



# Renewable Energy in Tourism Initiative

## *Best Practices in the Accommodation Sector*



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>ACCOMMODATIONS BEST PRACTICES AT A GLANCE .....</b>	<b>3</b>
<i>Short-term Initiatives.....</i>	<i>3</i>
<i>Long-term Initiatives .....</i>	<i>4</i>
<b>FURTHER QUESTIONS &amp; CONCERNS .....</b>	<b>4</b>
<b>BACKGROUND .....</b>	<b>5</b>
<b>RETI BEST PRACTICE MANUALS .....</b>	<b>5</b>
<b>BEST PRACTICE BY DEFINITION .....</b>	<b>5</b>
<b>CONTENT ACQUISITION AND VALIDATION .....</b>	<b>5</b>
<b>INDUSTRY OVERVIEW AND SUSTAINABILITY INITIATIVES .....</b>	<b>5</b>
<b>CASE STUDY PARTICIPANTS .....</b>	<b>6</b>
<b>BEST PRACTICE CASE STUDIES .....</b>	<b>7</b>
<b>CASE STUDY: FAIRMONT HOTELS &amp; RESORTS .....</b>	<b>7</b>
<i>Background Information on Best Practice – .....</i>	<i>7</i>
<i>The Fairmont Green Partnership Program.....</i>	<i>7</i>
<i>Steps in Implementation.....</i>	<i>8</i>
<i>Resources Required.....</i>	<i>8</i>
<i>Challenges and Pitfalls .....</i>	<i>9</i>
<b>CASE STUDY: INN SERENDIPITY .....</b>	<b>10</b>
<i>Steps in Implementation.....</i>	<i>11</i>
<i>Resources Required.....</i>	<i>11</i>
<i>Monitoring and Evaluation .....</i>	<i>12</i>
<i>Replicability .....</i>	<i>12</i>
<i>Success Factors and Benefits .....</i>	<i>12</i>
<i>Challenges and Pitfalls .....</i>	<i>13</i>
<i>Lessons Learned .....</i>	<i>13</i>
<b>CASE STUDY: PARADISE BAY.....</b>	<b>13</b>
<i>Background Information of Best Practice .....</i>	<i>14</i>
<i>Resources Required.....</i>	<i>14</i>
<i>Monitoring and Evaluation .....</i>	<i>14</i>
<i>Replicability .....</i>	<i>14</i>
<i>Challenges and Pitfalls .....</i>	<i>15</i>
<i>Lessons Learned .....</i>	<i>15</i>
<b>CASE STUDY: TIAMO RESORT.....</b>	<b>15</b>
<i>Background Information on Best Practices.....</i>	<i>16</i>
<i>Steps in Implementation.....</i>	<i>16</i>
<i>Resources Required.....</i>	<i>16</i>
<i>Monitoring and Evaluation .....</i>	<i>16</i>
<i>Replicability .....</i>	<i>17</i>
<i>Success Factors and Benefits .....</i>	<i>17</i>
<i>Challenges and Pitfalls .....</i>	<i>17</i>
<i>Lessons Learned .....</i>	<i>18</i>



*Best Practices in the Accommodation Sector*

**CASE STUDY: SIX SENSES RESORTS AND SPAS** ..... 18

*Background Information on Best Practices* ..... 19

*Steps in Implementation* ..... 19

*Resources Required* ..... 20

*Monitoring and Evaluation* ..... 20

*Replicability* ..... 20

*Success Factors and Benefits* ..... 21

*Challenges and Pitfalls* ..... 21

*Lessons Learned* ..... 21

**CASE STUDY: XANTERRA PARKS & RESORTS** ..... 21

*Background Information on Best Practice – PV System* ..... 22

*Steps in Implementation* ..... 22

*Resources Required* ..... 23

*Monitoring and Evaluation* ..... 23

*Replicability* ..... 23

*Success Factors and Benefits* ..... 23

*Challenges and Pitfalls* ..... 23

*Background Information on Best Practice – Building Management Controls* ..... 24

*Steps in Implementation* ..... 25

*Resources Required* ..... 25

*Success Factors and Benefits* ..... 25

*Challenges and Pitfalls* ..... 25

*Lessons Learned* ..... 25

**CASE STUDY: PROXIMITY HOTELS** ..... 26

*Background Information on Best Practice* ..... 26

*Steps in Implementation* ..... 26

*Resources Required* ..... 26

*Monitoring and Evaluation* ..... 26

*Replicability* ..... 26

*Success Factors and Benefits* ..... 27

*Challenges and Pitfalls* ..... 27

*Lessons Learned* ..... 27

**BETA BOX: SAUNDERS HOTEL GROUP** ..... 27

**ADDITIONAL RESOURCES** ..... 28

**ACKNOWLEDGEMENTS** ..... 29

**REFERENCES** ..... 30

**APPENDIX** ..... 30

**APPENDIX A INN SERENDIPITY HOME POWER** ..... 32

**APPENDIX B: XANTERRA 2008 SUSTAINABILITY REPORT** ..... 41



## EXECUTIVE SUMMARY

Accommodations comprise one of the most highly visible sectors in the travel and tourism industry. With increased public attention on environmental impact of businesses, this sector's management is tasked with finding innovative ways to accommodate that concern while watching the bottom line.

Today that focus is directed on renewable energy and energy efficiency strategies. Estimates indicate that while the energy dollars spent by the lodging industry is small compared to the dollars generated, the accommodation sector is recognizing the benefits gained through more efficient use of energy is viable.

In a business that is driven by the consumer, the consumer who is concerned about sustainability is going to seek out lodging providers who adopt sustainable practices. Another benefit provided by this approach is that of education – as the consumer becomes more aware of renewable energy and energy efficiency strategies and see them in working practices, they are more likely to take that knowledge into their homes.

It is important to note that the greening of the tourism industry, on the whole, is a strong motivator for the accommodation sector. Competition, saving money, and recognition are just three of the benefits gained. The fact that accommodations are pursuing green practices is not lost on other components of the travel and tourism industry.

Adoption of renewable energy strategies to help balance their footprint on the environment and reduction of operating costs are just two positive outcomes demonstrated throughout the case studies shown in this report. More notable, however, are the innovative energy-reduction techniques evolving as the efforts of these accommodations become more sustainable.

This **March 2008** edition of the Renewable Energy Tourism Initiative (RETI) *Best Practices in the Accommodation Sector* draws upon the experiences, insights, and resources provided by Fairmont Hotels & Resorts, Inn Serendipity, Paradise Bay, Tiamo Resort, Six

Senses Resorts and Spa, Xanterra, Proximity Hotel, and Saunders Hotel Group. Additional input is expected from these and other accommodations in the coming months.

Researchers reviewed information published on- and off- line, including media reports and information supplied by these lodging providers and conducted telephone interviews, when possible. Independent verification of claims made were not available to the researchers. Difficulties and challenges in implementing renewable energy practices plus return on investment information may also be currently incomplete.

Seven major areas of renewable energy investment emerged from this research, each falling into one of two general categories. The first highlights short term efficiency projects that require modest capital investment. The second addresses long term initiatives that involve more structural changes, green building construction technologies, and renewable energy resources. In all the areas identified below, management focus and staff buy-in are critical.

*The full Best Practice document provides additional detail and links to resources on each of the outlined best practices.*

### Accommodations Best Practices at a Glance

#### Short-term Initiatives

1. **Lighting Modifications** – Lighting retrofits are perhaps the most attainable of all conservation methods as evidenced by the fact that almost all of the responding case study members utilized the insertion of compact fluorescent bulbs. One even went so far as to initiate a rewards program. Another method used was natural lighting.
2. **Carbon Offsetting** – Similar to other sectors of the tourism industry, many accommodations offer carbon offset programs allowing visitors to offset the environmental impact of their travel.





## Best Practices in the Accommodation Sector

3. **Purchase of Renewable Energy Credits (RECs)** – Whether the lodging purchased wind, solar, or hydro power, this affords a simple step toward sustainability.
4. **Energy Efficient Appliances** – Energy Star rated appliances are providing quick returns on investment for many of the lodging companies. The most commonly utilized appliances are refrigerators, freezers, dishwashers, and front loading washing machines.

### Long-term Initiatives

1. **Automated Energy Conservation Efforts** – Whether using EnergyTrac or Automated Logic, many lodging providers are realizing long term revenue from this initiative.
2. **On-site Generation of Renewable Energy**– Three accommodations found that the savings resulting from the installation of a photovoltaic solar system far outweighed their installation and maintenance costs. Several companies discovered that not only could they afford to generate their own power supplies, but the energy produced with their on-site solar, wind or hydro systems could be sold back to the grid for a profit.
3. **Upgrade and Retrofits of Older Properties** – Common examples of building retrofits are improvements in insulation, boilers, or window replacements.

### Further Questions & Concerns

1. **Quality Information** –Many of the practices presented in this draft do not contain Return on Investment or other critical metrics to allow rigorous comparison of renewable energy options. Without

*this type of information or a method of independent, objective assessment it is difficult to distinguish ‘PR’ speak from substantive progress.*

**Q: Among the wide range of hotel eco-labeling programs, are there mechanisms to provide third-party assessments of renewable energy practices?**

2. **Carbon Offset Verification** – There is no independent verification of carbon offset programs. This includes verification of the calculations of the cost of offsets and the certification that funds are being invested as promised and having the desired effect of offsetting, reducing, or otherwise mitigating CO2 emissions.

**Q: Are independent standards and verification necessary for a robust carbon offset program?**

3. **Technical Information** - Many of the suggested best practices require complex technical and operational information for implementation. There is currently no easy way to share and access the information in these best practices, distinguishing important areas of co-operation from legitimate areas of competitive advantage.

**Q: How does the industry address the issue of information sharing?**

4. **Consumer Demand for Green Energy** – Some industry professionals believe that although consumer are attracted to accommodations that utilize renewable energy, they are not willing to pay more for it.

**Q: Are there studies that confirm these beliefs and if so, is it a valid barrier to participation?**



## BACKGROUND

### RETI Best Practice Manuals

The Renewable Energy in Tourism Initiative (RETI) was developed to feature industry leaders that have adopted best practices in renewable energy and energy efficiency, and to provide information and guidance to businesses interested in realizing these benefits. The best practice manuals were designed for tourism businesses of all sizes. Through the use of case studies, each manual highlights and outlines renewable energy adoption and adaptation strategies that maximize energy efficiency, minimize environmental impacts, and result in cost savings or increased profitability across six tourism sectors: accommodations, airlines, cruise lines, public lands agencies, ski resorts, and tour operators.

These best practice manuals are intended to serve as an inspiration and guide to other businesses interested in realizing the benefits of adopting renewable energy initiatives and supporting a healthy planet. RETI is part of a broader objective of creating a comprehensive set of best sustainable business practices in each designated tourism sector.

### Best Practice by Definition

A best practice is a process, technique, or innovative use of resources – such as technology, equipment, personnel, and data – that has resulted in outstanding and measurable improvement in the operation or performance of a tourism business. Each best practice will have demonstrated success by significantly and measurably improving outcomes in one or more of the following three areas of business performance:

- Operational factors;
- Financial objectives; and
- Marketing objectives

In addition to business outcomes, the best practices outlined in the RETI manuals help to eliminate, minimize, or mitigate the environmental impact of the business through pollution prevention, carbon emissions reductions, and/or carbon offsets, etc.

### Content Acquisition and Validation

Sustainable Travel International (STI) was responsible for acquiring and validating the content included in this document. To identify industry leaders in each segment, STI made public announcements via its E-newsletter, other online outlets, and through word of mouth, then accepted nominations from various stakeholders and completed a due diligence process. Interviews were then conducted with representatives from each company or organization identified, representatives were asked to review each applicable best practice document, verify the information contained therein, and provide constructive feedback. No on-site verification of researched activities was involved, though many of these activities have been verified through other procedures. (These documents will soon be placed in a Wiki web environment so that STI can invite public comment and so that each individual document can be continuously updated and improved upon over time.)

### Industry Overview and Sustainability Initiatives

Hotels and resorts account for some of the largest operations within the travel and tourism industry. According to the American Hotel and Lodging Association, the US\$113.7 billion lodging industry spends US\$3.7 billion per year on energy but much of it goes to waste.<sup>1</sup> This is changing however, as the accommodation sector becomes more energy efficient. The companies featured in this best practice manual have successfully adopted a combination of renewable energy and energy efficiency strategies that achieve cost savings, afford broader market appeal, and reduce environmental impacts.

As the examples in this document will illustrate, implementing energy efficiency and renewable energy initiatives benefit the bottom line as well as the environment. These “greening” initiatives also provide the accommodation with another way to distinguish itself from comparable properties. Competition is driving the green movement within the lodging industry



## Best Practices in the Accommodation Sector

as well; many companies within the private and public sectors – from governmental agencies and non-profit organizations to tour operators and Fortune 500 companies – subcontracting only green hotels through the request for proposal process.

Whether competition or saving money is the driving factor behind the greening of the accommodation sector, this segment of the travel and tourism industry is taking a lead in implementing innovative energy efficiency and renewable energy initiatives. Many have adopted a number of renewable energy strategies to help balance their environmental impact and reduce their operating costs. More notable, however, are some of the innovative energy-reduction techniques that have evolved as part of their efforts to become more sustainable.

### Case Study Participants

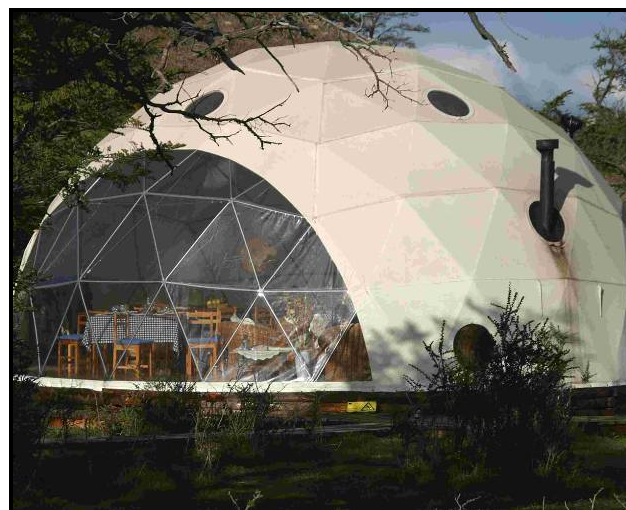
The best practice case studies discussed below include Fairmont Hotels & Resorts, Inn Serendipity, Paradise Bay, Tiamo Resort, Six Senses Resorts and Spa, Xanterra Parks & Resorts, Proximity Hotel, and Saunders Hotel Group.

Some of the most effective energy-related initiatives within the lodging industry include:

- Building management controls (Xanterra, Fairmont)
- A one megawatt solar PV system, one of the largest non-utility systems in the U.S. (Xanterra)
- An 80 kilowatt- windmill, accounting for 150 percent of the property's energy needs (Paradise Bay)
- Energy efficiency measures, reducing needs of a luxury resort to less than that of a normal American household (Tiamo Resort)

- Energy efficiency measures, coupled with grid-tied solar PV and wind systems, as well as solar heating systems and a number of other practices that enable a farmhouse bed and breakfast to be carbon negative (Inn Serendipity)
- One of the largest solar hot water systems in the U.S. (Proximity Hotel)
- Carbon neutral accommodations (Saunders Hotel Group)

Another strategy, not discussed in these case studies, involves solar panel leasing. Companies, such as Solar Edison in the Northeastern U.S. or Citizenrē in Colorado, will pay for, install, and maintain the solar panels in exchange for a monthly 'rental' fee at a flat rate for 25 years or price-per-kilowatt fee paid directly to the solar company. Currently the rate generally works out to a little more than the homeowner's current energy costs, but since the rate is fixed there are no risks of price increases that fossil fuel energy is likely to experience.



Passive solar at a Chilean Ecolodge  
([www.worldwideecolodges.com](http://www.worldwideecolodges.com))





## BEST PRACTICE CASE STUDIES

### Case Study: Fairmont Hotels & Resorts

Fairmont Hotels & Resorts is the largest luxury hotel company in North America. They employ 26,000 people in 51 distinctive properties around the globe. Most of their hotels were among the first buildings to be erected in young cities across America, and Fairmont has preserved their rich history for over a century.



Fairmont Chateau Lake Louis (<http://www.kiwicollection.com>)

In October 1999, Canadian Pacific Hotels and Resorts acquired Fairmont Hotels. Since that time, Fairmont has served as a management company for the properties. In 1990, Canadian hotels (Fairmont's current parent company) pioneered the Green Partnership program, literally writing an early guidebook on sustainable best practices in the lodging industry while developing a comprehensive commitment to minimizing their hotels' impact on the planet. This green philosophy has grown to become a brand core value.<sup>ii</sup>

While Fairmont's status as a management company prohibits them from the development of a company-wide environmental policy, they have nevertheless been successful in bringing many of their properties up to the highest standards in a number of different areas. Some of their best energy-related practices follow:

- In 1996, Fairmont embarked on an ambitious program to cut its energy consumption and reduce

greenhouse gas (GHG) emissions. Of the 37 properties across North America they had at that time, Fairmont targeted the largest, oldest, and most energy-inefficient hotels for massive energy conservation improvements

- Automated building management systems, which provide the operator with the necessary tools to manage their facilities in an efficient and systematic manner
- Lighting retrofits
- Building retrofits, including new boilers, reflective windows, heat recovery systems, improvement to rooftops and insulation, and much more
- They are currently purchasing 390 megawatt-hours (MWh) of wind power per year from the Pembina Institute to offset greenhouse gas emissions generated by all 837 front desk check-in and corporate office computers across North America, which will result in a greenhouse gas reduction of almost 160 tons over 2006 and 2007.

### Background Information on Best Practice – The Fairmont Green Partnership Program

Cost savings was a major driver for Fairmont, as their annual energy bills average US\$23 million, with electricity accounting for nearly half of that. Most importantly, however, being a green company allows Fairmont to cater to the needs of their guests. People are increasingly eco-conscious and demand more from the places where they work and play. The Fairmont Green Partnership program allows Fairmont to meet and exceed guest expectations of operational sustainability.<sup>iii</sup>

The program focuses on improvements in the areas of waste management, energy and water conservation, and innovative community outreach programs involving local groups and partnerships. By focusing on operational improvements, environmental benefits are realized, often through reduced utilities consumption





## Best Practices in the Accommodation Sector

and best practices. Above all else, Fairmont's program focuses on sustainability and encompasses everything from recycling and organic waste diversion in the hotel's kitchens to retrofitting energy efficient lighting. It also includes such activities as redistribution of household goods and food to those in need, purchasing green power, and employing alternate energy technology.<sup>iv</sup>

To conserve energy and cut greenhouse gas emissions, Fairmont has introduced compact fluorescent bulbs in all possible lighting fixtures. California's Fairmont San Jose has installed a cogeneration, or combined, heat and power plant, recycling waste heat generated by conventional power. Cogeneration now produces 60 percent of the hotel's electricity and 100 percent of its hot water.<sup>v</sup>

### Steps in Implementation

In 1996, Fairmont set the goal of cutting energy consumption and greenhouse gas emissions in their oldest and least efficient properties. Later, in 2002, they established a baseline to focus efforts and measure success, which in turn helped them determine staff support requirements, set specific attainable goals, and get the right team in place to run the program.

In order to accomplish these goals, Fairmont stresses the need for partnerships. The Energy Innovators Initiative (EII), under Natural Resources Canada's Office of Energy Efficiency, is one of Fairmont's key partners. Under its incentive program, the EII provides up to 25 percent of the cost of an energy efficiency pilot project to a maximum of US\$250,000 for qualifying recipients. The program uses a contribution formula that rewards recipients for project replicability as well as energy-use reduction. It encourages participating organizations to lower their energy consumption and to replicate a successful pilot retrofit project in their other facilities. Other partners include consultants and energy specialists. In each case, Fairmont entered into performance contracts with energy performance contractors to achieve savings and then used the savings to pay for the costs of the measures.<sup>vi</sup>

### Resources Required

As of 2007, Fairmont saved millions of dollars in energy costs as a result of their best practices. In many cases, the savings were far greater than what was projected.

