sustainable business operation practices being used by other zoos, aquariums, & companies that might be applicable to your organization & utilize as appropriate.			
	Establish a procedure to recognize staff for innovative ideas that are implemented.			
	Involve visitors in your organization's Innovation Plan by promoting the ideas you have implemented & utilizing their creativity.			



## Purchasing

Section Header	Purchasing Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
Purchasing Inventory	Conducts a Purchasing Inventory on a consistent basis that assesses your collective bulk product usage amount & purchasing management strategies.			
	Identify all products your organization purchases in bulk.			
	Quantify the current amount of bulk products your organization uses, sustainable & unsustainable, & their associated costs.			
	Document the purchasing practices, including vendor information, for all bulk items used on-site.			
Purchasing Management Plan	Outline your view on, & current best practices for, purchasing products in bulk & switching to sustainable products.			
	Review, edit, & include current policies your organization may have regarding bulk purchasing & the purchasing of sustainable bulk products.			
	Incorporate the Purchasing Inventory into your Sustainability Plan.			
	Evaluate & provide examples of ways in which products can be purchased in bulk, unsustainable products can be switched to sustainable alternatives, & product purchasing practices for individual departments can be replaced with those that cater to entire organization's needs.			
	Identify which purchasing-related sustainable practice strategies your organization will implement to engage in sustainable product purchasing & management & stipulate an implementation & outcome measurement schedule for each.			
Purchasing Methods	Document the annual bulk purchases, sustainable & unsustainable, & the related dollar amount spent to track trends			
	Create & implement a Purchasing Policy that manages bulk product purchases organizationally & includes sustainable products when possible.			
	Identify a master list of bulk sustainable product alternatives for unsustainable products.			
	Develop a "Do Not Purchase" list of prohibited products, particularly those not shipped in bulk or pose a risk to health and/or the environment.			
	Rank products that are the most sustainable & have the least amount of impact on the environment; prioritize their purchase.			
	Create guidelines for contracted services & vendors to not use products on the Do Not Purchase list & use sustainable alternatives.			
	Request vendors to give your organization a sustainable product discount in exchange for making the vendor your exclusive supplier.			
	Obtain used, post-consumer or repurposed items via "Freecycle" type networks.			
	Choose local vendors & suppliers wherever practical to reduce shipping/freight emissions.			
	Switch from purchasing new plastic products to compostable/recyclable plastics or products made of recycled plastic.			
	Participate in AZA's Smart Source Cooperative Purchasing Program.			
	Transition to all electronic catalogs & receive & pay bills electronically			
	Request minimal packaging for all deliveries or packaging that can be reused or recycled.			
	Discontinue purchasing all pre-packaged individual bottles of water for sale throughout your organization.			
	Purchase reusable dinnerware for staff & guests or if disposables are necessary use compostable dinnerware.			
	Purchase only sustainable food products for guests & animals.			
	Maintain a garden on-site to produce foods for animal diets and/or enrichment.			
	Maintain a live foods program for small organisms that can be grown on-site.			
	Market sustainable items in your gift shops & sales areas.			
	Sell reusable shopping bags in your gift shops & provide a discount to guests when they use it on-site again.			
	Charge a five cent fee for every plastic bag provided in gift shops & restaurants, & dedicate these funds to your sustainability plan budget.			

## Waste Management

Section Header	Waste Management Sustainable Practice Strategies	Year	Currently Implemented Yes No
Waste Inventory	Conduct a Waste Inventory on a consistent basis that assesses your current collective waste generation amounts & management strategies.		
	Identify all waste generation sources across the organization, describe how each is managed, handled, stored, & disposed of, in addition to what their environmental hazards are.		
	Quantify the current unit amount of waste generated for each source & costs associated with product losses or in waste removal.		
	Document the removal practices, including vendor information, for each source of waste.		
Incorporation into your Sustainability Plan	Outline your view & current best practices for reducing waste generation/ disposal transport & using sustainable or compostable product alternatives.		
	Review, edit, & include current waste management policies or contracts you have.		
	Incorporate the Waste Inventory into your Sustainability Plan.		
	Evaluate & provide examples of ways waste generation from each source can be reduced in quantity, eliminated, or replaced with sustainable & compostable product alternatives.		
	Identify which waste management-related sustainable practice strategies your organization will implement to reduce your waste generation amount & stipulate an implementation & outcome measurement schedule for each.		
	Document your annual waste generation amounts for each source & related dollar amount spent for product losses & waste removal to track trends		
Sustainable Practice Strategies for Waste Reduction	Create & implement a Waste Reduction Policy which requires overall waste generation & disposal transport be reduced by a specific percentage amount within the year.		
	Identify a master list of sustainable & compostable alternatives for products that that produce a large amount of waste or pose a risk to the environment.		
	Develop a "Do Not Purchase" list of prohibited products that generate a large amount of waste and/or require disposal transportation.		
	Rank waste generation sources by their amount of waste, negative environmental impact, & product loss/disposal costs & implement a plan to replace them with sustainable & compostable alternatives.		
	Create contracted service & vendor guidelines that enforce the use of the Do Not Purchase list & use of sustainable & compostable alternatives.		
	Develop a list of companies that may provide a means for your organization to profit from the waste generated & utilize as appropriate.		
	Develop a list of local, state, & federal programs that have resources and/or funding available to help your organization reduce overall waste generation & disposal transport & utilize as appropriate.		
	Create a surplus office equipment/supply area for equipment no longer needed, but still in good condition & require staff to check this area before ordering new items.		
	Create an enrichment surplus area for disposable items that could be reused as animal enrichment with proper veterinary clearance & establish a procedure for staff to check this area before ordering new items.		
	Identify local organizations in your community that can utilize some of your still usable waste & donate to them.		
	Use a single stream recycling vendor in your community that can pick up several types of materials at once rather than holding multiple recycling contracts.		
	Use an ISO 14001 certified recycler to recycle all old electronics & appliances.		
	Set all printers & copiers to print double sided to reduce paper waste.		
	Establish a protocol for staff to utilize scrap paper for printing draft & working documents.		
	Establish a protocol for staff to begin using computer projectors to share/discuss documents in meetings rather than printing copies.		