Results were measured using various energy management tactics. Some properties contract with external benchmarking companies while others use sub-meters and plug the various site data into a proprietary Intranet software system called EnergyTrac. EnergyTrac, which is undergoing a modernizing overhaul, allows hotel engineers to compare water and energy usage across various time periods to confirm that efficiency improvements are succeeding.<sup>vii</sup>

Examples of resource savings include the following exemplary properties:

#### *Fairmont Château Lake Louis, Alberta, Canada:*

The Fairmont Chateau Lake Louis has been purchasing green power since 1999 through an agreement with the Canadian Eco-Logo certified Canadian Hydro Developers. This federally certified EcoLogo company is Alberta's largest producer of renewable energy. The initial switch to green power accounted for ten percent of the Fairmont Chateau's energy use. Presently 40 percent (3,300,000 kilowatt-hours annually) of the property's electricity needs are met by a blend of wind and run-of-river electricity generation.<sup>viii</sup>



*Fairmont Chateau Lake Louis (gocanada.about.com)*



## Best Practices in the Accommodation Sector

Between 1999 and 2004, the use of alternative energy cut Fairmont Chateau's greenhouse gas emissions by approximately 10,000 tons per year. By 2005, green power accounted for an additional 10.5 percent of the Chateau's annual electricity budget.<sup>ix</sup>

### Resource savings:

- Renovated: August 1996 to October 1998
- Cost of Renovations: US\$460,000
- Projected Cumulative Savings: US\$238,283
- Actual Cumulative Savings: US\$381,824

### Major improvements included:

- Service area lighting retrofit (from T12 to T8 electronic ballasts)
- Compact fluorescent lighting installed in all guest rooms
- Glycol heat recovery, recycling exhaust fan heat to corridor makeup
- Automation of lobby and administration fans using scheduled time controls

### *The Fairmont Waterfront, Vancouver, B.C., Canada:*

The hotel installed a heat-recovery system that captures condensate, steam that has been condensed back into water, from domestic hot-water tanks, and then uses it to preheat incoming city water. This process saves an estimated 305,380 kilowatt-hours (1,100 gigajoules) per year, roughly the same amount of energy it would take to power approximately seven average-sized homes.<sup>x</sup>

### Resource savings:

- Renovated: May 1997 to March 1999
- Cost of Renovations: US\$1.95 million
- Projected Cumulative Savings: US\$1,073,099
- Actual Cumulative Savings: US\$1,396,297

### Major improvements included:

- In winter, free cooling with cooling tower and plate heat exchanger
- Fan systems ventilation and pressurization correction
- Condensate heat recovery
- Variable frequency drives (VFD) for chilled water pumps

- Steam trap replacement for laundry system
- Flash steam heat recovery for glycol loop heating
- Replacement of pneumatic compressor
- Replacement of air handling system
- Replacement of DC motors with AC motors
- Fan room retrofit and controls upgrade<sup>xi</sup>

### *The Fairmont Sonoma Mission Inn & Spa in Sonoma, California, USA:*

In 2006, the hotel completed an extensive lighting retrofit. It has replaced 4440 bulbs with energy efficient compact fluorescents. As a result, the hotel has saved over 203,000 kilowatt-hours of energy and annual energy costs of US\$61,000.

The hotel was able to take advantage of an energy rebate with the California Public Utilities Commission for this project, which covered approximately US\$55,000 of the project's total cost of US\$65,000. The total cost to the hotel was approximately US\$11,000 with a return on investment (ROI) of two months, realized in February 2007.

This project will also prevent the release of approximately 300,000 pounds of carbon dioxide from entering the atmosphere.<sup>xii</sup>



*The Fairmont Sonoma* (<http://www.herecomestheguide.com>)

## Challenges and Pitfalls

Early on, Fairmont realized that its exceptional historic properties would offer special challenges. Physical layout and equipment varied greatly from one facility to



## Best Practices in the Accommodation Sector

another, so retrofitting would be much more expensive than new construction. To maintain its reputation for service excellence, both comfort and convenience were essential when retrofitting the hotel rooms. Common areas were also retrofitted so that alterations would not distract from period ambience.<sup>xiii</sup>

### Case Study: Inn Serendipity

Inn Serendipity is an idyllic bed and breakfast located on a five-acre organic farm in the rolling hills of southwestern Wisconsin. It is owned by ecopreneurs John Ivanko and Lisa Kivirist, who have made Inn Serendipity's operations as energy-efficient as possible. As a result, their best practices are both extensive and comprehensive, and their approaches covered at length in their books, *ECOpreneur* and *Rural Renaissance*.

The Inn uses grid-tied hybrid renewable energy systems, generating electricity using both solar and wind energy. The Inn produces all of their own electricity on an annual basis. Excess electricity generated, coming as a credit from their utility, is used to offset summer electricity use and anticipated maintenance costs for the entire system.



*Inn Serendipity with roof solar panels*  
 (JOHN IVANKO/[ecopreneuring.biz](http://ecopreneuring.biz) and [ruralrenaissance.org](http://ruralrenaissance.org))

The owners purchased Energy Star appliances including a Sun Frost refrigerator, a Maytag Neptune front-loading washer and air conditioner, and a KitchenAid convection oven. In addition, an old vertical freezer was replaced by a Frigidaire chest unit and placed in the

cool northeast corner of the basement, rather than adjacent to the oven in the kitchen where it had been previously. Phantom loads (leaking electricity) were eliminated with switched power strips.

In terms of building improvements in the bed and breakfast (B&B), the owners installed double-paned, low-emissive windows, which are designed to act as a thermal mirror. The attic space was insulated to an R-Value of R-19\*, caulking and weather-stripping was applied, and the water heater and hot water pipes were insulated. A solar thermal system was also installed to meet domestic hot water needs. Compact fluorescent bulbs are now used throughout the B&B, and an EPA-certified Lopi Endeavor woodstove is used to heat the B&B in the winter. It should also be noted that the [passive and active solar heated](#) greenhouse was built with straw bales that have an R-Value of R-43 and relies on a separate solar thermal system and furnace that burns bio-diesel processed from waste fryer oil to provide heat.

For long-range travel, the Inn fuels their turbo diesel Volkswagen Jetta with bio-diesel blends secured locally during warm season months. For local short trips, an all-electric CitiCar will soon be regularly used. It is recharged by a .5 kW off-grid photovoltaic (PV) system on site. The PV system also recharges the electric lawn mower and is used for various other electric needs on site.

Inn Serendipity participates in Trees for the Future's carbon-sequestering program and purchases "Trees for Travel" certificates to offset the unavoidable greenhouse gas emissions associated with guest travel. To date, about 3.6 million pounds (or 1,632.93 metric tons) of carbon dioxide has been sequestered through their participation in this program. They also sequester carbon on-site through organic gardening, minimal tilling, and tree planting. The Inn offsets unavoidable greenhouse gas emissions related to transportation to conferences or for their business by purchasing carbon offsets through CarbonFund.org Foundation.<sup>xiv</sup>

\* R-Value is the measure of a material's resistance to heat flow. Commonly used insulation materials, such as cellulose, fiberglass, and rock wool, have R-Values of 3. See: [http://en.wikipedia.org/wiki/R-value\\_\(insulation\)](http://en.wikipedia.org/wiki/R-value_(insulation))





## Best Practices in the Accommodation Sector

### Background Information on Best Practices

The owners spent the first six years of their business focused on energy efficiency rather than the utilization of renewable energy. A solar thermal system was installed before they opened. Before the incentives existed to enable them to begin producing their own power, they purchased “green power” from Alliant Energy, their local energy utility, but concerns over climate change and state funding later became available for renewable energy projects, so the B&B’s owners started developing their wind and solar electric systems.

“It’s not just about sustaining ourselves,” explains John Ivanko, Co-owner of Inn Serendipity. “By overproducing, our neighbors are using renewable energy. We’re producing green energy for our community, whether they want it or not, and they’re not paying anything extra for it. If anything, we’re the ones paying the price for it, but we think that that’s our duty as a business.”<sup>xv</sup>

### Steps in Implementation

All renewable energy systems were added incrementally, as their budgets permitted. The first step was to address energy efficiency within their B&B operation. By implementing a number of building improvements and replacing appliances with more efficient models, they were able to cut their energy needs by 40 percent of that of the previous owners. They then went about building and installing solar hot water and heating systems on the south side of their straw bale greenhouse. Installation details and specs on this and other systems can be found in the Home Power article in **Appendix A - Inn Serendipity Home Power**.

Electricity generation for the home and business came in two phases – solar and wind. The first installment was a 480-watt PV system on the south-facing wall of an existing equipment shed. The installation of this system was part of a workshop with the Midwest Renewable Energy Association (MREA), with students providing much of the labor. With this project, the inverter (an electronic device that produces alternating current from direct current) was “sized” to allow for further expansion.

A 10kW Bergy wind turbine was also installed during an educational workshop for MREA. The turbine was not new, but refurbished, allowing Inn Serendipity to keep capital investments to a minimum. The local utility, Alliant Energy, required a simple contract, certificate of liability insurance, equipment specification sheet, and a lockable external AC disconnect for the project.<sup>xvi</sup>



Solar panels & wind turbine at Inn Serendipity  
 (JOHN IVANKO/ecopreneuring.biz and ruralrenaissance.org)

### Resources Required

Total for heating system: US\$23,761

- Solar hot water system: US\$3,769
- Wood heating system: US\$3,312
- Greenhouse solar heating system: US\$10,634
- Labor estimates for heating system (done here by owners and volunteers): US\$9,045
- Alliant Energy rebate: US\$3,000

Total for wind and solar systems: US\$28,686

- PV system: US\$5,527
- Wind system and workshop: US\$31,075
- Labor estimates for above systems: US\$11,215
- Rebates and Grants: US\$19,131





## Best Practices in the Accommodation Sector

“We have done this making less in earned income than most American families, and discovered that the cost barriers are minimal,” explains Ivanko. “It’s a matter of changing priorities and placing a greater emphasis on the long term.”<sup>xvii</sup>

### Monitoring and Evaluation

The Inn’s renewable energy systems are generating approximately 10,800 kWh of renewable energy annually. This saves the owners over US\$1,200 per annum, plus they receive a credit check of approximately US\$150 per annum.



All-electric CitiCar used for local travel  
 (JOHN IVANKO/ecopreneuring.biz and ruralrenaissance.org)

The Inn’s energy needs have dropped from 15,984 kWh of electricity per year to less than 8,500 kWh per year, produced exclusively from renewable energy sources both on-site as well as through Alliant Energy’s Second Nature green energy program.

The generation of on-site electricity is in excess of actual annual needs. In 2007, Inn Serendipity produced a surplus of 1,870 kWh of electricity for their community. The wind turbine alone generated a total of 10,479 kWh of electricity while the new .7 kW PV system generated a total of 899 kWh of electricity (installed October 29, 2006, replacing an older PV system with no generation data collected).<sup>xviii</sup>

### Replicability

Ivanko explains: “We’re not tinkerers, nor are we financially independent. Our systems were selected based upon their reliability, affordability, and recommendations from ‘hired hands’ that made our

renewable energy journey possible. We chose some of the seasoned and experienced designers, consultants, and dealers that served our state. Our success in employing the renewable energy systems would not have been possible without these experienced guides, plus numerous neighbors pitching in with a tractor or construction expertise, and MREA’s installation workshops. In total, various statewide funding programs helped us to the tune of US\$19,131. In our quest for energy independence, we rediscovered social and community interdependence.”<sup>xix</sup>

### Success Factors and Benefits

- Direct energy savings. The hybrid wind and solar-electric system offsets about US\$1,200 in electricity bills paid each year, and solar thermal system saves 10-15 percent in electricity costs.
- Tax credits and accelerated depreciation. The owners cashed in on the federal renewable energy tax credit of US\$0.018 per kWh generated for wind, or 10 percent tax credit for solar energy equipment. (You can also accelerate the amortization for the system with the federal modified accelerated cost recovery system (MACRS; Section 169 of the Internal Revenue Code). Consult your tax advisor for the latest information.)
- Competitive advantage. Inn Serendipity is one of the few bed and breakfasts in the world powered by renewable energy. Many guests choose to stay at the Inn over other lodging options because of their concern for the environment.
- Free advertising. In nearly every significant renewable energy system addition (wind turbine, PV system, straw bale greenhouse, and solar thermal systems), the owners found an interested and engaged media, eager to report on their sustainable living methods.
- Cleaner, greener operations. The owners’ decision to use renewable energy was based on the desire to operate the business as responsibly as possible, within given financial limitations. Since reducing carbon dioxide, nitrous oxide, and mercury



## Best Practices in the Accommodation Sector

emissions while achieving greater energy self-reliance were equally important, economics alone did not always drive the end result.<sup>xx</sup>

### Challenges and Pitfalls

The inverter on their first PV system failed after 5 years. Although it had a 25-year warranty, the manufacturer could not back it up as they were going bankrupt. The owners eventually had to replace the inverter but salvaged the panels and used them for a smaller stand-alone system that now powers their car. Following this, a larger system with a more tried-and-true inverter made by a reputable company has been installed.<sup>xxi</sup>

### Lessons Learned

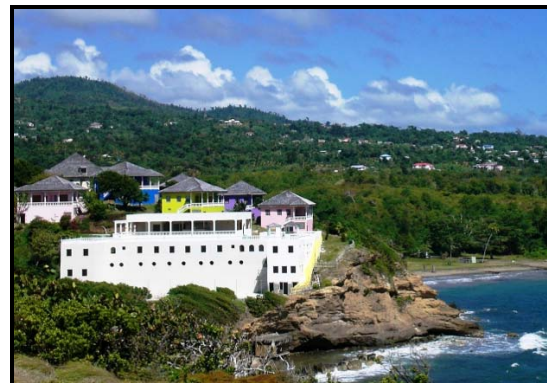
“Have patience and perseverance, and diversify yourself so that if something doesn’t work out, you’re not totally relying on one thing, just like nature isn’t reliant on one thing,” explains Ivanko. “We try to remind ourselves to model nature, and try to build in all these redundancies and interconnections. By doing so, it allows us to live more sustainably without the need to make vast amounts of money. You should also do the necessary research before jumping into something, because that’s where you can really get yourself into a hole financially. Renewable energy solutions should be the last step in the process. Also, whenever possible, buy used equipment to cut costs.”<sup>xxii</sup>

### Case Study: Paradise Bay

Paradise Bay Villa Resort and Spa, which opened in April 2007, is situated on eight acres of national parkland on the Caribbean island of Grenada. The resort offers nine luxury beachside villas, all with ocean views, either for rent or for purchase.

Owner James Post, Dutch entrepreneur and former high-tech electronics executive, is passionate about wind energy. The greatest energy-related success of Paradise Bay is the installation of an 80 kW windmill, which began in March 2007 and now provides 150 percent of the resort’s power needs. With an expected

annual yield of 180,000 kWh, this will make the resort carbon negative, one of Post’s primary goals.



Paradise Bay Resort (courtesy of James Post)

Other related best practices of Paradise Bay include:

- Paradise Bay encourages other resorts to use wind energy and will assist them in their feasibility studies, give practical advice, and offer assistance in installation by a factory trained team. For interested students and prospective windmill owners they organize free seminars at the windmill.
- Energy efficient appliances currently in use include air conditioners with heat recovery units (which convert heat loss into hot water), solar hot water heaters, high efficiency dishwashers, energy-saving lamps, and solar lights. Paradise Bay also plans to install energy efficient refrigerators and washing machines in the near future.
- As part of their awareness initiative, the resort sold energy saving light bulbs to the local public and offered a free lobster lunch with Champagne for every 4 light bulbs purchased during July and August, 2007. They also hold informal seminars to create awareness of energy saving on a regular basis.
- Paradise Bay is purchasing carbon offsets for all guest flights, local transport, and activities on an automatic, audited basis to ensure the carbon neutrality of their vacations. The carbon offset program supports the planting of trees in Ethiopia. For a typical transatlantic flight, 50 trees are planted.



## Best Practices in the Accommodation Sector

- Guests are asked to carpool during tours. For guests going to town, the resort requests that they voluntarily take the bus rather than a taxi.
- Paradise Bay is preparing a project to make bio-diesel from waste kitchen oils.<sup>xxiii</sup>

### Background Information of Best Practice

James Post sees it as his personal mission to prove that wind energy in the Caribbean is practically and economically feasible. Windmills are the clear solution, especially in this region of the Caribbean where electricity is typically generated with diesel generators, and the trade winds allow efficient generation of wind energy. In fact, according to Post, it is possible to have greater than 60 percent of total energy use sourced from the latest renewable energy technologies.<sup>xxiv</sup>

The Dutch company Wind Energy Solutions manufactured the 80 kW windmill. This technology is well established, and the company has been installing the systems worldwide for decades. A unique property of the windmill's control system is that it recognizes when the mains become instable and is able to dynamically limit the output to correct this. This is very important for weaker electricity networks and networks with low minimum usage.<sup>xxv</sup> A detailed description of the construction process, including photos, is available on-line (see References).<sup>xxvi</sup>



Windmill at Paradise Bay Resort ([www.paradisebayresort.net](http://www.paradisebayresort.net))

### Resources Required

The capital investment required for the windmill totaled US\$326,000 and included the purchase price, installation, consultancy and design, interconnection fee, cables and other miscellaneous materials, and container transport. In addition, because this was the first windmill to be installed in the region, a significant amount of management time was needed to negotiate with the electricity company and guide the construction of the foundation.<sup>xxvii</sup>

The cost per kWh for energy produced by the windmill is US\$0.258, taking into account write-offs, product life, maintenance costs, and profits from surplus energy supplied to the local utility. Compared to the electricity company's cost of US\$0.331, this represents a savings of 22 percent. These results are based on expected output, which should be very accurate, but actual data will not be available until December 2008, after the windmill has been in operation for a full year.<sup>xxviii</sup>

### Monitoring and Evaluation

"We don't need complex procedures," says owner Post. "We monitor the energy usage and supply by reading the meters. It's that simple."

### Replicability

Other hotels can implement wind energy successfully and economically if the local electricity company cooperates and pays a reasonable price per kWh, the hotel's power use is at least 90,000 kWh in a 6 m/s (speed) wind regime, and the windmill can be placed in an area of the resort where its presence is non-disturbing.

For larger windmills, the cost per kWh will go down substantially. Smaller windmills are significantly more expensive per kWh. In fact, solar panels are usually a better option for accommodations whose energy needs are smaller.

Paradise Bay was recently approached by a company specializing in the upgrading of wind parks. The cost per kWh of these refurbished 250 kW windmills is





## Best Practices in the Accommodation Sector

extremely low at around US\$ 0.06 which even rivals large wind parks. James Post offers hotels (and others) consultancy assistance to evaluate the feasibility and assist with the implementation. Requiring a modest investment of around US\$260,000, this category produces about 580,000 kWh.

Even without implementing renewable energy, most hotels can make a contribution to environmental conservation by implementing a comprehensive energy saving program, which usually results in significant cost savings.<sup>xxix</sup>

### Challenges and Pitfalls

Convincing the electricity company to support the initiative was a major challenge. Discussions started in 2000, and after initially being declined, negotiations restarted in early 2006, leading to a principal agreement in October, 2006. The windmill was installed in March, 2007, but the interconnection was delayed until Spring 2008, because the electricity company deemed it necessary to undertake a number of studies. Post found that it is difficult to negotiate with a company that has a monopoly. Persistence and good public relations were the keys to getting the project off the ground.<sup>xxx</sup>

There are hurdles to overcome during technical installation of renewable energy systems in developing countries. In the Caribbean, small issues can quickly grow into larger issues that cost significant amounts of time and money. The project presented many firsts for construction companies on Grenada, which resulted in one crisis after another. However, the next installation should proceed more smoothly since those involved will be able to more easily anticipate potential problems.<sup>xxxi</sup>

### Lessons Learned

It is vital that a contract with a local or regional electricity company be signed before committing to a project of this nature. If Paradise Bay were to do this again, they would set up a larger windmill (250 kWh) and seek financing at a better interest rate than they found in Grenada (10.5 percent).<sup>xxxii</sup>

### Case Study: Tiamo Resort

Tiamo Resort is another Caribbean beach resort set in the Out Islands of the Bahamas. Since opening in 2001, they have offered eleven private beachside bungalows, each with a view of the South Bight of South Andros Island and surrounded by 125 acres of natural paradise.<sup>xxxiii</sup>



*Tiamo Resort from above (www.tiamoresorts.com)*

Their energy-related initiatives are noteworthy. A stand-alone solar PV system provides 100 percent of the resort's energy. All hot water is derived from thermal hot water heaters (no electricity or gas is used) - each two-person beach bungalow is fitted with a 30-gallon heater, and the commercial kitchen utilizes two 50-gallon heaters. The water heating ability is so great that tempering valves must be used to mix cold water with the boiling hot water created by the heaters.

Buildings at Tiamo use several passive-cooling techniques including wraparound porches to keep direct sun from main living areas, white reflective roofs, high-pitched ceilings, and an open design for maximum airflow. Each beach bungalow has been situated amid its pre-existing surroundings, placed within indigenous trees and vegetation for additional shade benefit, optimum views of the water, and privacy. In addition, each building is elevated using simple columns for minimum site impact and cooling purposes. No land alteration was necessary, which helped to minimize erosion.<sup>xxxiv</sup>





## Best Practices in the Accommodation Sector

### Background Information on Best Practices

Tiamo's PV system has a daily electricity generating capacity of over 130,000 watts and a battery storage facility totaling 4,075 amp hours. The system supplies all of the resort's energy – all appliances and facilities and a full kitchen that serves an average of 800 meals per week in the high season – meeting the needs of 22 guests and 30 staff members.



*Aerial photography reveals Tiamo's field of solar panels, hidden from view at ground level. (www.tiamo.com)*

“But our shining achievement, no pun intended, is not in our use of solar power, but rather in our energy efficiency measures,” explains Mike Hartman, President of Tiamo Resorts. “This is the opposite of what our American economy usually focuses on, which is more about greater production and greater consumption. We fix our problems here by maximizing our efficiency and minimizing our consumption. It's much cheaper for us to do that than to create more energy. And, yet we do this without in any way diminishing the guest experience, which is essentially a given since Tiamo is a high-end resort.”

Energy conservation practices include the use of energy-efficient appliances (which are often residential models instead of the less efficient commercial models), solar hot water heaters, the avoidance of any type of heating element in the kitchen (using French presses, for example, instead of electric coffee makers), and the passive cooling techniques previously mentioned. These measures allow the PV system to be as effective as possible. With the help of these conservation

practices, Tiamo's energy use is 950 kWh per month – less than that of a normal American household.

### Steps in Implementation

Tiamo Resorts' PV system was designed by Jeff Oldham. Oldham is regarded for his expertise and his common sense, hands on approach to implementing high quality, alternative renewable energy and waste management systems. Oldham sent an instruction manual to Hartman, who completed the installation with the help of Tiamo employees, other local South Andros Island citizens, and an electrician who came out to the island to do the final hook up.

“Putting in a PV system looks complex, but it's actually pretty simple,” offers Hartman, who goes on to say, “There are three basic components: the panels, the battery pack (if you're not contributing back to the grid), and the inverter to change from DC to AC. It's not difficult, but I wouldn't suggest that everyone build their own power supply. If, however, everyone in the US reduced their energy consumption by 10 percent (I don't know the exact statistics on this), it would be enough to shut down several power plants. I don't want to glorify PV, because the goal is to effectively implement energy efficiency without having to significantly change lifestyles. It's very possible, but we're just not taught to do that.”<sup>xxxxv</sup>

### Resources Required

The initial investment for the PV system was US\$120,000, and the replacement cost for a battery pack was US\$15,000. The resort's first pack lasted 5 years. They are now on a second pack, which is expected to last longer due to improved maintenance. Hartman estimated that the system, now seven years old, paid for itself within three years based on what other similar sized hotels' energy use.

### Monitoring and Evaluation

Tiamo measures electricity consumption twice a day. They have meters that measure daily electricity produced at the resort less their daily kW consumption illustrating their daily net use. A flow meter monitors daily water use. They also evaluate internal systems



## Best Practices in the Accommodation Sector

using the “Kill-a-Watt” device, which will measure all electric consumption per outlet by simply plugging it in.

### Replicability

Hartman asserts that his practices are very easy to replicate. “They are standard systems that are easy to buy in a lot of places, including complete solar electricity generating systems. Composting toilets also involve nothing more than a simple purchase. The Sun Mar brand is very effective for the tropical climate found in the Caribbean.”

“Everything else comes down to good management. Tiamo’s entire operations consume a mere 950 kW per month, which is less than a typical American household. First, the system needs to be defined (how you choose to cool, heat, illuminate etc.). That is the easy part. The hard part is monitoring the systems’ implementation, especially if its not an automated process. Humans like to take short cuts, so any system controlled by managers and employees need to be couple with effective communicating and buy-in by those people. so If one person built and designed a system, but another makes the purchasing decisions for that facility, that person needs to understand it well enough to purchase items compatible with the system.

“You need to decide where to spend your energy (no pun intended). Production is not where your success lies, no matter where you are in the world. The reality is that the smarter business persons spend their energy figuring out how to consume less of it.



Passive cooling with open-air design ([www.tiamoresorts.com](http://www.tiamoresorts.com))

### Success Factors and Benefits

Most important to Tiamo has been the reduced consumption of fossil fuels and impact on the local ecosystem. There have also been significant social benefits to the staff, but even more so to the guests.

“Our staff generally don’t have the resources to make significant changes at home right now, but it’s changed the way they look at the environment, different species, trash, and so forth. Slow but sure modifications in their behavior are starting to be noticed. It takes time, and we don’t want to push it on anyone, because then they won’t listen,” explains Hartman.

“Impact on our guests has also been tremendous in many cases. They’re so surprised. We don’t generally cater to eco-tourists – no one goes on vacation to sit on a composting toilet. So we’re not speaking to the choir, but rather to vacationers who are looking for a great time on a remote island with abundant nature-based activities, comfortable accommodations and great food. When they find out that we’re also the most sustainable operation around, they respond positively to that. They’re motivated to change the way they live – some go sell their cars and buy hybrids, others change their purchasing habits and waste-management strategies at home; some even change their careers.”

“Business benefits are huge as well – perhaps largely thanks to Al Gore – but ‘green’ is now a powerful marketing tool. Marketing aside, I think it’s made us a better destination, because people feel good about it. It feels better when you’re here. It’s overall a fantastic way to do business, and that was our goal.”<sup>xxxvi</sup>

### Challenges and Pitfalls

“Bringing staff together and getting them all on the same page has been a challenge. It’s no different than any other business,” Hartman says, but he feels like a parent, constantly telling everyone to turn lights off, etc. “It’s a constant battle, but one that has great rewards.”<sup>xxxvii</sup>

The absence of renewable energy storage technology is another frustration. Tiamo resort is totally off the grid,



## Best Practices in the Accommodation Sector

four miles from anything, and completely self sustained. The renewable energy they generate goes into a battery system that stores net gains for a short time, but not forever. So, if there's no sun for several days, they have to fall back on their back up generator. On the other hand, if it is very sunny and Tiamo produces extra energy, they cannot sell it back to the electricity company from where they are in the Bahamas as they are not only too far away from the grid, but it is also illegal.

### Lessons Learned

"People can be easily scared off by extremists. Don't get me wrong. I have some pretty strong opinions and I'm not afraid to voice them, but people want to know that you're normal, that you can speak their language, and that they're not being brought into some situation where they're going to have to feel guilty. We go about this in a very low-key way, and I think that's a big part of our success. We can sit there and blast everybody in the world for the way they do the things they do, or we can just make our little piece of the pie a little bit better and apply common sense approaches as to how to do that, and then use those examples to help people change what they're doing."<sup>xxxviii</sup>



Solar panels at Tiamo ([www.tiamoresorts.com](http://www.tiamoresorts.com))

### Case Study: Six Senses Resorts and Spas

Six Senses Resorts and Spas is a resort and spa management and development company that operates properties branded as Soneva, Evason, Evason Hideaways, Six Senses Hideaways, Six Senses Destinations, and Six Senses Spas. The company has nearly 40 properties in 15 countries, and these numbers continue to grow as development expands. One of their oldest properties, Evason Phuket and Six Senses Spa on Phuket Island in Thailand, is a shining example of their successful environmental program.<sup>xxxix</sup>



Phuket uses water ponds and natural ventilation for heat regulation. ([@Kiattipong Panchee & Vichit Yantapanit](#))

A number of energy-related strategies have been employed at Evason Phuket, including:

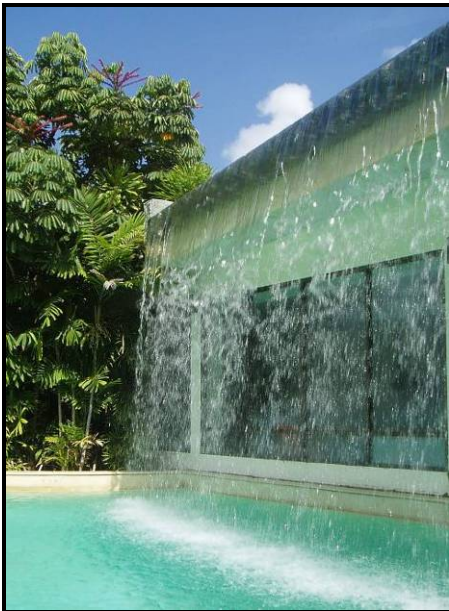
- Energy monitoring system with peak demand control with a timer and light schedule setting to reduce peak demands
- Refitting split type air-conditioning system with much more efficient mini-chiller system at the property's Sundeck Wing
- Utilization of gas as a heat source for solar thermal plant backup and hot water for laundry, further reducing carbon dioxide emissions over a traditional diesel back up boiler and much less than an electrically heated boiler
- Water pumped up to highest point to allow use of





## Best Practices in the Accommodation Sector

- gravity in distribution, thus reducing water pumps and energy consumption
- Water reservoir collecting rainwater making the resort self-sufficient
- Installed medium voltage (6.6kV) underground electrical cables to reduce power loss due to length of running power cables. (This initiative also improved the esthetics and safety by removing overhanging cables. It also has reduced breakage and maintenance cost of electrical equipment due to less fluctuations.)
- Use of energy efficient light bulbs – PAR 38 Megaman (20 watt)
- Double glazed windows to reduce heat loss
- Hot water heated by use of solar thermal plant
- Water pond by the lobby used to create insulation and cooling for conference room
- Waterfall used to create insulation and cooling for Just Kid's Club



A heat-regulating waterfall (Photo courtesy of Six Senses)

- Natural ventilation is used in the lobby and restaurants instead of air-conditioning
- Renovation of main kitchen has maximized natural ventilation and light with refrigerators built into the wall to dispose of heat outside
- Fitness Centre relocated to Sundeck Wing, where cooling is supplied by a centralized 20 ton air-conditioning unit as well as natural cooling to save energy
- Power diesel generator on low revolutions per minute<sup>xi</sup>

### Background Information on Best Practices

Evason Phuket's environmental efforts stem from Six Senses' company-wide policy, which is referred to as the Holistic Environmental Management Plan. As the first Green Globe 21-certified resort in South East Asia, Evason Phuket has also incorporated triple bottom line benchmarks and standards into its policy as well.

Over the course of the past six years, Six Senses has extensively tested and implemented new sustainable technology in their properties, including bio-fuels, biomass systems, wind energy generation, micro-hydro plants, heat recovery from running power generation plants (or co-generation, which is defined as the simultaneous or sequential production of two or more forms of useful energy from a single primary energy source), solar thermal, centralized mini-chillers, heat recovery from heat pumps, steam recovery, and finally, the back-up system of energy-efficient, and low-emissions gas-fired boilers. All of these are basic standards in the company's environmental development plan for any new project, and many of these technologies are already in place at Evason Phuket.<sup>xii</sup>

### Steps in Implementation

The original property was built in 1972 and was called Phuket Island Resort. Six Senses was initially invited to be the management company, and in the process, the owner decided to sell the property. Six Senses bought it





## Best Practices in the Accommodation Sector

in 2001, closed it down, and completed an extensive 16-month renovation. Evason Phuket has been in operation ever since and is widely regarded as the top resort on Phuket Island.

As Six Senses' oldest property, Evason Phuket offered valuable information regarding energy use and efficiency. Directly after reopening, management began monitoring and analysis using building management systems to help identify the peak needs of the property. Evaluating each new technology on a case-by-case basis, they explored ways of bringing energy use and costs down. Initially, the property required two 1300-kW transformers. Today, the whole resort, which has expanded in staff and guest capacity, operates on one 1100-kW transformer. The whole transformation took place over four years, with the first two years dedicated solely to data collection and analysis.<sup>xlii</sup>

### Resources Required

The systems that have been installed in Phuket are established systems. The return on investment (ROI) for the technologies utilized range from one to eight years, depending on the system, but all in all, ROI is very low. Furthermore, any additional increase in the price of fuel drives the ROI down even further.<sup>xliii</sup>

- Investment for the Energy Monitoring System with Peak Demand control was US\$4,500, which enabled Phuket to achieve 10% energy savings as well as identify areas to achieve further savings.
- Investment for Mini Chiller system was US\$130,000, which saves US\$45,000 annually and was paid for in 2.8 years.
- Investment for the Quantum Heat Recovery was US\$9,000, which saves US\$7,500 annually, resulting in a 1.2 years payback period.
- Investment for the Laundry Hot Water System was US\$27,000, which saves US\$17,000 annually for a 1.6-year payback period.
- Investment for the Megaman Par 38 (20 Watt) was US\$8,500, which resulted in US\$16,000 annual

savings and took a mere six months to payback. Considering the longer lifespan of the compact fluorescent lights compared to incandescent lights, the initial investment can be reduced to US\$0 with additional US\$1,000 in annual savings.

- Investment for the Water Reservoir was US\$36,000, provides an annual savings of US\$330,000 and a 1-month payback period.

### Monitoring and Evaluation

Six Senses uses an online monitoring and reporting system to track progress at each of their properties to Green Globe benchmarks and indicators. Evason Phuket is by far the most efficient at 59 percent - better than the Green Globe benchmarks for energy consumption. The money the company saves through these practices is put directly back into additional renovations, and that is how they consistently achieve the highest standards.<sup>xliv</sup>

### Replicability

Environmentally friendly development is something any organization can do. Any organization can establish an Environmental Management System (EMS), which would be the first recommendation. It is also recommended to appoint someone in charge of the EMS like an Environmental Champion. Ideally, it should be a person that works full-time on environmental issues. However, if financial constraints do not allow that, a person within the organization could do it. The drawback with appointing a Chief Engineer or HR Manager, for example, is that these have a lot of other responsibilities, which may have priority over the environmental issues. Quite easily the environmental issues get put in the bottom of the pile of to-do list and are often not prioritized. It is not quite so easy to actually implement all the various practices in terms of energy conservation, water conservation, waste management, nature conservation, etc., as they require both capital investments and knowledge. The company needs to be willing to invest capital in technology as well as human resources. Not all technology has a proven track record yet, so the company needs to be willing to learn by trial and error. Furthermore, it is



## Best Practices in the Accommodation Sector

harder to do in a developing country, such as here in Thailand, as much of the existing technology is not available and there is a lack of knowledge amongst suppliers.

### Success Factors and Benefits

The resort has shown a huge increase in efficiency since implementing the above renewable energy measures. To illustrate, during the resort's inaugural year, with only 35 percent occupancy rates the transformer load was 2MW. Yet, in 2007, despite a much higher occupancy rate of 75 percent, the transformer load was only 1.1 MW.

Six Senses and Evason Phuket have received a great number of awards for their efforts, and have also found peripheral benefits such as increased media exposure and enhanced guest appreciation.<sup>xiv</sup>

### Challenges and Pitfalls

According to Juergen Seidel, Group Director of Property Maintenance, Engineering and Innovation for Six Senses, convincing owners and investors to make the necessary changes can be difficult at times. There is an understanding that many investors in the accommodation sector simply want to support an attractive property that will make them a lot of money. Very often, property managers and operators need initial investments to implement new technologies; if investors and owners do not have a long-term view it is difficult for them to support renewable energy and energy efficiency initiatives.<sup>xlvi</sup>

### Lessons Learned

Seidel is a strong believer in using building management systems for monitoring, recording, and making adjustments, but not for the automation of the entire system. "You have to identify when and where your high demands and peaks are, and then take steps to reduce them," explains Seidel. "That can't be done well enough with an automatic system."<sup>xlvii</sup>

### Case Study: Xanterra Parks & Resorts



Grant Dining Room at Yellowstone ([www.travelyellowstone.com](http://www.travelyellowstone.com))

Xanterra Parks & Resorts (Xanterra) is the largest state and national park concessionaire in the United States. With 23 destinations in 10 states, their operations span the country, from the swamplands of the Everglades to the desert region known as Death Valley. The company employs 8,200 people seasonally in 34 hotels and lodges, 53 retail stores, 65 restaurants, five golf courses, three marinas, and 1,800 campsites.

In terms of best practices, Xanterra has implemented six solar photovoltaic energy systems in national parks across the United States. Xanterra has also implemented a number of energy-conservation initiatives to compliment their renewable energy initiatives. The company uses Automated Logic building management control solutions at two of its facilities. More than 55,000 lighting retrofits have occurred throughout all Xanterra operations. Furthermore, hood controls are utilized on exhaust fans in the company's largest restaurant.

To reduce greenhouse gas emissions, wind power energy is purchased at seven Xanterra facilities. Xanterra participates in the U.S. National Park Service's Climate Friendly Parks Programs to help inventory, track, and reduce greenhouse gas emissions in national parks. The company also partners with the World Wildlife Fund (WWF) and the Center for Energy and Climate Solutions to cut the company's heat-trapping carbon dioxide emissions as part of WWF's Climate Savers initiative.



## Best Practices in the Accommodation Sector

The company uses bio-fuels throughout its operations. Cleaner burning bio-diesel, which is produced from soybeans, is used in boilers at three locations, and kitchen grease is converted to bio-diesel on-site at two locations. The company continues to retrofit and replace fuel oil-powered boilers with cleaner burning alternative fuels, even reducing fuel oil usage at the Grand Canyon National Park to zero by conducting 14 fuel oil-to-propane retrofits. Grease recycling is being undertaken at Mount Rushmore National Memorial and Yellowstone National Park.



Recycling kitchen grease into biofuel  
 (www.xanterra.com)

To address transportation related energy issues, in 2000, Xanterra switched from 'dirty' two-stroke engine technologies in all of its boats and snowmobiles to new four-stroke engines, reducing noise and emissions, and increasing efficiency by 65 percent. Alternative fuels, such as E10 - a blend of 10 percent ethanol, are used to power snowmobiles and snowcoaches. All in-park tour buses at the South Rim of Grand Canyon National Park have hydrous alcohol injectors that decrease visible emissions by 66.4 percent and increase fuel economy by 19.7 percent.<sup>xlviii</sup> Those busses will be replaced over the next several years with propane-fired technologies.

Xanterra's long term goals include slowing global warming by working to reduce emissions of pollutants and gases that can cause climate change; preserving natural resources by promoting improved resource efficiency and reduced energy and water use, as well as maximizing recycling; and minimizing hazardous substances by moving toward progressive and continuous reduction of these substances, leading to eventual phasing out of toxic materials and chemicals.

These practices also contribute to the company's 2015 Environmental Vision Goals of decreasing fossil fuel use by 30 percent, increasing renewable energy use to provide 7 percent of total electricity consumed, decreasing greenhouse gas emissions by 30 percent, and achieving a company-wide Corporate Average Fuel Economy (CAFÉ) standard of 35 miles per gallon for all passenger vehicles purchased annually (among others not energy-related).<sup>xlix</sup>

"As I see it, we really have no choice: businesses must learn to succeed both financially and ecologically. Otherwise, we jeopardize our irreplaceable natural resources, as well as the future generations that depend upon them," explains President and CEO, Andrew N. Todd.

### Background Information on Best Practice – PV System

Xanterra has constructed one of the largest non-utility solar systems in the country – a one megawatt (MW) solar photovoltaic (PV) energy system at their Death Valley operations. In addition, five other on-site systems have been or are in the process of being installed at the following locations: 15 kW at Zion National Park, 2.4 kW at Yellowstone National Park, 2.4 kW coming on at Rocky Mountain National Park, a small remote system at Crater Lake National Park, and a 10 kW renewable energy system (which may be solar PV or a wind turbine) at Maumee Bay State Park in Ohio (installed in Spring of 2008).

### Steps in Implementation

Xanterra's company-wide environmental policy, called Ecologix, signed by the CEO, requires that the company meet and exceed regulatory and voluntary commitments toward pollution prevention, energy efficiency, greenhouse gas emission reductions, and continual improvement. This policy is tied to the company's long-range 2015 Environmental Vision goals. These long-range goals are implemented annually through property-specific environmental management systems that drive energy conservation targets and measures.





## Best Practices in the Accommodation Sector

The company's Vice President of Environmental Affairs and his team of Environmental Affairs Directors, located at each national or state park operation, drive the implementation of each energy conservation, efficiency, or renewable energy project. Implementation of a specific energy efficiency or conservation measure is predicated on a combination of financial and environmental returns on investment on a case-by-case basis.

### Resources Required

Implementation of a specific energy efficiency or conservation measure is predicated on a combination of financial and environmental returns on investment on a case-by-case basis. Environmental staff, as well as property-specific engineering staff, are both required to assess, propose, and implement energy measures. Outside vendors and contractors are engaged when needed.