Section Header	Waste Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
	Establish a protocol for staff to begin using electronic document software programs to edit documents outside of meetings.			
	Contract with a bio-diesel vendor, or build an on-site conversion mechanism, to recycle your cafeteria/restaurant waste oil.			
	Create a surplus food sharing protocol to coordinate interdepartmental usage of food.			
	Develop a protocol for specific food surplus items to be incorporated into animal diets or enrichment.			
	Use only bulk condiment dispensers throughout your organization.			
	Do not use extraneous paper or plastic goods dispensers throughout your organization.			
	Establish a compost program for food & horticulture waste generated by your organization.			
	Establish waste stations for guests and staff to sort food, glass, plastic and paper waste.			
	Identify opportunities for using waste as a product, resource or fuel source (partnerships with local manufacturers, waste to energy programs, etc.)			

## Water Management

Section Header	Water Management Sustainable Practice Strategies	Year	Currently Implemented Yes No
Water Inventory	Conduct a Water Inventory on a consistent basis that assesses your current water unit usage amounts & management strategies.		
	Identify all sources where water is used, describe how water is discharged, and detail how discharged or greywater is managed, handled, stored, & disposed of.		
	Quantify the current unit usage amount of water used and/or discharged for each source & costs associated with each.		
	Document the water unit usage & related dollar amount spent to track trends.		
Incorporation into your Sustainability Plan	Outline your view on, & current best practices for, increasing water efficiency, reducing water usage & discharge amounts.		
	Review, edit, & include current water management & generation policies or contracts you have.		
	Incorporate the Water Inventory into your Sustainability Plan.		
	Evaluate & provide examples of ways water can be used more efficiently, unit usage amounts can be reduced, and/or discharged water can be reused.		
	Identify which water management-related sustainable practice strategies your organization will implement to reduce your water unit usage amount & stipulate an implementation & outcome measurement schedule for each.		
Sustainable Practice Strategies for Water Management	Document your annual water unit usage & related dollar amount spent to track trends.		
	Create & implement a Water Usage Reduction Policy that requires overall water usage & discharge amounts be cut by a specific percentage amount within the year.		
	Identify a master list of equipment landscape plants & materials, & waste/storm water mechanisms that are appropriate for your organization to use in each green area, building, & exhibit.		
	Develop a "Do Not Purchase" list of prohibited equipment & landscape plants/materials that do not use water efficiently.		
	Rank green areas, buildings, & exhibits in your organization by their water usage & discharge levels & implement a plan to reduce these levels in those that have the greatest potential to become more water efficient.		
	Create & implement a Water Dependent Equipment Purchasing Policy which requires that any new water dependent equipment purchases be water efficient.		
	Ensure water needs evaluation is included in all new/renovation green area, building, or exhibit design considerations.		
	Develop a list of local, state, & federal programs that have resources and/or funding available to reduce water usage & utilize as appropriate.		
	Identify & pursue feasible, fundable, water saving sources for your organization.		
	Install submeters on individual buildings or exhibits to better understand water conservation opportunities		
	Establish a plumbing infrastructure leak detection program, prioritize the repairs needed, & implement a plan to complete the repairs.		
	Install water conservation devices on all toilets.		
	Install aerators on all bathroom sink faucets.		
	Install motion sensors on all bathroom sink faucets.		
	Install aerators on all showerheads.		
	Install pull-cords to activate showers.		
	Incorporate ways to recirculate water within animal exhibits.		
	Add natural substrates in animal exhibits wherever possible.		
	Sweep pathways instead of hosing.		
	Adjust valves to reduce water flow rates in water features wherever possible.		

Section Header	Water Management Sustainable Practice Strategies	Year	Currently Implemented	
			Yes	No
	Require aquatic filtration systems to have a backwash system.			
	Require washing machines to run full loads only.			
	Install foot pedals on commercial sinks.			
	Replace old dishwashers with water & energy efficient models.			
	Require frozen food to be thawed overnight in the refrigerator instead of under running water.			
	Train staff on appropriate responses to prevent contamination materials from entering storm drains in the event of a spill, ensure storm drains are routinely maintained & kept free of debris, & storm drains are labeled to increase visitor awareness.			
	Capture storm-water for reuse as greywater in toilets and/or irrigation.			
	Plant native plants and/or use xeric landscaping wherever possible.			
	Implement a plant care protocol that requires greywater be used for irrigation at night.			
	Ensure sprinkler heads are positioned properly to avoid watering paved surfaces.			
	Decrease paved concrete & asphalt surfaces & replace with pervious pavement or other permeable material wherever possible.			
	Install rain gardens, bio-swales, & green roofs wherever possible.			
	Discontinue use of salt to melt snow & ice & replace with green alternatives.			
	During major construction/renovation projects remove dump & fill water features & replace them with pools managed by mechanical filtration systems			