Solar energy in California, before rebates and incentives costs US\$8-\$10 per watt installed.

### Monitoring and Evaluation

Xanterra tracks its environmental performance through a computerized tracking system called Ecometrix. For their **2008 Sustainability Report (Appendix B)**, Xanterra's internal audit team, led by an internal ISO 14001 auditor, sampled 15 percent of all data points within the Ecometrix system. Data was collected using a random sampling process, and analysis was conducted utilizing utility bills, waste hauling fees, and purchasing receipts. Edited for accuracy – the team found 81 percent of the data to be 100 percent accurate, with the remaining 19 percent within (plus or minus) one percent of the reported numbers. In addition, numerous external parties regularly audit and examine the Ecometrix data and environmental management systems. <sup>i</sup>

### Replicability

Chris Lane, Vice President and Environmental Affairs for Xanterra, strongly supports the growth of solar power use within the marketplace and within company

operations. "In California particularly, it would be foolish not to put solar PV systems everywhere," Lane said. "Given the existing state and utility incentives, it's economic – it pays." In addition to the money saved by reducing energy use, the PV system also greatly reduces emissions, provides a more secure and cleaner system of energy production, and has brought Xanterra great marketing value.

Though the specific resources required to implement the system were not available, Lane noted that the incentives that helped the company make the decision to build it included a 30 percent federal investment tax credit, US\$0.32kWh state rebate, an accelerated appreciation, and of course, energy production. <sup>ii</sup>

### Success Factors and Benefits

The company's one megawatt PV system, operational in April 2008, will instantaneously reduce Death Valley's greenhouse gas emissions by 35 percent and the entire company's emissions by 4 percent. Monetary savings are in similar percentages, resulting in an annual savings of US\$200,000-\$300,000 in energy costs. <sup>iii</sup>



Death Valley solar field (photo courtesy of Chris Lane)

### Challenges and Pitfalls

Xanterra has discovered a number of challenges and pitfalls involved in setting up a PV energy system in Death Valley. "The biggest challenge is the economics," explains Lane. "You have to do a really thorough, internal rate of return economic analysis before deciding to move forward with a project like this. You can't do simple returns, as there are a lot of complex issues with timing of capital replacements – inverters





## Best Practices in the Accommodation Sector

will need to be eventually replaced, equipment must have warranties that last for decades, and so on. Inverters don't like heat, and we're putting them in the hottest place in the country."

"Wind is an issue as well, and to deal with that, the tracking systems put them into horizontal position for protection during high winds. Cleaning the panels can be problematic as well because of dust storms; we'll either have to implement a cleaning system, or clean them manually with our irrigation system. Location has also been an issue. A non-native date tree farm exists where they need to put the panels, so instead of cutting them all down, Xanterra relocated almost all of them, sold the others, and ground the dead and dying ones into mulch to be used under the panels, which will in turn help to reduce dust and debris. Surprisingly, no one wants to look at solar panels, so the relocated trees will also serve to screen them from a surrounding golf course views.



*Close-up shot of concentrated solar panel  
(Photo courtesy of Chris Lane)*

"Finally, going through the administrative process with Southern California Edison and the California Solar Initiative was difficult – as was finding the right solar provider. There are a million solar providers out there, and they all claim that they can do it all. The truth of the matter is that some are good, and some aren't. We're using SPG Solar. Really though, Southern California Edison has been wonderful. They're a wealth

of knowledge, technology, and they'll do anything for you to help you save energy."<sup>liii</sup>

It should also be noted that Xanterra decided to install barbed wire fences to address security matters. There is a golf course in the vicinity, exposing the panels to potential risk of damage by errant balls. The company is currently evaluating either putting up netting, or testing the impact of golf balls on the panels to ensure that no harm can be done.

### Background Information on Best Practice – Building Management Controls

Another one of Xanterra's most effective practices is the use of building management controls. In their Ohio State Park operations, they use Automated Logic, a system of sensors on lights and heating/cooling systems in all areas of their facilities. The Automated Logic system provides a much greater amount of control since the system is not reliant upon human beings in individual areas. It also has the ability to track energy use of each connected subsystem, enabling greater ease of analysis. At Maumee Bay Resort and Conference Center and Salt Fork Resort, for example, it tracks electrical consumption constantly and monitors systems for operational efficiency. Peak load management can be either manual or automatic, allowing engineers access to the system via the Internet so they can control settings and troubleshoot from wherever they are located and have Internet access.

In many of their guest rooms, Xanterra uses Amana Packaged Terminal Air Conditioner units, which feature occupancy sensors and wireless digital thermostats. This system allows for the most efficient energy settings when the guest is not in the room, and can return the room to the guest's preferred settings automatically upon their return. These units last six to seven years, and are much quicker, simpler, and inexpensive than installing the entire Automated Logic system. Xanterra is installing as many of these as they can until the company can afford to change all facilities over to Automated Logic.

Additionally, automatic hood controls are utilized in the kitchens at Mount Rushmore National Monument and



## Best Practices in the Accommodation Sector

are a standalone system. While not connected to Automated Logic, it is an optional feature of the system – nearly anything can be connected to the system.<sup>liv</sup>

### Steps in Implementation

The Automated Logic systems were implemented about six years ago. The process took roughly two years to complete, from the project's inception to turning on the power. Due to today's higher utility costs, Jim Stark, who is involved in Environmental Affairs at Salt Fork Resort, estimates that the decision-making process will not take nearly as long now, reducing total implementation time considerably.<sup>lv</sup>

### Resources Required

The base costs of the required software and computers were approximately US\$5,000. Clients can connect equipment such as boilers and lights to the system that they need to manage, with costs anywhere from US\$1,000 to US\$10,000 extra and based upon complexity. Operational costs are roughly US\$500 per month or less and include a maintenance and service agreement provided by the manufacturer.

The system at Salt Fork Resort was installed in one procedure and the cost was approximately US\$200,000. The Maumee Bay system was installed incrementally, beginning with US\$60,000 and building from there, which showcases a huge advantage of the system – they are modular, so sites can start small and then add components as they are able.<sup>lvi</sup>

### Success Factors and Benefits

The system has allowed a better use of Xanterra's available labor, in turn enabling them to maximize their ongoing maintenance projects. The two facilities that utilize Automated Logic have seen an 18 percent reduction in energy, in combination with other smaller energy-saving practices as well. That 18 percent, however, goes straight to the bottom line and this is significant as it takes a lot of sales to produce that kind of impact.

The preventative maintenance enabled by the system has been significant as well. For example, the furnaces in the cabins at Maumee Bay used to fail periodically in the winter, causing pipes to freeze, in turn creating damage in the affected cabins. Once the company installed Automated Logic, they not only did not have frozen pipes, but they also did not have to send maintenance personnel to check on each cabin every few days. Now when the temperature drops, the system sends an alarm to the manager to check on the furnace.<sup>lvii</sup>

### Challenges and Pitfalls

Physically wiring Automated Logic systems can be challenging, but breakthroughs with wireless technology have greatly reduced the challenges. Many large manufacturers are building control modules into their units that can facilitate hook up to the system. New communications technology (for communication between units) has helped immensely. Instead of being proprietary, one of two systems that are available in the marketplace is used.<sup>lviii</sup>

### Lessons Learned

"It's important to get to know your contractor and the work that they do. Go see the jobs they've completed and the people they work with," cautions Stark. "We spent a lot of time talking to people before we chose ours, and I think it's been a big help."<sup>lix</sup>



Xanterra's solar field ringed by a curtain of trees  
 (Photo courtesy of Chris Lane)



## Best Practices in the Accommodation Sector

### Case Study: Proximity Hotels

Proximity Hotel and Print Works Bistro are named for two cotton mills in Greensboro, North Carolina. The upscale hotel has 147 oversized guest rooms and 10 suites, and boasts one of the largest solar hot water systems in the United States.<sup>lx</sup>



*Proximity Hotel entrance (Photo courtesy of Michael Shore)*

#### Background Information on Best Practice

Hotel developer Dennis Quantaince, Chief Design Officer of Proximity Hotel and President of Quantaince-Weaver Restaurants and Hotels, committed to developing a green hotel when he began work with Proximity. He started working with FLS Energy in the summer of 2006 to design a system that would make sound business sense. Quantaince found that solar hot water could be one of the best opportunities to reduce Proximity's consumption of fossil fuels while meeting 70 percent or more of the hotel's hot water needs. The system they designed uses 100 American-made Alternate Energy Technologies (AET) panels.<sup>lxi</sup>

#### Steps in Implementation

1. Proximity expressed commitment to solar.
2. FLS Energy created a budgetary proposal for Proximity.
3. FLS Energy worked with Proximity architects and engineers to design the system.
4. Proximity committed to the project.
5. FLS Energy coordinated with the general contractor to install the system.
6. The sun now heats the hotel's water.

#### Resources Required

The project is the result of a partnership between Proximity's team (engineers, architects, plumbers, staff, and management) and the design and installation firm, FLS Energy. The project cost the Proximity over US\$400,000, including the expansion of the roof to accommodate more panels. The contractor cost also included all labor and materials to design and install the solar hot water system. Upon completion of the installation, FLS Energy trained Proximity's facilities team in operation and maintenance of the system. Ongoing maintenance costs are anticipated to be minimal over the 30-year expected life of the hot water system.<sup>lxii</sup>

#### Monitoring and Evaluation

Metrima flow and BTU meters were installed to measure the amount of energy generation from the solar hot water system along with a Fats Spaniel monitoring system so that energy generation can be tracked remotely via a dedicated web page. The system can generate hot water as hot as 180° Fahrenheit on sunny days and 140° Fahrenheit on overcast days and is exceeding management's expectations.<sup>lxiii</sup>

#### Replicability

The project is highly replicable for any commercial operation that uses significant amounts of hot water, including hotels and restaurants. Nonetheless, it is important to secure accurate estimates of the hot water usage to ensure a system that is properly sized and designed. Roof penetrations must be made by a licensed roofing contractor to ensure the integrity of the roof and its warrantee. Appropriate planning and engineering work must be performed to ensure the system can withstand the uplift created by strong winds. In addition, the designers should work with the building owner on aesthetics so they can together create a solar hot water system that looks good and is a source of pride.<sup>lxiv</sup>





## Best Practices in the Accommodation Sector

### Success Factors and Benefits

Proximity's solar hot water system saves the hotel about US\$14,000 per year in energy costs. Proximity can also sell renewable energy credits from the project to the local utility to help it meet North Carolina's mandate to secure a portion of its energy from renewable sources. It should also be noted that the project is estimated to reduce greenhouse gas emissions by 71 tons per annum. Significant media attention has also made the Proximity's solar hot water system a visible model nationwide.<sup>lxv</sup>

### Challenges and Pitfalls

One of the biggest challenges involved the coordination of the many players needed to move a project of this scale forward. From suppliers to engineers and architects to Proximity's staff, it took effort to keep all parties aligned and on schedule. Lead staff of the Proximity played an important role to make certain all parties remained on task. The General Contractor, Weaver-Cooke, was also very supportive of the project and helped to certify the solar energy installation was coordinated with other building activity, such as plumbing.<sup>lxvi</sup>



*Cooperation among architects, engineers and Proximity staff result in an outstanding solar system (Photo courtesy of Michael Shore)*

### Lessons Learned

An important lesson that FLS Energy observed is the value of company leadership in enabling a solar project of this scale to be implemented. The hotel's developer,

Dennis Quaintance, clearly expressed his commitment to this solar energy project, which helped to align the many parties needed to move the project forward. During the operations process, FLS Energy also learned to coordinate the ordering and delivery of the 156 pound panels while cranes were still on-site.<sup>lxvii</sup>

### Beta Box: Saunders Hotel Group

The Saunders Hotel Group is a third generation, family business that is often credited with pioneering luxury, urban ecotourism worldwide in the late 1980's. Saunders Hotel Group began unofficially in 1940, when Irving Saunders purchased the Broadway Hotel in Boston's, thriving theater district. The company officially incorporated in 1962 as one of the first independent hotel management companies in the United States.

As part of its comprehensive sustainability campaign over the last 19 years, Saunders Hotel Group has implemented numerous innovative energy-saving initiatives. The company purchases enough solar and wind energy to offset 100 percent of their electricity usage at The Lenox and Comfort Inn & Suites Boston/Airport properties. They were the first hotels certified by CNN, The Climate Neutral Network, offering their guests "Climate Neutral Accommodations."

Their building management initiatives include infrared energy management systems in guestrooms, super-efficient boilers and heat pumps, low-energy windows, motion sensors for lighting in low-traffic areas, motion sensors on vending machines, lighting retrofits, LED exit and roof signs as well as ozone laundry systems that avoid the use of hot water and toxic chemicals. Saunders, The Energy Star Partner of the Year also purchases Energy Star office equipment and televisions. Their Comfort Inn & Suites – Boston Airport purchased three cleaner-burning compressed natural gas airport shuttle vans and one that runs on cleaned waste cooking oil.

Through these initiatives, Saunders annually conserves 110,000 kWh of electricity or enough to power 30 houses for one year. Their solution to managing the



## Best Practices in the Accommodation Sector

upfront costs of major initiatives has been to apply the savings from one initiative to others with longer-term payback.

The practices listed above are part of Saunders Hotel Group's large environmental strategy, the goals of which are to aggressively conserve energy and water, reduce waste, eliminate toxins, and educate their guests, vendors, and team members about environmental concerns.<sup>lxviii</sup> The Comfort Inn & Suites Boston/Airport was selected as The Green Prototype for the entire chain of over 5,000 Choice Hotels International properties. The Lenox's most recent award was being honored as the world's only urban hotel on Condé Nast Traveler magazine's prestigious Green List. Over 17 years they have become the most widely recognized and honored environmental hotel company in the industry because of their early adoption and continuous commitment to leading by example.



*The Comfort Inn & Suites Boston/Airport (www.hotell.com)*

### ADDITIONAL RESOURCES

- Alternate Energy Technologies: [www.aetsolar.com](http://www.aetsolar.com)
- Automated Logic Corporation: [www.automatedlogic.com](http://www.automatedlogic.com)
- BC Hydro, utility company: [www.bchydro.com](http://www.bchydro.com)
- Citizenrē REnU program: <http://renu.citizenre.com/>
- Energen, energy management system: [www.energexinc.com](http://www.energexinc.com)
- EnergyTrac, energy management software from Global Power Products: [www.nappmeters.com/energytrac.html](http://www.nappmeters.com/energytrac.html)
- Energy Star: [www.energystar.gov](http://www.energystar.gov)
- Six Senses Social and Environment Program: [www.sixsenses.com/Environment/index.php](http://www.sixsenses.com/Environment/index.php)
- Fairmont Hotels & Resorts: [www.fairmont.com/EN\\_FA/Environment](http://www.fairmont.com/EN_FA/Environment)
- FLS Energy: [www.flseenergy.com](http://www.flseenergy.com)
- Green Globe 21: <http://www.ec3global.com/products-programs/green-globe/>
- Honeywell, Inc., building management system: [www.honeywell.com](http://www.honeywell.com)
- Home Power article: [www.innserendipity.com/ruralren/homepower.pdf](http://www.innserendipity.com/ruralren/homepower.pdf). A list of additional resources and contacts involved in Inn Serendipity's practices can be found at the end of the aforementioned article.
- Inn Serendipity: [www.innserendipity.com/index.html](http://www.innserendipity.com/index.html)
- Johnson Controls, building management system: [www.johnsoncontrols.com](http://www.johnsoncontrols.com)
- Kill-A-Watt home energy monitor: [www.p3international.com/products/special/P4400/P4400-CE.html](http://www.p3international.com/products/special/P4400/P4400-CE.html)
- Lopi Stoves: [www.lopistoves.com](http://www.lopistoves.com)
- National Park Service's Climate Friendly Parks Program: [www.nps.gov/climatefriendlyparks](http://www.nps.gov/climatefriendlyparks)
- Paradise Bay Villa and Resort Spa: [www.paradisebayresort.net](http://www.paradisebayresort.net); James Post ([jamespost@spiceisle.com](mailto:jamespost@spiceisle.com)), the owner of the resort, is prepared to share information with others and assist them in implementing renewable energy and energy efficiency projects.
- Pepco Energy Services, green energy provider: [www.pepcoservices.com](http://www.pepcoservices.com)



## *Best Practices in the Accommodation Sector*

- Proximity Hotel: [www.proximityhotel.com/green.htm](http://www.proximityhotel.com/green.htm)
- Proximity Hotel's solar hot water system – FLS Energy c/o Michael Shore ([michael@flsenergy.com](mailto:michael@flsenergy.com), 828.582.3141): [www.flsenergy.com](http://www.flsenergy.com)
- Regenerative Solutions - Jeff Oldham has over 30 years experience in alternative energy system design and implementation throughout the US, Caribbean, Latin America: [www.regenerativesolutions.net](http://www.regenerativesolutions.net)
- Saunders Hotel Group: [www.saundershotelgroup.net](http://www.saundershotelgroup.net)
- Saunders Hotel Group's The Lenox Hotel: [LenoxHotel.com](http://LenoxHotel.com)
- Six Senses Resorts & Spas: [www.sixsenses.com](http://www.sixsenses.com)
- Solar Edison: [www.solaredisonllc.com](http://www.solaredisonllc.com)
- SPG Solar, Inc.: [www.spgsolar.com](http://www.spgsolar.com)
- Tiamo Resorts: [www.tiamoresorts.com](http://www.tiamoresorts.com)
- Wind Energy Solutions in Canada: [www.windenergysolutions.ca](http://www.windenergysolutions.ca)
- Wind Energy Solutions in Zijdewind, the Netherlands: [www.windenergysolutions.nl](http://www.windenergysolutions.nl)
- World Wildlife Fund Climate Program: [http://www.panda.org/about\\_wwf/what\\_we\\_do/climate\\_change/index.cfm](http://www.panda.org/about_wwf/what_we_do/climate_change/index.cfm)

## **ACKNOWLEDGEMENTS**

We would like to thank Fairmont Hotels & Resorts, Inn Serendipity, Paradise Bay Villa and Resort Spa, Proximity Hotel, Six Senses Resorts & Spas, Saunders Hotel Group, Tiamo Resorts and Xanterra Parks & Resorts for participating in the Renewable Energy in Tourism Initiative. Please note that Kimpton Hotels declined to participate, and Marriott Hotels and Resorts, Hilton Hotels, and Scandic Hotels did not respond to the invitation to participate in the initiative. Also note that other hotels were interviewed, at which time it was discovered that they were not engaging in noteworthy best practices related to the initiative.

The authors wish to acknowledge each of these businesses' participation. In most instances, the background information and best practices highlighted were taken from direct communications with these participants or obtained from affiliated Web sites.

### **Credits**

The Renewable Energy in Tourism Initiative (RETI) is a joint venture whose partners include the University of Colorado's Energy Initiative (EI), the North Carolina Center for Sustainable Tourism (NCCST) at East Carolina University (ECU), and the National Renewable Energy Laboratory (NREL).

Sustainable Travel International was subcontracted by the above partners as the lead author of the RETI best practices series, with guidance provided by an industry advisory board. Board members include Mr. Chris Adams, Director of Online Marketing, Miles Media, Inc. and Mr. Tim King, Program Manager, Colorado State Parks. Coordination for the RETI project has been provided by Tara Low and Wendy Kerr, Leeds School of Business, University of Colorado at Boulder. Principle Investigators for the project include Dr. Patrick Long, Director, NCCST and David Corbus, Senior Mechanical Engineer, National Wind Technology Center, NREL.

The best practices are a collaborative effort, and final information reflects consensus from the editorial board and contributors. Further contributions are welcomed from all industry members, should be merit- and science-based, with participation being nonexclusive.





## REFERENCES

- i Marge O'Connor "Bright Ideas - Saving Energy Improves Guest Comfort and Bottom Line", Eco-structure Magazine, March, 2006.
- ii [www.fairmont.com/EN\\_FA/AboutFairmont/AboutFairmont.htm](http://www.fairmont.com/EN_FA/AboutFairmont/AboutFairmont.htm)
- iii <http://oee.nrcan.gc.ca/publications/infosource/pub/ici/eii/OEE2929.cfm?attr=20>
- iv Fairmont Case Studies.doc (sent by Michelle White, 12/03/2007)
- v Fairmont Green Partnership Brochure. [http://www.fairmont.com/NR/rdoonlyres/EAB55F14-A593-4CA8-BB42-CCF963AE4A8E/0/fhr\\_greenpartnership.pdf](http://www.fairmont.com/NR/rdoonlyres/EAB55F14-A593-4CA8-BB42-CCF963AE4A8E/0/fhr_greenpartnership.pdf)
- vi <http://oee.nrcan.gc.ca/publications/infosource/pub/ici/eii/OEE2929.cfm?attr=20>
- vii <http://www.hotelsmag.com/archives/2007/03/technology.asp>
- viii Fairmont Case Studies.doc, 12/03/2007
- ix Dawn Ringrose & Associates, Inc. "Excellence in the Canadian Tourism Industry", February, 2005. Available at [www.dawnringrose.com/PDF/TIAC%20Report.pdf](http://www.dawnringrose.com/PDF/TIAC%20Report.pdf)
- x Fairmont Case Studies.doc, 12/03/2007
- xi <http://oee.nrcan.gc.ca/publications/infosource/pub/ici/eii/OEE2929.cfm?attr=20>
- xii Fairmont Case Studies.doc, 12/03/2007
- xiii <http://oee.nrcan.gc.ca/publications/infosource/pub/ici/eii/m144-11-2003e.cfm?attr=20>
- xiv Ivanko, John and Lisa Kivirist. "Inn Serendipity: Sustainability as the Bottom Line". *Home Power*, Vol. 102, August and September 2004, [www.innserendipity.com/ruralren/homepower.pdf](http://www.innserendipity.com/ruralren/homepower.pdf)
- xv John Ivanko, Owner, Inn Serendipity, Telephone interview, 11/25/2007.
- xvi Ivanko, 2004.
- xvii Ivanko, 11/25/2007.
- xviii [www.innserendipity.com/inn/carbonsequest-2006.html](http://www.innserendipity.com/inn/carbonsequest-2006.html)
- xix Ivanko, 2004.
- xx Ibid.
- xxi Ivanko, 11/25/2007.
- xxii Ibid.
- xxiii From various documents provided by James Post, Owner, 11/22/2007.
- xxiv James Post, Owner, Paradise Bay Villa Resort and Spa, Telephone interview, 11/22/2007.
- xxv Post, 11/22/2007.
- xxvi Post, James. "Grenada Energy: Don't Stop the Windmill". *Caribbean Property Magazine*, Issue 4, May 2007. [www.caribpro.com/Caribbean\\_Property\\_Magazine/index.php?pageid=102](http://www.caribpro.com/Caribbean_Property_Magazine/index.php?pageid=102)
- xxvii James Post, Owner, Paradise Bay Villa Resort and Spa, Telephone interview, 11/26/2007.
- xxviii Ibid..
- xxix Ibid.
- xxx Ibid.
- xxxi Post, May 2007
- xxxii Post, 11/22/2007.
- xxxiii [www.tiamoresorts.com](http://www.tiamoresorts.com)
- xxxiv Michael Hartman, President, Tiamo Resorts, Telephone interview, 11/20/2007, and [www.tiamoresorts.com/tiamo/sustainableTourism.cfm](http://www.tiamoresorts.com/tiamo/sustainableTourism.cfm)
- xxxv Hartman, 11/20/2007.
- xxxvi Ibid.
- xxxvii Ibid.
- xxxviii Ibid.
- xxxix [www.sixsenses.com](http://www.sixsenses.com)
- xl Green Globe Case Study on Evason Phuket, available at [http://www.sixsenses.com/Evason-Phuket/Downloads/PDF/GG\\_EPR.pdf](http://www.sixsenses.com/Evason-Phuket/Downloads/PDF/GG_EPR.pdf)
- xli Juergen Seidel, Group Director of Property Maintenance, Engineering and Innovation, Six Senses Resorts and Spas, and Arnfinn Oines, Environment Coordinator, Evason Phuket and Six Senses Spa, Telephone interview, 11/29/2007.
- xlii Ibid.
- xliiii Ibid.
- xliv Ibid.
- xlv Ibid.
- xlvi Juergen Seidel, Group Director of Property Maintenance, Engineering and Innovation, Six Senses Resorts and Spas, and Arnfinn Oines, Environment Coordinator, Evason Phuket and Six Senses Spa, 11/29/2007.



xlvi Ibid.

xlviii Xanterra Parks & Resorts 2008 Environmental Sustainability Report available at <http://www.xanterra.com/Environmental-Action-364.html>

xlx Ibid.

I Ibid.

ii Chris Lane, Vice President of Environmental Affairs, Xanterra Parks & Resorts Parks and Resorts, Telephone interview, 11/21/2007.

iii Xanterra Parks & Resorts 2008 Environmental Sustainability Report  
 Chris Lane, 11/21/2007.

liv Jim Stark, Environmental Affairs, Salt Fork Resort & Conference Center, Xanterra Parks & Resorts Parks and Resorts, Telephone interview, 11/26/2007.

lv Ibid.

lvi Ibid.

lvii Ibid.

lviii Ibid.

lix Ibid.

lx [www.proximityhotel.com](http://www.proximityhotel.com)

lxi Proximity Hotel Questionnaire, and Michael Shore, MCE, MS, FLS Energy, Telephone interview, 12/5/2007.

lxii Ibid.

lxiii Ibid.

lxiv Ibid.

lxv Ibid.

lxvi Ibid.

lxvii Ibid.

lxviii The Saunders Hotel Group's Winning Application for the 2006 SKAL International Ecotourism Awards

# Inn Serendipity



Photos © John D. Ivanko



**A** business pursuit need not be motivated by “bigger is better,” or always selling more products or services. Being successful can be based on generating enough revenue to cover your costs and leave you with enough profit to satisfy your needs, pay the property taxes, and for renewable energy enthusiasts like us, take some time off during the summer and attend an energy fair or two.

## *Sustainability as the Bottom Line*

**John Ivanko and Lisa Kivirist, with Phil and Judy Welty**

©2004 John Ivanko and Lisa Kivirist



We call it equilibrium economics. It's been our ticket to the good life while operating a portfolio of small businesses, including Inn Serendipity Bed and Breakfast and a marketing and creative services consulting company. Both are operated from our five-and-a-half-acre farm located in southwestern Wisconsin.

When it comes to energy, the more we can conserve, use more efficiently, or generate ourselves, the better our bottom line. We strive to avoid waste in our bed and breakfast kitchen and in our home-office, and we explore ways to use readily available renewable energy (RE) resources—sunlight, wind, and locally abundant wood. Our goals are to be fossil-fuel free and produce net zero emissions when combined with other carbon-dioxide sequestering activities, like planting trees.

We're not reading by kerosene lamps or hand-cranking our telephone. Our home office has enough computer power to scan and store John's professional photos, prepare a book manuscript, and complete a marketing plan. The two-room bed and breakfast has most of the amenities you'd expect in an 80-year-old, 1,969 square foot (183 m<sup>2</sup>) farmhouse turned hospitality business, like a bedside clock and lamp—and hot showers.

In both our home-based business and lifestyle, energy conservation and the addition of energy-efficient appliances were among the many steps we took before moving into generating our own electricity. We purchased a Sun Frost refrigerator, Maytag Neptune front-loading washer (we line dry laundry), and several other Energy Star appliances. Our KitchenAid convection oven saves electricity by reducing cooking times. Phantom loads are eliminated with switched power strips. An old vertical freezer was replaced by a Frigidaire chest unit and placed in the cool northeast corner of the basement, rather than adjacent to the oven in the kitchen where it had been previously.

**The solar thermal system for Inn Serendipity's straw bale greenhouse, with dairy barn in background, now home to two llamas.**



Photo © John D. Ivanko



Photo © Mick Sagrillo

**View of the Inn Serendipity farmstead from atop the 120 foot, guyed, lattice tower for the 10 KW Bergey wind turbine.**

### *Interconnected RE Systems*

Nature is our model. It guides us in our organic kitchen gardens, from which we harvest about seventy percent of our food. It illuminates our pathway toward more self-reliant and ecologically mindful living. Our decisions related to employing renewable energy systems were no different. All our RE systems were added incrementally, as budgets permitted. The evolution of the once fossil-fuel-based farm to an organic, sun and wind powered Inn Serendipity homestead is explained in our book, *Rural Renaissance: Renewing the Quest for the Good Life*.

Our first entry into renewable energy systems, paralleling our energy conservation efforts, was to add a solar thermal system for domestic hot water, and two years later, a woodstove for heat in the winter. Next we developed a grid-intertied hybrid renewable energy system using both solar and wind electricity generation, which lets us produce all of our electricity on an annual basis. Excess electricity generated, coming as a credit from our utility, is used to offset summer electricity use and anticipated maintenance costs for the entire hybrid RE system.

To become eco-effective, our frugal lifestyle needs to complement our goals to generate more electricity than we use in our all-electric home and business. Our electricity use was reduced about 40 percent from that of the previous owners, now averaging about 8,500 KWH per year for home, business, and farm. Soon we'll be exploring ways to achieve net zero

emissions with our car and other transportation. Our ten second walking commute to our office on the second floor was our first step.

## Capturing Heat from Sunlight

Recognizing that 10 to 15 percent of an average home's energy use goes toward heating water, we added a domestic solar hot water system. Three, 4 by 8 foot (1.2 x 2.4 m) flat-plate American Solar King collectors were installed on our south-facing roof at about a 45 degree angle, optimized for spring and fall solar gain. Our collectors, like so many of our other systems, are experiencing a second life. They had previously been installed on the Packerland meat processing facility in Green Bay, Wisconsin. We're proponents of the reuse and recondition economy.

Nontoxic propylene glycol is used in our closed-loop active solar thermal system. A Heliotrope DTT-84 differential temperature controller senses when the collector fluid is hotter than the water in the basement storage tank. A super-efficient Grundfos 1/12 hp pump circulates the fluid through a Quad Rod heat exchanger where the heat is transferred to our domestic water.

The hot water is stored in a standard 80 gallon (300 l) Rheem water tank that is connected to our existing 65 gallon (250 l) electric water heater tank. Had we to do it over, we would have mounted the collectors on the ground for easier installation and winter access (to brush off snow).

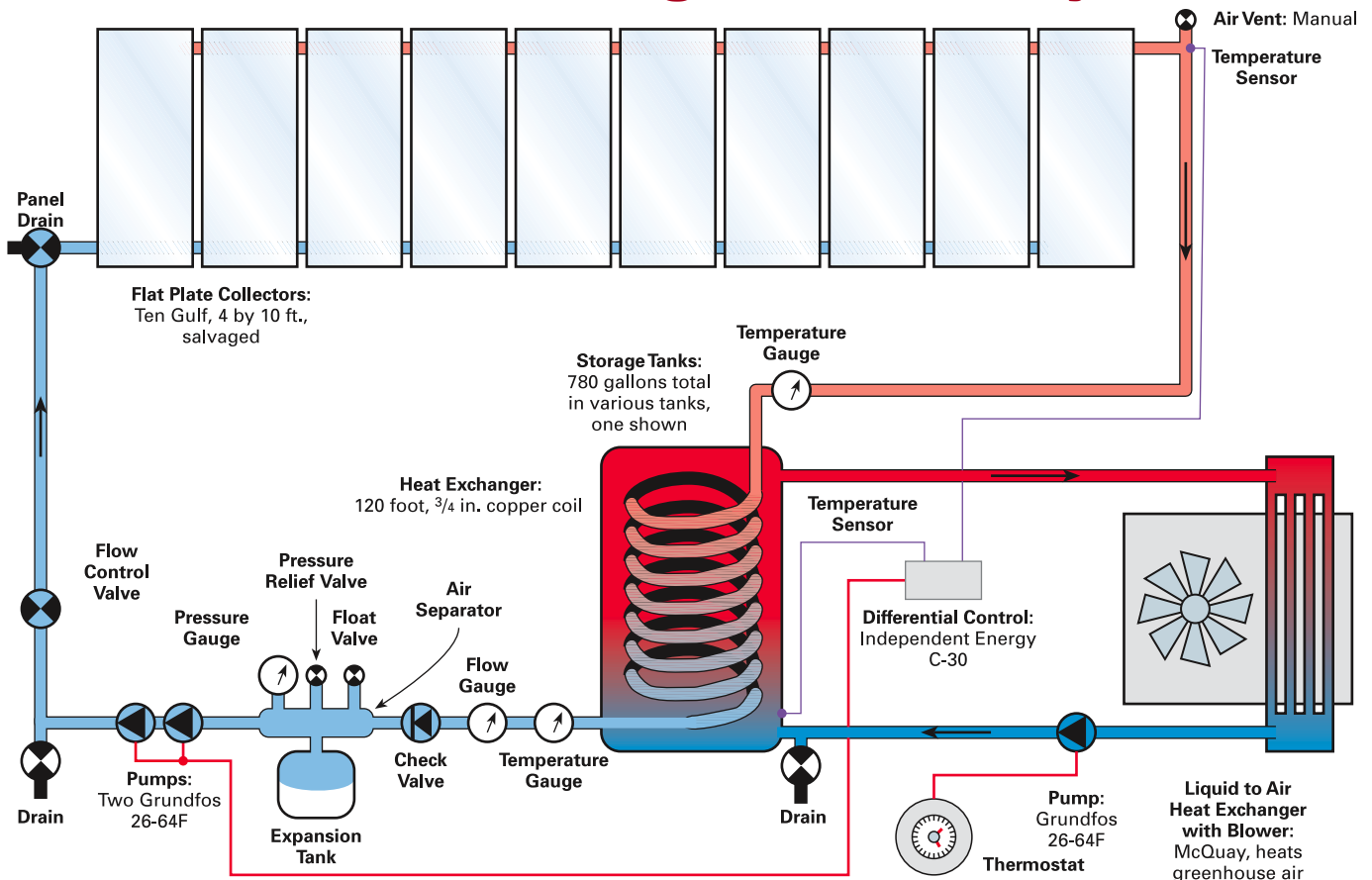
## Thermal Systems Costs

SDHW System	Cost (US\$)
Hired labor	\$928
3 Solar King collectors, 4 x 8 ft. (used)	750
Misc. plumbing	396
Copper pipe, 3/4 in., 100 ft.	360
Quad Rod heat exchanger	287
Mount for collectors	225
Grundfos circulation pump, 1/12 hp	187
Freight	187
Water tank, 80 gal.	128
Heliotrope DTT-84 controller	117
Sales tax	113
Extrol #30 expansion tank	91
<b>Total SDHW System</b>	<b>\$3,769</b>

## Wood Heating System

Chimney system	\$994
Lopi Endeavor woodstove	900
Terra Green recycled glass tiles	66
Hired labor	1,352
<b>Total Wood Heating System</b>	<b>\$3,312</b>

## Greenhouse Solar Heating & Hot Water System



## Thermal Costs, cont.

Greenhouse Solar Heating System*	Cost (US\$)
10 Gulf solar collectors, 4 x 10 ft. (used)	\$5,475
Misc. plumbing, insulation, etc.	901
Desert Sun fiberglass tank, 700 gal.	855
10 Gulf mounting frames	650
Heat recovery ventilation system	380
2 Grundfos 26-64F pumps	360
Blower	345
McQuay heat exchanger, 20 x 19 in.	315
10 Posts, 4 x 4 in, 12 feet	180
Glycol antifreeze, 20 gal.	180
Independent Energy C-30 control	143
Heat exchanger (for hot tub)	140
Storage tank, 82 gal.	128
Solar tank, 250 gal. (hot tub)	115
Thermostat (for storage tank)	105
March pump	104
Circulating pump (for hot tub)	100
Controller (for hot tub)	49
Flow indicator	42
Expansion tank	36
Phase change salts storage	33
<b>Total Solar Heating</b>	<b>\$10,634</b>
<b>Total Heating Systems Costs</b>	<b>\$17,716</b>

### Owner/Volunteer Labor Estimates

Solar heating system	\$8,400
SDHW system	495
Wood heating system	150
<b>Total Installation Labor Estimates</b>	<b>\$9,045</b>
<b>Total Costs with Labor</b>	<b>\$26,761</b>

### Rebates & Grants

Alliant Energy Corp. (utility)	-\$3,000
<b>Grand Total</b>	<b>\$23,761</b>

\* Items mostly from old, reused system; costs estimated & adjusted to present-day amounts.

The solar thermal system for the 1,200 square foot (111 m<sup>2</sup>) greenhouse, designed by our neighbors Phil and Judy Welty, collects heat with ten, 4 foot by 10 foot (1.2 x 3 m) Gulf collectors, also reused from previously dismantled systems. The greenhouse itself is a renovated corncrib and granary, with two-thirds of the structure using straw bales as insulation material surrounded by more than 2 inches (5 cm) of stucco.

The heated glycol solution is pumped through underground insulated piping into a heat exchanging coil of 120 feet (37 m) of 3/4 inch copper piping. This allows the heat to be transferred and stored in 780 gallons (2,950 l) of water in several fiberglass tanks inside the greenhouse. The stored heat is then transferred to the air inside the greenhouse through a McQuay liquid-to-air heat exchanger.

In the middle of the winter, with the collectors angled at about 52 degrees for optimal solar gain, about 240,000 BTUs can be collected each sunny day. So when it's a frigid but sunny 10°F (-12°C) outside, the collectors will heat up the water tanks inside to more than 90°F (32°C). The goal and on-going experiment with the greenhouse is to have a net zero heating cost by using both passive and active solar thermal systems, passive solar design, and the super-insulating qualities of straw bale walls. As much as 45 percent of the annual operation cost in traditional greenhouses is associated with heating. Successfully growing with net zero heating cost means more profit per vegetable or fruit crop sold.

### Solar Electricity

Generating electricity using renewable energy for our home and business came in two phases—sun and wind. First, we installed a 480 watt PV system, estimated to generate about 500 KWH per year. Four, 120 watt Kyocera PV panels were mounted on a UniRac fixed rack that we attached to the south-facing wall of an existing equipment shed. The tilt angle of the rack is adjusted four times a year, roughly midway between the equinoxes and solstices.

Installation crew for the 480 watt PV system that was part of the Midwest Renewable Energy Association's educational workshop.



Photo © John D. Ivanko



The PV system was a part of an installation workshop with the Midwest Renewable Energy Association (MREA). Students ran a short DC line through the wall into an Advanced Energy, Inc., 1,000 watt inverter, and tied it into the nearest breaker box in the equipment shed. We sized our inverter to allow us to expand our system to include additional modules.

## Wind Electricity

Sitting high on the ridge where we can see for many unobstructed miles in every direction, our farm is well positioned for electricity generation with a wind turbine. A partially state-funded site assessment was completed by Mick Sagrillo of Sagrillo Power and Light. He estimated that a 10 KW Bergey Excel-S system, with our annual wind speed of 13 mph (5.8 m/s) at the tower height of 120 feet (37 m), would generate about 1,130 KWH per month, or 13,560 KWH per year.

Our last, and most significant, investment in renewable energy generation was completed in May 2003 when we added this turbine, also as an MREA educational workshop. Lake Michigan Wind and Sun rebuilt a used Bergey that we had purchased, with any parts most likely to wear out replaced with new ones.

Our public utility, Alliant Energy, required a simple contract, certificate of liability insurance in excess of

## PV System Tech Specs

### System Overview

**System type:** Batteryless grid-intertied PV

**Location:** Browntown, Wisconsin

**Solar resource:** 4.5 average daily peak sun hours

**Production:** 44 AC KWH per month average estimated

**Utility electricity offset by PV system:** 6 percent

### Photovoltaics

**PV:** Four Kyocera KC-120, 120 W STC, 12 VDC

**Array:** 480 W STC, 48 VDC

**Array combiner box:** Inverter integrated, 10 A series fuse

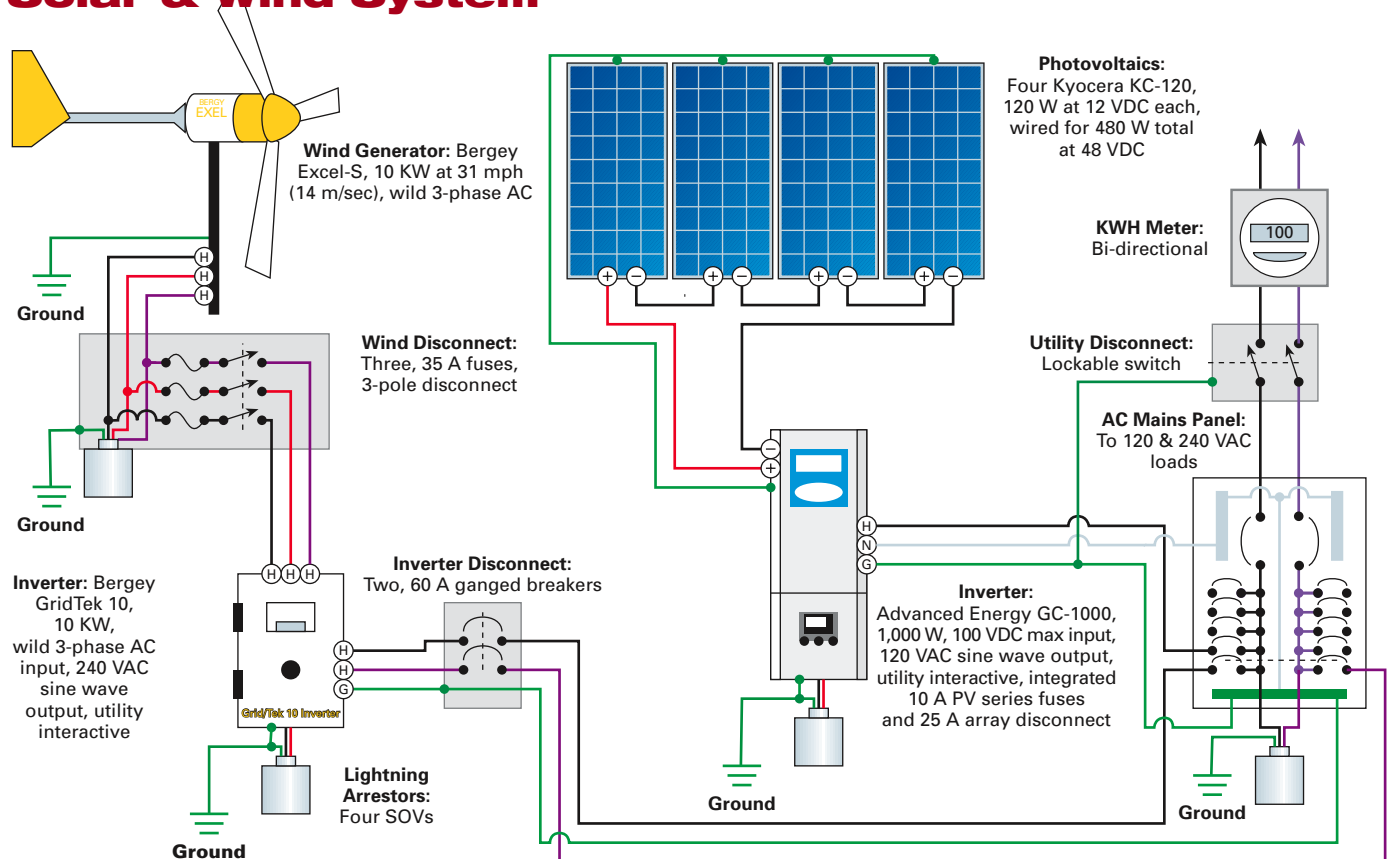
**Array disconnect:** Inverter integrated, 25 A

**Array installation:** Wall-mounted UniRac SolarMount, oriented true south; adjustable tilt angle

### Balance of System

**Inverter:** Advanced Energy, Inc. GC-1000, 100 VDC maximum input, 120 VAC output, 52–92 VDC MPPT window

## Solar & Wind System



Note: All numbers are rated, manufacturers' specifications, or nominal unless otherwise specified.

## Wind System Tech Specs

### System Overview

- System type:** Grid-tied, batteryless wind
- Wind resource:** 13 mph (5.8 m/s) annual average
- Production:** 7,049 KWH for first year
- Utility electricity offset:** Projected in excess of 100 percent
- Wind turbine:** Bergey (BWC) Excel-S
- Rotor diameter:** 23 feet (7 meters)
- Energy output:** 900 AC KWH at 12 mph (5.4 m/s) average per month (grid-tied)
- Power output:** 10 KW @ 31 mph (14 m/s) peak
- Tower:** 120 foot (37 m) Rohn, guyed, lattice

### Balance of System

- Inverter:** Excel-S GridTek 10 Power Processor, wild 3-phase AC input, 240 VAC output
- System performance metering:** AC KWH meter and integrated inverter LCD display



Photo © John D. Ivanko

**Inn Serendipity's grid-intertied, hybrid electric system features a 10 KW Bergey wind turbine on a guyed, lattice tower.**

US\$300,000, equipment specification sheets, and a lockable external AC disconnect for the project. The only unanticipated aspect of the system came with the computations contained in our first "credit" electric bill in December 2003. While we have a bi-directional meter, we are only able to "bank" (and get a credit for) our excess generation at Alliant Energy's retail rate, not the "green energy" rate, due to the way green energy is purchased by our utility.

**The MREA installation class in front of the 10 KW Bergey turbine and tower prior to being raised.**



Photo © John D. Ivanko

### Heating with a Woodstove

We don't mind getting snowed in with our Lopi Endeavor woodstove ablaze, using dry, seasoned, hardwoods that are readily available locally. We can snuggle self-sufficiently around the stove, strategically placed between our kitchen and front room. By using this efficient, high-tech, noncatalytic woodstove, our winter heating bill plummeted, conversations around the hearth mushroomed, reliance on fuel oil largely disappeared, and environmental impacts lessened.

According to the Midwest Renewable Energy Association, the cycle of burning wood and regrowth of trees produces no net increase in carbon dioxide to the atmosphere. We make sure our tree planting efforts more than replace the trees that we end up burning.

The Lopi stove is among the cleanest burning large stoves ever tested, in part because of the use of fire brick and baffles, which ensure that the gases are burned in the

## Electrical System Costs

Wind Turbine System & Workshop	Cost (US\$)
Bergey Excel-S 10 KW wind genny, lattice tower, & GridTek 10 inverter (used or rebuilt)	\$23,000
Excavation	1,668
Sales tax	1,348
Utility service upgrades	1,324
Tower wiring kit	950
MREA workshop costs	716
Shipping	566
Wire run to tower	485
Permits	438
Crane rental	422
Misc. hardware	158
<b>Total Wind System Costs</b>	<b>\$31,075</b>

### PV System

4 Kyocera PV modules, 120 W	\$2,680
AE, Inc. GC-1000 Inverter	1,785
Misc. electrical (wire, etc.)	326
UniRac U-LP/106 PV rack	250
Sales tax	244
Freight	142
Misc. hardware	55
PV wiring	45
<b>Total PV System Costs</b>	<b>\$5,527</b>
<b>Total Electrical System Costs</b>	<b>\$36,602</b>

### Owner/Volunteer Labor Estimates

Wind system	\$8,390
PV system	2,825
<b>Total Installation Labor Estimates</b>	<b>\$11,215</b>
<b>Total Costs with Labor</b>	<b>\$47,817</b>

### Rebates & Grants

WI Focus on Energy (wind system)	-\$15,595
WisconSUN (PV system)	-3,000
WI Focus on Energy (PV system)	-536
<b>Total Rebates &amp; Grants</b>	<b>-\$19,131</b>
<b>Grand Total</b>	<b>\$28,686</b>

combustion chamber. The combustion air is preheated along the sides of the firebox, and the five-sided convection chamber surrounding the firebox draws in cool room air, circulates it around the outside of the firebox, and returns heated air to the room.

The new woodstove models have up to 75 percent fewer emissions according to the EPA, which implemented woodstove standards in 1990. In contrast, an open fireplace sends up to 80 percent of a fire's heat up the chimney and significantly contributes to air pollution because of incomplete combustion of gases. The key to burning wood cleanly is burning all the gases that the wood releases. These are not only dangerous if left unburned, but contain more than 50 percent of the available energy. The gases burn only at temperatures in excess of 1,100°F (593°C), which can rarely be achieved other than through modern, airtight woodstoves.

### Passive Solar Redesign & Daylighting

Passive solar features capture the heat of the sun entering our house. Daylighting allows sunlight to naturally light a space or room, and reduces the need for electric lighting. We employed daylighting when remodeling our attic, and used passive solar design as much as possible in the greenhouse. Our attic remodel involved the addition of a south-facing dormer with low-emissivity (low-E), gas-filled, double-pane Andersen windows. Overhangs above the attic windows help shade them from the hot summer sun.

In the greenhouse, extra thermal mass in the concrete slab floors, a 250 gallon (950 l) water tank, a phase-change salt tube, and water-filled Sun-Lite thermal storage tubes,

## Energy Independence & Community Interdependence

We're not tinkerers. Nor are we financially independent. Our systems were selected based upon their reliability, affordability, and the recommendations from the "hired hands" who made our renewable energy journey possible. We chose some of the seasoned and experienced designers, consultants, and dealers that served our state.

Our success in employing the RE systems would not have been possible without these experienced guides, plus numerous neighbors pitching in with a tractor or construction expertise, and MREA's installation workshops. Various statewide funding programs helped us to the tune of US\$19,131. In our quest for energy independence, we rediscovered social and community interdependence.



each in their own way, absorb and store extra heat, which slowly radiates at night.

Sun-Lite thermal storage tubes, made from fiberglass-reinforced polyester, resemble cylindrical fish tanks. They, like the phase-change salts, passively collect and store heat, which is then slowly released at night. The 250 gallon (950 l) open water tank takes advantage of the same passive heat-capturing opportunity, doubling as our hot tub. The water for the hot tub is made safe by an ultraviolet light placed next to the transparent filter canister.

## *Being Part of the Solution*

Adding renewable energy systems goes beyond saving energy and reducing our ecological footprint. These are some of the many advantages.

**Direct energy savings.** Our hybrid wind and solar-electric system should offset about US\$1,000 in electricity bills paid each year.

**Tax credits and accelerated depreciation** (for businesses only). Cash in on the federal renewable energy tax credit of US\$0.018 per KWH generated for wind, or 10 percent tax credit for solar energy equipment. You can also accelerate the amortization for the system with the federal modified accelerated cost recovery system (MACRS; Section 169 of the Internal Revenue Code). Consult your tax advisor for the latest information.

**Magnet for visitors and a competitive advantage.** We are one of the few bed and breakfasts in the world powered by renewable energy—guests choose us over other lodging options because of our concern for the environment.

**Free advertising.** In nearly every significant renewable energy system addition (wind turbine, PV system, straw bale greenhouse, and solar thermal systems), we found an interested and engaged media, eager to report on our sustainable living methods.

**Operating cleaner and greener.** Our decision to use renewables was more than about the economics of energy, since reducing carbon dioxide, nitrous oxide, and mercury emissions and achieving greater energy self-reliance were just as important. It's a matter of operating our business as responsibly as possible, given financial limitations.

Economics and the environment do go hand-in-hand. It comes down to our understanding that the health of our community and success of our business is connected in much the same way as our physical health is based on what we eat and drink. In striving for a more ecologically responsible model of conducting our business that sustains



**An old granary and corncrib was reconstructed as a straw-bale-insulated greenhouse with the help of neighbors, friends, and installation workshops by the Midwest Renewable Energy Association.**



Photos © John D. Ivanko



Photo © Jason Perry

**Wind and sun farmers Lisa Kivirist and John Ivanko with their son, Liam, next to the perennial flower bed at Inn Serendipity Bed and Breakfast.**

us and provides our livelihood, we discovered how to harness renewable energy and greater profits for our business.

## Access

John Ivanko and Lisa Kivirist, Inn Serendipity Bed & Breakfast, 7843 County P, Browntown, WI 53522 • 608-329-7056 • info@innserendipity.com • www.innserendipity.com

*Rural Renaissance: Renewing the Quest for the Good Life*, John Ivanko and Lisa Kivirist, 2004, ISBN 0-86571-504-1, 304 pages, US\$22.95 from New Society Publishers, PO Box 189 Gabriola Island, BC V0R 1X0 Canada • 800-567-6772 or 250-247-9737 • Fax: 250-247-7471 • info@newsociety.com • www.newsociety.com

Rural Renaissance Network (RRN), PO Box 811, Monroe, WI 53566 • www.ruralrenaissance.org • Nonprofit program of Renewing the Countryside, supporting sustainable living and livelihood in rural communities

Mick Sagrillo, Sagrillo Power & Light, E3971 Bluebird Rd., Forestville, WI 54213 • 920-837-7523 • msagrillo@itol.com • MREA wind workshop instructor

John Hippensteel, Lake Michigan Wind & Sun, 1015 County Rd. U, Sturgeon Bay, WI 54235 • 920-743-0456 • Fax: 920-743-0466 • info@windandsun.com • www.windandsun.com • Wind turbine supplier

Bob Ramlow, Artha Renewables, 9784 County Rd. K, Amherst, WI 54406 • artha@wi-net.com • Solar thermal consultant

Chris LaForge, Great Northern Solar, 77480 Evergreen Rd. Suite #1, Port Wing, WI 54865 • Phone/Fax: 715-744-3374 • gosolar@cheqnet.net • MREA PV workshop instructor

Chris and Ken Hulet, Engineering Services Co., 21025 Hwy. 78, Blanchardville, WI 53516 • 877-417-4610 or 608-523-3726 • Fax: 608-523-3727 • esco@revolutionearth.com • www.revolutionearth.com • Consultation and PV equipment

Matt Sterling, Native Earth Construction, c/o MREA, 7558 Deer Rd., Custer, WI 54423 • Straw bale builder and MREA straw bale workshop instructor

Database of State Incentives for Renewable Energy (DSIRE) • www.dsireusa.org

Midwest Renewable Energy Association (MREA), 7558 Deer Rd., Custer, WI 54423 • 715-592-6595 • Fax: 715-592-6596 • info@the-mrea.org • www.the-mrea.org • RE fair and workshops

Andersen Windows, Inc., 100 Fourth Ave. N., Bayport, MN 55003 • 800-426-7691 or 651-264-5150 • Fax: 651-264-5279 • commercialgroup@andersenwindows.com • www.andersenwindows.com • Efficient windows

Travis Industries, 4800 Harbour Pointe Blvd. SW, Mukilteo, WA 98275 • 800-654-1177 or 425-609-2500 • Fax: 425-609-2781 • stoveinfo@travis-inc.com • www.lopi-stoves.com • Lopi and other woodstoves

Solar Components Corp., 121 Valley St., Manchester NH 03103 • 603-668-8186 • Fax: 603-668-1783 • solarcomponents@yahoo.com • www.solar-components.com • Sun-Lite thermal storage tubes



## The BEST Tool for Solar Site Analysis

**Easy to Use**

Ingenious design projects your horizon onto a sun chart for the full year.

Perfect for optimal siting of:

- Photovoltaic Arrays
- Solar Hot Water Systems
- Solar Homes
- Greenhouses
- Gardens

Includes sun paths from 0–66° North & 0–49° South. With metal case & tripod \$255, Handheld \$175, (+S&H).

**Fast & Accurate**

Rt 1 Box 260-1,  
Linden, TN 37096  
317 501-2529

info@solarpathfinder.com • Fax 931-589-5400



www.solarpathfinder.com




**ROOM COPY:** Help save a tree by leaving this behind for future guests.

# 2008 ENVIRONMENTAL SUSTAINABILITY REPORT

*Xanterra*  
PARKS & RESORTS®

*ecologiX*  
Xanterra's Environmental Commitment





**YELLOWSTONE** National Park  
**SOUTH RIM** of the Grand Canyon  
**BRYCE CANYON** National Park  
**ZION** National Park  
**CRATER LAKE** National Park  
**DEATH VALLEY** National Park  
**PETRIFIED FOREST** National Park  
**EVERGLADES** National Park  
**MOUNT RUSHMORE** National Memorial  
**GRAND CANYON** Railway  
**ROCKY MOUNTAIN** National Park  
**SILVERADO RESORT** in Napa, CA  
**FURNACE CREEK** Inn & Ranch  
**SALT FORK** State Park  
**MAUMEE BAY** State Park  
**SHAWNEE** State Park  
**BURR OAK** State Park  
**PUNDERSON MANOR** State Park  
**HUESTON WOODS** State Park  
**MOHICAN** State Park  
**GENEVA** Marina

***“Nature is our home. And just as we take care of our house, we also must take care of nature. But nature takes care of us too. Nature cleans our air and water, makes the soil that grows our food and provides the resources to make all our***

***material goods. Unfortunately, with six billion of us now living under one roof, we are gradually eroding the services nature provides - even though we depend on them for our quality of life and our future.”***

**David Suzuki, Environmental Scientist**

# TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>2</b>	<b>ENVIRONMENTAL PERFORMANCE</b>	<b>17</b>
<b>COMPANY PROFILE</b>	<b>3</b>	Greenhouse Gas and Criteria Air Pollutant Emissions	17
Who We Are	3	Fossil Fuel Energy	20
Changes at Xanterra	3	Renewable Energy	25
Corporate Structure	3	Solid Waste	30
Trends in the Parks and Tourism Business	4	Hazardous Waste	32
Environmental Impact of Tourism	5	Transportation	34
<b>REPORTING METHODOLOGY</b>	<b>6</b>	Sustainable Design and Construction	36
Scope of this Report	6	Water	38
Verification of this Report	6	Environmentally Preferable Procurement	39
Ecometrix Tracking System	7	Sustainable Cuisine	40
<b>MESSAGE FROM THE PRESIDENT AND CEO</b>	<b>8</b>	Communication and Education	42
<b>LONG TERM ENVIRONMENTAL GOALS</b>	<b>10</b>	Corporate Social Responsibility	43
Summary of Environmental Performance	11	Partnerships	45
Progress Toward Xanterra's 2015 Environmental Vision Goals	11	Compliance	46
Progress Toward Meeting President Bush's New Executive Order	12	<b>LETTER FROM VICE PRESIDENT OF ENVIRONMENTAL AFFAIRS</b>	<b>47</b>
<b>ENVIRONMENTAL HIGHLIGHTS</b>	<b>13</b>	<b>AWARDS AND CERTIFICATIONS</b>	<b>48</b>
<b>POLICIES AND MANAGEMENT</b>	<b>14</b>		
Xanterra's Environmental Policy	14		
Verification of Environmental Management System	15		
International Organization of Standardization (ISO 14001)	15		
EPA National Environmental Performance Track (NEPT)	15		
Other Third-Party Certifications	16		



# INTRODUCTION

**Welcome to Xanterra's third Sustainability Report. We've learned plenty about our environmental performance over the last seven years – where we've done well, as well as where we need to improve. Each time we report, it becomes even more apparent how important it is to regularly assess the entire company's environmental performance. Tracking our performance has proven invaluable in helping us better assess where to: allocate resources and staffing; emphasize regulatory compliance; and target strategic sustainability initiatives.**

Tourism, the largest industry on earth, still lags woefully behind most other industry sectors in reporting and tracking its environmental impacts. It is Xanterra's goal to set the pace in the tourism industry by establishing the standards by which other tourist-related organizations can measure themselves. Xanterra does this through the process of detailed measurement of all aspects of our environmental performance.

This report is not a marketing piece designed to claim how great Xanterra is. It is an attempt, through onerous verification and accountability systems, to prove that environmental performance in the tourism sector is tangible and quantifiable, and therefore able to be benchmarked and then improved upon.

As the largest national and state park concessioner, we believe it is our responsibility to continually push the limits of environmental sustainability in the tourism business. It has been difficult to know for certain whether the hundreds of environmental initiatives we've embarked upon are truly reducing this company's environmental impact on the planet and the parks where we operate. But now, with fully seven years of detailed environmental performance data developed through our Ecometrix tracking system, we believe that our analyses are painting a fairly accurate picture of where we've been and where we are going. We also believe that, while we have thousands of miles to go on the long road toward sustainability, we are headed in the right direction.





## WHO We Are

Xanterra Parks & Resorts' operations span the country — from the subtropical wetlands of the Everglades to the stark desert of Death Valley. The company's legacy of hospitality leadership extends more than a century, back when the Fred Harvey Company began providing quality hotels and restaurants for weary travelers making their way West.

Today, the Fred Harvey Company is known as Xanterra Parks & Resorts, the largest national and state park concessioner in the United States.

Xanterra properties offer a wide range of recreational facilities and experiences. From conference centers with golf courses, tennis courts, and spas, to historic park lodges and cabins, Xanterra facilities are ideal for spending quality time with family; or getting back to nature with hiking, fishing, camping or simply exploring wilderness and natural settings.

The company's 8,200 employees operate 33 hotels and lodges with more than 5,000 guest rooms, 53 retail stores, 66 restaurants, three marinas, five golf courses, and 1,800 campsites within national and state parks. Each year, more than 18 million people visit the national and state parks where Xanterra operates. These include the national parks at Yellowstone, South Rim of the Grand Canyon, Bryce Canyon, Zion, Crater Lake, Death Valley, Rocky Mountain, Petrified Forest, Everglades, and Mount Rushmore National Memorial, as well as facilities at seven Ohio State Parks and two privately-owned resorts, Silverado Resort in Napa, CA, and the Grand Canyon Railway.

### CHANGES AT XANTERRA

New to Xanterra operations in 2007 are Rocky Mountain National Park and the Grand Canyon Railway. The Rocky Mountain facilities include retail and food operations. The Grand Canyon Railway facilities include retail, restaurant and hotel operations, but primarily passenger train operations. Here, visitors take an historic train ride 65 miles from Williams, AZ to the south rim of the Grand Canyon. These two new operations combined add 400 more employees to Xanterra.

In late 2005, Hurricanes Katrina and Wilma effectively wiped out Xanterra's Everglades operations for nearly a year. The facilities there are still only 10 percent of what they were prior to these hurricanes. As of January 1, 2008, Xanterra no longer operates the North Rim of the Grand Canyon. All Ecologix data in this report includes the North Rim; all other statistics do not.

### CORPORATE STRUCTURE

Xanterra Parks & Resorts is a privately held company governed by a President/CEO, along with an Executive Team comprised of Vice Presidents of the company. Xanterra's Vice President of Environmental Affairs is on the Executive Team and reports directly to the CEO on all environmental matters. The Executive Team is updated regularly on environmental issues at monthly meetings as well as through monthly written reports.

Xanterra has had a fully staffed environmental team for nearly six years, with environmental managers and directors hired at all major national park locations. For smaller properties, such as Petrified Forest or Rocky Mountain National Park, oversight has been assigned on a regional basis. The Ohio State Parks' environmental programs are also under regional management.

<b>Xanterra Parks &amp; Resorts</b>			
Employees (seasonal)	8,200	Properties	23
Hotels/Lodges	34	Guest rooms	5,200
Retail stores	53	Restaurants	65
Marinas	3	Golf courses	5
Campsites	1,800	Annual visitors to parks where Xanterra is located	18 million

# TRENDS IN THE PARKS and Tourism Business

## Visitation at National Parks Where Xanterra Operates

Xanterra Operation	2000	2006
Bryce	1,099,275	890,676
Crater Lake	426,883	388,972
Death Valley	1,179,094	744,440
Everglades	995,390	954,022
Grand Canyon	4,460,228	4,279,439
Mt. Rushmore	1,868,876	1,989,771
Petrified Forest	605,192	581,681
Rocky Mountain	3,185,392	2,743,676
Yellowstone	2,838,233	2,870,295
Zion	2,432,348	2,567,350
Total Xanterra Parks	19,090,911	18,010,322
All NPS Parks	285,891,275	272,623,980

The Travel Industry Association placed total U.S. travel expenditures at \$679.4 billion for 2006. Total revenues for the global travel industry are difficult to pin down. However, a reasonable estimate would be \$2 trillion for 2006, making tourism the largest industry on earth.

Dramatic changes in the tourism industry have occurred in the past several years. The major U.S. airlines are recovering from the staggering losses incurred in the early years after the events of 9/11. The price of gasoline, fuel for cruise ships and jet fuel for aircraft remain a major hindrance to the travel industry. Fuel constitutes about 26 percent of operating expenses for airlines today, compared to 10 percent in 2003. Gasoline costs in the U.S. have tripled in only five years. This not only makes it much more expensive to travel by automobile or to drive cross-country in an RV, it also cuts deeply into discretionary spending for leisure and business travel. This may be one reason why visitation has declined roughly five percent in the last six years at national and state parks.





## ENVIRONMENTAL IMPACT OF TOURISM: Not as Green as You May Think

Instead of making carburetors, semiconductors or other mass-produced components, Xanterra manufactures memorable experiences for guests. In the process of creating these memories, the company consumes resources. Xanterra's business operations are relatively non-polluting when compared to many other industries, but, just like any other business, the tourism industry has an impact on the natural environment.

Accommodations, scenic tours, restaurants, conference services, retail outlets and transportation systems use energy of all types, including fossil fuels. Housekeepers and maintenance workers use chemicals to clean facilities. Golf courses and swimming pools consume gallon after gallon of water. And nearly all of these operations generate solid waste, even some hazardous waste.

Additionally, the company's consumption of these resources results in emissions of pollutants into the air, including greenhouse gases (primarily carbon dioxide), nitrogen and sulfur oxides, carbon monoxide and particulate matter.

This report examines not only environmental impacts that Xanterra can manage directly (on-site), but also impacts indirectly (off site). For example, electricity used to power Xanterra operations results in fossil fuel generated emissions at off-site public power plants that can be located many miles away. In fact, more than 70 percent of all emissions mentioned in this report are indirect emissions released off-site at public power plants, not inside a national or state park.





# REPORTING Methodology

Xanterra has applied the Global Reporting Initiative's (GRI) principle of materiality to this report. GRI's definition of materiality says, "information in the report should cover issues and indicators that would substantively influence the decision of the stakeholders using the report." Xanterra expects those users to be: visitors to national and state parks; sustainability professionals; our suppliers, contractors and vendors; all Xanterra employees and the executive management team; the National Park Service (NPS) and Ohio Department of Natural Resources; state and federal regulatory agencies; and tourism industry professionals.

Though we used GRI as a guide for development of this report, we found that, as a medium-sized private company, many of the GRI indicators were not relevant to Xanterra. Other indicators were arguably material, but beyond our ability to measure at the present time. As a result, we followed the GRI principles

and specific indicators to the extent that we were able. For example, as a privately held company, Xanterra does not report any financial data publicly. Instead, Xanterra has focused this report on GRI's environmental performance indicators (presented in the Environmental Performance section of this report) and has included other GRI indicators such as company vision and strategy; organizational profile; report scope; report profile; structure and governance; stakeholder engagement; and overarching policies and management systems.

The format of the Environmental Performance section of this report aims to present multiple years of data for each environmental aspect and area of impact, interpret that data, then give specific examples of projects, programs, and initiatives that affect that data – for better or worse.

## SCOPE OF THIS REPORT

Xanterra's environmental impact is presented using comprehensive data collected from every aspect of its operations across the United States. This report tracks our environmental performance and initiatives based upon seven years of Ecometrix data from calendar years 2000-2006 and also includes details on several new programs that began in 2007. This report also addresses Xanterra's initial endeavors into social performance outlined in the Social Responsibility section.

For more information about Xanterra Parks & Resorts, visit [www.xanterra.com](http://www.xanterra.com). Additional reports can be requested by calling Xanterra's Environmental Affairs department at 303-600-3400.

## VERIFICATION OF THIS REPORT: AUDITING ECOMETRIX AND ENVIRONMENTAL MANAGEMENT SYSTEMS

For Xanterra's last Sustainability Report, environmental performance metrics (Ecometrix) were third-party audited for accuracy by KPMG Performance Registrars, Inc., an international auditing firm. That assessment confirmed that Xanterra's data was, in fact, accurate. However, the auditing process was time consuming and expensive, resulting in the report being developed much later in the calendar year than desired. After analyzing alternative auditing protocols conducted in the reporting world, Xanterra concluded that an internal audit would provide an equally accurate assessment of Ecometrix data in a timely and cost-effective fashion.

**Audit Protocol:** For this 2008 report, Xanterra's internal audit team, lead by Xanterra's internal ISO 14001 auditor, sampled 15 percent of all data points within the Ecometrix system. Data was selected via a random sampling process. Analysis was conducted utilizing utility bills, waste hauling fees, and purchasing receipts. Raw data along with calculations and conversion factors were audited for accuracy.

**Audit Results:** The audit team found 81 percent of data to be 100 percent accurate. The remaining 19 percent were within +/- 1.0 percent of the reported numbers. Based on

It is a well-known environmental mantra that you cannot conserve what you cannot measure. While many companies claim to institute waste-reduction or pollution prevention strategies, few companies diligently evaluate their environmental performance to determine if systems are actually producing effective results.

Xanterra tracks its environmental performance through its computerized Ecometrix tracking system. This system monitors:

- consumption of electricity, natural gas, gasoline, diesel, propane, fuel oil and water
- generation of renewable energy
- generation of solid waste
- recycled materials, waste diverted from landfills, hazardous waste, and recycled hazardous waste
- sustainable cuisine
- greenhouse gas emissions, compliance violations, pollution prevention, and Clean Air Act Criteria Air Pollutant emissions.

Xanterra's hazardous waste tracking also includes Universal Wastes such as batteries, electronics, fluorescent lamps, mercury switches and PCB-containing ballasts.

These indicators represent what we have defined as the company's total environmental footprint. Tracking usage of these key items allows the company to analyze trends, stay compliant, reduce liabilities, and move further toward sustainability.

this analysis, the audit team is confident the information provided within this report is accurate and reliable.

### Other Verification

Measurement, tracking, and verification protocols are critical to real, tangible environmental performance improvement. Therefore, Xanterra has had numerous external parties audit and examine its Ecometrix data and environmental management systems. In 2006, this included an all-day EMS audit conducted by a team of consultants from the Environmental Protection Agency (EPA) (see Environmental Policies and Management section of this report).

Ecometrix data analyses use two methodologies:

### RAW DATA: TOTAL RESOURCE CONSUMPTION\*

From 2000 to 2006, Xanterra collected the data on the annual total amount of resources consumed, waste generated, and associated emissions in operations. This includes energy and fossil fuels, such as coal from electricity consumption at off-site power plants, as well as natural gas, propane, fuel oil, gasoline and diesel fuel used on site in operations. It includes the amount of solid waste generated and recycled, along with waste diversion rates. The company's Ecometrix also includes sustainable food products purchased and sold.

Xanterra then calculates the resulting greenhouse gas emissions (carbon dioxide, CO<sub>2</sub>) and select EPA Clean Air Act-designated criteria air pollutants including sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter at least ten microns in size (PM<sub>10</sub>), volatile organic compounds (VOCs) and carbon monoxide (CO).

### NORMALIZATION: RESOURCE CONSUMPTION PER UNIT OF PRODUCT

Next, Xanterra normalizes the raw data by either annual revenue (total revenue per year) or room nights (total rooms occupied in one year) to develop a metric that best defines overall environmental impact per unit of product (tourist-related goods and services, which include rooms, restaurants, retail, transportation, support facilities). Xanterra recognizes that this performance metric is not a perfect performance indicator, since many factors determine the level of resource consumption. Nevertheless, it has proven to be the most accurate indicator identified.

*\*Minor fluctuations in data from Xanterra's 2005 Sustainability Report are attributed to improved tracking methodologies and updates in industry-accepted emission conversion factors.*

ABS Quality Evaluations, an EMS registrar, conducts Xanterra's external ISO 14001 surveillance and certification audits. During these audits, Ecometrix data and adherence to the ISO 14001 standards are analyzed for progress and accuracy.

Through all of this analysis, our Ecometrix tracking system methodologies and our EMSs have remained consistent and data has proven to be accurate.

# MESSAGE FROM THE President & CEO



In our 2005 Sustainability Report, I stated that one of our biggest environmental setbacks of the year was our inability to finance and install a 220 kW solar energy system in the sunniest place in the country – Death Valley. While we lost that battle, I vowed not to give up on this project because I know that weaning our company off fossil fuels could be the most important environmental achievement we could ever accomplish. With a scientific consensus on human-induced climate change and obvious national security issues surrounding our country’s dependence upon fossil fuels, I’m not sure that there exists a more salient environmental issue for our generation, than global warming.

So, we asked ourselves, “What is the biggest step we could take to reduce our greenhouse gas emissions and dependence on fossil fuels?” We concluded that installing the largest privately-owned zero-emission renewable energy system in the country would be the best solution – for now.

At the time this report goes to print, a one-megawatt solar photovoltaic (PV) energy system is being designed and constructed at our Death Valley operations. This system, the size of seven football fields, will consist of more than 5,700 solar panels. It will generate on site more than 2.2 million kWh per year for the next 30 years – or more. This is enough electricity to power more than 700 American homes a year. It will reduce our greenhouse gas emissions by 1.53 million pounds each year for more than 30 years, totaling 23,000 tons of CO<sub>2</sub>, a more than four percent companywide reduction.

This system is not only one of the largest non-utility PV energy systems in the country; we believe it is also the largest in the entire U.S. tourism industry and among all national park concessioners.

I make this announcement proudly because it has taken months of planning and millions of dollars to make this happen. It is our most prominent example of how much Xanterra cares about the environment and the parks where we operate. It helps us meet our 2015 Environmental Vision goal of reducing fossil fuels and greenhouse gas emissions by 30 percent. In fact, with our greenhouse gas emissions down more than 20 percent since 2000 (normalized), we’re more than half way to meeting a goal that, just a few years ago, we thought would be impossible. This is a testament to what can be achieved once a company, its leadership, its owners, and all of its employees, set their minds to making a change.

Still, this PV system is only one of many new environmental initiatives we’ve undertaken recently. For example, our national park solid waste recycling and diversion rate has made astounding improvements in the last two years thanks to composting successes at Yellowstone. We’ve now exceeded federal Executive Order goals of a 50 percent diversion rate. We power 18 percent of our national park operations with renewable energy. We made significant strides in conserving water in Death Valley, having dedicated over a million dollars to that effort last year. We completed our second LEED-certified





building (rated Silver) at Crater Lake, still one of only a few such LEED-certified buildings in the entire national or state parks business. And this past year we received a special honor, when EPA Administrator, Stephen Johnson, gave Xanterra the Corporate Leader award for demonstrating superior corporate-wide environmental performance. Xanterra is only the fourth company to receive this designation from the EPA.

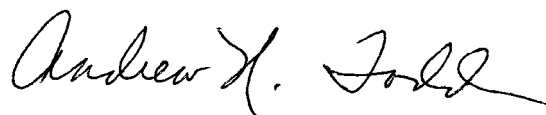
But the news isn't always good, and sometimes we learn more from our failures than our successes. For example, our companywide CAFÉ results actually decreased in the past two years, meaning that our fleet of vehicles is actually less efficient than it once was. I've now asked our environmental affairs department to review all vehicle purchases to prevent further backsliding. We even had a minor oil leak last year. While no resources were damaged and we've aggressively begun remediation, we prefer to focus our efforts on not letting mistakes like this happen in the first place.

In 2007, the company grew significantly with the addition of Rocky Mountain National Park and the Grand Canyon Railway. I am confident that we will advance these operations – which currently have no environmental programs, no environmental management systems, and no energy or waste management initiatives – to our standard of more environmentally sustainable operations.

We know that the effort to operate our business in an environmentally responsible manner requires constant vigilance. So, we continually ask ourselves: Do our environmental initiatives actually reduce our impact on the parks and planet? If so, is it enough? Because we are serious about change, serious enough that we even admit our mistakes, we are willing, even as a private company, to publish this report, show complete transparency, and be held accountable to our guests, our employees, the National Park Service, and the public at large.

We believe that this kind of accountability is the future of the modern environmental movement. We hope to be among its leaders.

As I see it, we really have no choice: businesses must learn to succeed both financially and ecologically. Otherwise, we jeopardize our irreplaceable natural resources, as well as the future generations that depend upon them.



Andrew N. Todd  
President & CEO



# XANTERRA'S LONG TERM Environmental Goals

Knowing that one company's practices can have widespread ramifications, Xanterra Parks & Resorts looks beyond its own properties to examine environmental problems facing the earth as a whole. Xanterra is dedicated to:

- Slowing global warming** working to reduce emissions of pollutants and gases that can cause shifts in climate.
- Preserving natural resources** promoting improved resource efficiency and reduced energy and water use, as well as maximizing recycling.
- Minimizing hazardous substances** moving toward progressive and continuous reduction, leading to eventual phasing out of toxic materials and chemicals.
- Protecting the natural environment** taking measures to safeguard the biodiversity of the world's forests and oceans.

Xanterra's 2015 Environmental Vision goals spawned from a day-long meeting with renowned environmental scientist Hunter Lovins in 2004. Now, that Vision guides all Xanterra employees in the company's quest to become more environmentally responsible—protecting our country's national parks along the way. The company's vision is purposefully far-reaching, but also realistic and achievable. It steers decision-making and helps every employee do their part to protect the environment in which they work. The goals act as a "beacon to sustainability," leading Xanterra in the right direction over the next decade.

Xanterra's 2015 Environmental Vision Goals*	
<b>Fossil Fuels</b>	Decrease fossil fuel usage by 30%
<b>Renewable Energy</b>	Increase usage of renewable energy to provide 7% of total electricity consumed.
<b>Emissions</b>	Decrease greenhouse gas (CO2) emissions by 30%
<b>Solid Waste</b>	Divert from landfill 50% of all solid waste generated
<b>Sustainable Cuisine</b>	Increase purchases of sustainable food items to 50% of all company-wide food expenditures.
<b>Transportation</b>	Achieve company-wide CAFÉ (corporate average fuel economy) standard of 35 miles per gallon (EPA rated combined city and highway) for all passenger vehicles (under 10 persons) purchased annually
<b>Hazardous Waste</b>	Generate zero hazardous waste
<b>Water</b>	Decrease water usage by 25% (baseline year 2003)

\* All goals use a baseline year of 2000 except where specifically noted otherwise



# SUMMARY OF Environmental Performance

The company's overall environmental performance is best assessed by looking at annual trends and progress toward meeting the 2015 goals. Individual Xanterra operations set property-specific, annual environmental goals that are tied to the company-wide 2015 goals. A facility's specific objectives

and targets are measured for performance against annual goals that are congruent with the 2015 goals. While this data is explained and analyzed in detail in later sections, here are a few highlights from the last seven years (2000-2006):

## PROGRESS TOWARD XANTERRA'S 2015 ENVIRONMENTAL VISION GOALS

Resource	Xanterra's 2015 Goal	2006 Progress Toward Goal (baseline year 2000*)
Greenhouse Gas Emissions	Decrease greenhouse gas (CO <sub>2</sub> ) emissions by 30%	Greenhouse gas (carbon dioxide) -17.0% (-20.2% normalized)** Sulfur and nitrogen oxide -20.5% Nitrogen oxide -20.7%
Renewable Energy	Increase usage of renewable energy to provide 7% of total electricity consumed	Renewable energy provides 18.2% of all electricity usage (excluding hydroelectric) in Xanterra's national park operations. Companywide, this represents 11.5% of all electricity used. From 2006-2007 renewable energy increased 28%. (These figures include new on-site solar PV systems being developed in 2007 in Death Valley and Rocky Mountain National Parks).
Solid Waste	Divert from landfill 50% of all solid waste generated	Diversion rate 51% (national parks); 38% (companywide) Waste to landfill -31.1% (from 13.4 million to 9.3 million pounds) Waste recycled/diverted +209% (from 1.87 million pounds to 5.78 million pounds)
Fossil Fuels	Decrease fossil fuel usage by 30%	Electricity usage -14.2%** (-17.5% normalized for revenue) Propane usage +23.7% (+19% normalized) Natural gas usage -4.9% (-8.5% normalized) Heating fuel oil usage -26.5% (-29.3% normalized) Diesel fuel usage +7.4% (+3.3% normalized) Gasoline usage +20.5% (+15.9% normalized)
Sustainable Cuisine	Increase purchases of sustainable food items to 50% of all company-wide food expenditures	Sustainable cuisine purchases have increased from \$1.4 million in 2004 to \$3.1 million in 2006, a 120% increase in two years, totaling 11.4% of companywide food expenditures.
Transportation	Achieve company-wide CAFÉ (corporate average fuel economy) standard of 35 miles per gallon for all passenger vehicles purchased annually	Xanterra's 2007 corporate average fuel economy (CAFÉ) was 20.4 mpg (EPA rated combined city/highway), an 8.1% increase from 2002 (since data was first tracked).
Hazardous Waste	Generate zero hazardous waste	Hazardous waste recycled has increased every year, more than 294% since 2000. Hazardous waste generated and disposed has fluctuated with a small downward trend. All operations except three are CESQG or generate zero regulated hazardous waste.
Water	Decrease water usage by 25% (baseline year 2003)	Total companywide data is currently not accurate enough to report. Property-specific data is reported in the Water section of this report.

\* All goals use a baseline year of 2000 except where specifically noted otherwise

\*\* Electricity usage includes total kilowatt hours used company-wide, regardless of the source of that electricity

\*\*\*These figures account for on-site renewable energy generation as well as renewable energy purchases

*Much of Xanterra's resource usage continues to trend favorably. Xanterra considers one of its most significant achievements to be its 17 percent gross decrease in greenhouse gas emissions (20.2 percent normalized for revenue), not only because of the importance of climate change, but also because greenhouse gases indicate fossil fuel usage and its associated impacts upon natural systems and national security.*



## PROGRESS TOWARD MEETING PRESIDENT BUSH'S NEW EXECUTIVE ORDER

In 2006, President Bush signed a new Executive Order (E.O.) named Strengthening Federal Environmental, Energy, and Transportation Management. The new E.O. requires Federal agencies and its contractors to advance the nation's energy security and environmental performance by achieving specific goals (outlined below). The E.O. consolidates and strengthens five previous E.O.'s and two memorandums of understanding and establishes new goals, practices, and reporting requirements for environmental, energy, and transportation performance. Xanterra, as a contractor to the federal government, not only will meet, but also exceed, these goals. Below is a summary of Xanterra's progress toward these new goals.

Resource	2006 Federal E.O. Goal	Xanterra's Progress Toward Executive Order Goals
Fossil Fuels	Reduce petroleum consumption in fleet vehicles by 2% annually through 2015. Reduce energy intensity 30% by 2015	Although total fleet vehicle petroleum consumption has increased over the last seven years by 20%, due to an increase in the number of vehicles, annual fleet average fuel economy has increased more than 8% in seven years. Electricity intensity (normalized for revenue) is down 17.5%
Renewable Energy	At least 50% of current renewable energy purchases must come from new renewable sources (in service after January 1, 1999)	100% of Xanterra renewable energy purchases come from new sources.
Emissions	Reduce greenhouse gas emissions through reduction of energy intensity by 3% annually or 30% by 2105	Xanterra's greenhouse gas emissions intensity (normalized for revenue) is down 20.2% in seven years
Solid Waste	Divert from landfill 50% of all solid waste generated	51% of solid waste generated is diverted or recycled from a landfill at Xanterra national park operations
Procurement	Expand purchases of environmentally-sound goods and services, including biobased products	Sustainable cuisine purchases have increased 120% in the last two years. Environmentally preferable purchases continue throughout the company
Transportation	Increase purchase of alternative fuel vehicles when commercially available. Increase alternative fuel consumption 10% annually	Xanterra has undertaken numerous steps to reduce the environmental impact associated with transportation (see Transportation section of this report for details).
Building Performance	Construct or renovate buildings in accordance with sustainability strategies	The last two buildings Xanterra fully constructed are both US Green Building Council LEED certified. Many Xanterra renovations use the LEED Existing Building rating system as a guideline during design.
Water	Reduce water consumption intensity by 2% annually through 2015	Data not available
Pollution Prevention	Reduce use of chemicals and toxic materials and purchase lower risk chemicals and toxic materials from top priority list	Xanterra has switched to Green Seal certified nontoxic cleaners and is phasing out ethylene glycol with propylene glycol at most operations
Electronics Management	Electronic products purchased must meet Electronic Product Environmental Assessment Tool standards; enable Energy Star® features on 100% of equipment; and reuse, donate, sell, or recycle 100% of electronic products	All new Xanterra computers are Energy Star rated. All old computers are recycled or donated.
Environmental Management Systems	By 2010, increase to at least 2,500 the number of Federal operations that implement environmental management systems	All Xanterra federal national park operations have functioning environmental management systems certified to the ISO 14001 standard.*

\* Xanterra's Everglades ISO 14001 certification of EMS was temporarily suspended due to closing of the operation from Hurricanes Wilma and Katrina in 2005-6. The EMS and its ISO 14001 certification will be reengaged in late 2007.

# ENVIRONMENTAL Program Highlights

Xanterra strives to be on the cutting-edge in environmental performance. The following are a few examples of ways that Xanterra is trying to lead the tourism industry toward being more sustainable.

- Installing one of the largest non-utility renewable energy systems in the U.S. – a one-megawatt solar photovoltaic system in Death Valley National Park (enough energy to power 500 homes a year).\*
- 2006 recipient, out of many National Environmental Performance Track partners, of the Corporate Leader award from the Environmental Protection Agency (EPA).
- The first concessioner to develop sustainable “Green Suites” (ecologically sound hotel rooms) for guests.
- One of only a few hospitality companies to recycle grease on-site into biodiesel for use in fleet vehicles.
- The first and only national park hospitality company to receive U.S. Green Building Council’s Leadership in Energy & Environmental Design (LEED) certification at two locations. This includes a LEED Silver rating at Crater Lake National Park for the Annie Creek restaurant and retail building and LEED certification at a Yellowstone National Park employee housing facility.
- Pioneered the development (along with several partners including the NPS) of a mobile propane bottle recycling unit that recycles camper propane bottles, collecting and using the waste fuel to power the unit.
- The first U.S. hospitality company to commit to an absolute reduction target in greenhouse gas emissions (through a partnership with the World Wildlife Fund) and the only hospitality company to actually achieve that goal.
- One of only a few hospitality companies to use on-site renewable solar photovoltaic systems (At Xanterra, these power portions of electricity demands at five national parks).
- The first park hospitality company to develop an internal CAFE standard for fleet vehicles.
- The first U.S. hospitality company to ban sales of certain types of fish species deemed harmful to the environment because of harvesting practices or low species populations.
- One of a few hospitality companies using renewable, clean-burning biodiesel in boilers and vehicles.
- Achieved the designation of “Certified Audubon Cooperative Sanctuary” from the Audubon Cooperative Sanctuary System (ACSS) for the Furnace Creek Golf Course in Death Valley National Park.
- The first national park hospitality company to publish a periodic sustainability report publicly disclosing environmental performance.
- Among the first U.S. hospitality companies to receive the prestigious ISO 14001 International Environmental Management System certification for all of its national park operations.
- The first park hospitality company to publish and implement its own Guidelines for Environmentally Sustainable Design and Construction for buildings in national parks.
- The first U.S. hospitality company to be granted “Chain of Custody” certification from the Marine Stewardship Council (MSC) to ensure sales of sustainably fished wild salmon.
- One of only a few hospitality companies to use renewable wind energy to power a portion of electricity demands (at seven national park locations).
- The first, and possibly the only, U.S. hospitality company to track and normalize all natural resource usage and waste generation at all locations through a computerized Ecometrix tracking system.
- The first park hospitality company to set and publicly disclose long-range environmental sustainability goals.
- One of the few national park concessioners in the country to achieve Clean Marina Certification (at three locations).

\* By the time this report went to print the one-megawatt solar PV system in Death Valley was designed and engineered, site and permit issues were addressed, and construction had neared commencement. Construction will be completed in February of 2008.

# ENVIRONMENTAL POLICIES & Management

## XANTERRA'S Environmental Policy

Ecologix is Xanterra's company-wide, intranet-based Environmental Management System (EMS). Through the framework of Ecologix, which represents a "logical integration of ecology and business," Xanterra has institutionalized programs that protect the fragile ecosystems that surround the company's hotels, shops, restaurants, and support facilities.

**ecologix** ensures:

- a framework for continual improvement and review of environmental performance at all Xanterra national park operations
- compliance with all applicable environmental regulations and policies, and with other environmental requirements to which Xanterra subscribes
- incorporation of best management practices into our operations — using pollution prevention and environmental sustainability strategies as core objectives

### ecologix MISSION

*"Our business decisions balance economic viability with ecological responsibility.*

*We reduce and recycle waste, conserve energy and water, and educate our guests and employees on environmental stewardship.*

*We believe that increasing the sustainability of natural systems is not just good business. It is the right thing to do."*





# VERIFICATION OF Environmental Management Systems (EMS)

Marketing hyperbole and good public relations can create a perception that a company is not degrading the environment, when quite the opposite may be true. So, Xanterra has aggressively pursued external, third-party verification and certification of specific environmental programs to determine if, in fact, the company's environmental initiatives are truly reducing impacts.

In order to determine whether environmental programs are effective, Xanterra began certifying its Ecologix EMSs through two external organizations:

- 1) the International Organization of Standardization (ISO); and
- 2) the Environmental Protection Agency (EPA) National Environmental Performance Track.

## 1) Meeting the ISO 14001 Certification EMS Standard



All Xanterra national park operations' EMSs are certified to the ISO 14001 standard, or are in the process of being certified (as is the case with our new operations). In 2005, due to damage from hurricanes Wilma and Katrina, Xanterra temporarily suspended its ISO 14001 certification at the Everglades. Currently, Xanterra is in the process of recertifying its EMS there. Newly acquired Grand Canyon Railway and Rocky Mountain National Park operations are also in the process of EMS development and implementation, and are scheduled for ISO 14001 certification in 2008.

Each Xanterra operation's EMS supports environmental protection and pollution prevention in a management framework that commits the company to continual environmental improvement. Additionally, the EMS strives to meet National Park Service (NPS) goals and federal Executive Orders. It accurately defines all the environmental aspects – each area of business operations that interacts with the environment at each specific national park location.

Xanterra is still one of only a small handful of companies in the tourism industry with ISO 14001 certification of its EMSs, further increasing our environmental accountability. Additionally, our Ecologix EMS integrates the ISO 14001 certifications with a computerized intranet-based tracking and reporting system (Ecometrix), an intranet-based Corrective and Preventative Actions Database (CPAD), numerous internal audits, our 2015 Environmental Vision goals, and a sustainability report to provide a comprehensive picture of environmental performance.

## 2) EPA National Environmental Performance Track (NEPT)



While ISO 14001 requirements provide the structure and system for effective environmental management, every park operation has its own environmental priorities. Auditing an operation solely on the ISO standard is not enough to adequately ensure environmental protection and performance. Under ISO, it would be possible in theory for a company to set relatively easy, attainable goals without producing meaningful environmental improvements and still receive a satisfactory audit.

That is why Xanterra voluntarily asked the EPA to scrutinize its environmental performance. The EPA has now accepted nine Xanterra national park operations into its National Environmental Performance Track (NEPT) program.

This program requires that Xanterra must implement high-quality environmental management systems and set rigorous environmental goals while obtaining measurable results. Environmental goals, results, and EMS strategies are reviewed and audited annually.

### CORPORATE LEADER AWARD

Currently, an elite group of (primarily Fortune 500) companies pursuing environmental sustainability has been allowed into this program. Of these leading companies, a few are selected each year as the "Performance Track Corporate Leader," designating that company as the leader in demonstrating exceptional corporate-wide commitment to environmental stewardship, continuous improvement, and superior environmental performance.

In 2006, Xanterra was selected by EPA Administrator, Stephen Johnson, for that designation. Xanterra is the fourth company to receive this designation. Previous designees include global medical products company Baxter Healthcare Corp.; manufacturer of health care products, Johnson & Johnson; and global provider of aviation electronic and communication solutions Rockwell Collins.

## OTHER THIRD-PARTY CERTIFICATIONS: Verification of Compliance and Sustainability

- **US Green Building Council LEED Silver Certification**, Annie Creek Restaurant and Retail Store, Crater Lake National Park
- **US Green Building Council Leadership in Energy and Environmental Design (LEED) Certification**, Yellowstone employee housing
- **Audubon Cooperative Sanctuary System (ACSS)**, Certified Audubon Cooperative Sanctuary, Furnace Creek Golf Course, Death Valley National Park
- **Marine Stewardship Council Certification**, “Chain of Custody” certification for serving sustainable seafood
- **Clean Marina Certification**, Everglades National Park Marina, Florida Department of Environmental Quality
- **Climate Cool Certified** renewable certificate at Mount Rushmore
- **Clean Marina Certification**, Maumee Bay State Park Marina, Ohio Department of Natural Resources
- **Clean Marina Certification**, Geneva Marina Park, Ohio Department of Natural Resources
- **Environmental Protection Agency**, National Environmental Performance Track, Xanterra Parks & Resorts at Zion National Park; Bryce Canyon National Park; Mount Rushmore National Memorial; Grand Canyon South Rim; Crater Lake National Park; and Death Valley National Park
- **EPA Energy Star Partner**, Xanterra Parks & Resorts
- **Certified organic and fair trade** coffee in restaurants
- **Green-e Certified renewable energy credits** at Zion, Crater Lake, Grand Canyon South Rim, and Yellowstone



Ongoing external certifications are paired with numerous internal environmental audits:

- Each national park operation receives annual both internal and third-party ISO 14001 audits annually
- All eleven of Xanterra’s national park operations have undergone NPS concession environmental audits
- The EPA annually audits all Xanterra EMS goals
- In 2006, the EPA and a team of consultants audited Xanterra’s corporate office environmental system, policies, and procedures
- In 2004, Xanterra commissioned a private company to perform environmental compliance audits at five locations
- Xanterra is audited annually by Surefish, Inc. to ensure that certain fish used in restaurant dishes are certified for sustainability



# ENVIRONMENTAL Performance

## GREENHOUSE GAS and Criteria Air Pollutant Emissions

We can recycle all the plastic bottles and aluminum cans in the world, but make no mistake that the challenge of our generation is not overflowing landfills; it's climate change. Xanterra believes that reducing its greenhouse gas emissions is one of the most environmentally significant things it can do to protect national parks and the planet.

There are countless ways to reduce greenhouse gas emissions. Clearly, the most significant source of emissions for Xanterra is from fossil-fuel-derived energy used in lighting and heating buildings, transporting guests and providing hot water, hot meals, and clean linens to those guests. All of that requires energy, and most of that energy is derived from fossil fuels, either on site by burning fuel oil, gasoline, and propane, or off site at coal-fired power plants that provide electricity.



### Climate Change Primer

Global climate change does occur naturally; the ice age is an example. The Earth's natural climate has always been, and still is, constantly changing. However, what the climate scientists are seeing today differs from previous climate change in both its rate and its magnitude. The temperature on Earth is regulated by a system known as the "greenhouse effect" where greenhouse gases – water vapor, carbon dioxide, methane, and nitrous oxide – trap the heat of the sun, preventing radiation from dissipating into space. Without the effect of these naturally occurring gases, the average temperature on the Earth would be -0.4° F, instead of the current average of 59°F. Life as we know it would be impossible.

Over the past 200 years, emissions of these gases due to human activities have accumulated in the atmosphere, where, because of their long life, they stay for centuries. As a result, since the Industrial Revolution, concentrations of carbon dioxide have increased by 30 percent, methane by 145 percent, and nitrous oxide by 15 percent. The cause of these increases has been human activities related to our increasingly sophisticated and mechanized lifestyle, in particular, the burning of fossil fuels such as coal, oil, and natural gas to generate electricity and to power factories and cars. In addition, humans have cleared more land for human use in the past 100 years than in all of prior human history. This has resulted in the loss of forests and wetlands, which absorb and store greenhouse gases and naturally regulate the atmosphere.

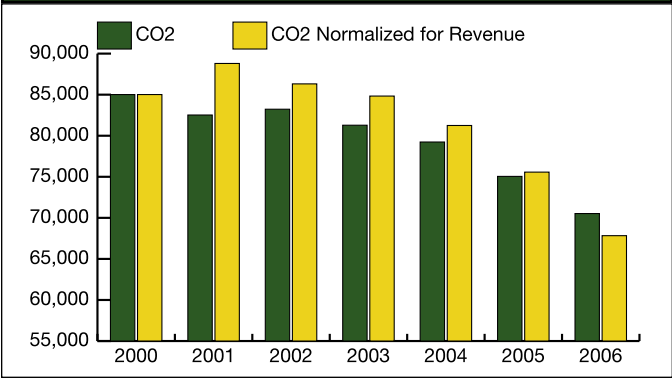
In effect, by increasing the amount of these heat-trapping gases, we have "enhanced" the natural greenhouse effect to the point that it has the potential to warm the planet at a rate that has never been experienced in human history. Already, the average global temperature has increased by about 1.0° F in the past 100 years, and temperature increases over the next 100 years are expected to significantly surpass any such change of the past 10,000 years.

Raising the global temperature may trigger a series of changes within the overall global climate system. For instance, global sea levels have already risen 4-9 inches over the past 100 years, and are expected to continue to rise due to increases in temperature. We are also seeing increases in severe weather events. National Park ecosystems have already been affected. The glaciers of Glacier National Park are almost gone and will be gone in less than 30 years. Such impacts of climate change could have far-reaching and unpredictable environmental, social, and economic consequences.

Xanterra believes that the climate change problem and its feared effects are among the most serious of the environmental issues that we face today.



### ecometriz: Total Greenhouse Gas Emissions and Emission Normalized for Revenue (Tons CO2)



Total companywide greenhouse gas emissions declined significantly over the last seven years while visitation has remained somewhat flat. Total CO2 emissions have been reduced 17.0 percent (20.2 percent normalized for revenue) over that period.

This reduction, possibly the company's most significant environmental achievement, can be attributed to a combination of on-site renewable energy generation systems (solar PV primarily), wind power purchases, fuel switching (from heating fuel oil to propane), extensive lighting retrofits, and strategic conservation programs, especially targeted area shutdowns, more energy control systems in rooms and facilities, and efficiency upgrades such as Energy Star-rated equipment.

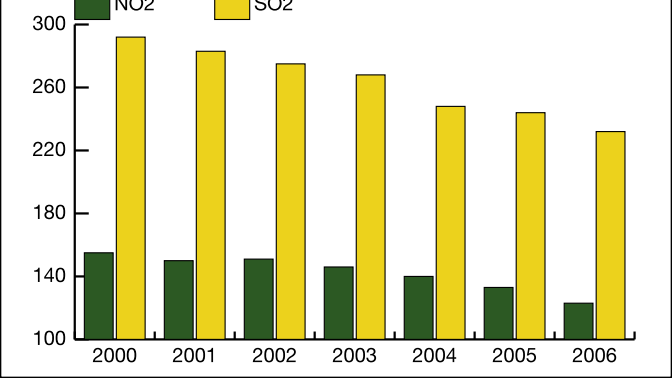
The company has now exceeded its ten-year World Wildlife Fund greenhouse gas emission-reduction goal of 10 percent, and it is well on its way to reaching its 2015 Environmental Vision goal of a 30 percent reduction.

Sources: Greenhouse gas emissions conversion data and EPA Criteria Air Pollutant emissions data were calculated using several sources including: the Leonardo Academy, "Emission Factors and Energy Prices for Cleaner and Greener Program," the World Resources Institute, the World Business Council on Sustainable Development's Greenhouse Gas Protocol, and the Department of Energy's Energy Information Administration's "Voluntary Reporting of Greenhouse Gases" program.

When Xanterra calculates its emissions, it includes all pollution produced by its operations – from vehicles, boilers and even kitchen ovens – as well as emissions triggered back at the regional public power plant from electricity usage.

Xanterra's potential to emit Criteria Air Pollutants falls well below regulatory thresholds, which means it is not subject to regulation under the 1990 Clean Air Act Amendments. Still, Xanterra aggressively combats pollution emitted by vehicles, buildings and regional public power plants to help keep the vistas at national and state parks clear.

### ecometriz: Total Annual Select Criteria Air Pollutant Emissions (Tons)



All EPA Criteria Air Pollutants, voluntarily tracked by Xanterra, decreased significantly as Xanterra switched to cleaner burning fuels. Sulfur and nitrogen oxide emissions decreased 20.5 and 20.7 percent, respectively, since 2000.

In the past two years, Xanterra has taken its commitment to reduce air emissions in national parks to an even higher level, as exemplified by the initiatives on the following pages. (See this and following Energy, Renewable Energy, and Transportation sections of this report for details).



# CLIMATE CHANGE ACTION PLAN

In 2007, Xanterra's focus on reducing greenhouse gas emissions evolved into a larger companywide Climate Change Action Plan (CCAP). Currently, the CCAP consists of an aggregation of all the climate reducing strategies and measures Xanterra has undertaken to date and a detailed assessment of meeting both short and long-term greenhouse gas emission reduction goals. This plan ties together all of the company's efforts into one cohesive approach. A few of the most recent measures taken that are tied to the plan are outlined below.

## Select Summary of CCAP Emission Reduction Measures

- One of the largest non-utility renewable energy systems in the country, a 1 MW solar photovoltaic (PV) energy system, is being constructed at our Death Valley operations (see Renewable Energy section for details).
- Four other on-site renewable solar photovoltaic energy systems have been or are in the process of being installed at various national parks.
- Wind power energy is purchased at seven Xanterra facilities (see Renewable Energy section for details).
- Cleaner burning biodiesel (produced from soybeans) is used in boilers at three locations. Biodiesel is biodegradable, nontoxic, virtually free of sulfur and particulate emissions when burned, and produces fewer greenhouse gasses.
- On-site kitchen grease conversion to biodiesel is occurring at two Xanterra locations.

- Since 2000, Xanterra has switched from "dirty" two-stroke engine technologies in its boats and snowmobiles to all new four-stroke engines, reducing noise and emissions and increasing efficiency by 65 percent.



- Alternative fuels like E10, a blend of 10 percent ethanol, are used to power snowmobiles and snowcoaches.
- All in-park tour buses at the South Rim have hydrous alcohol injectors that decrease visible emissions by 66.4 percent and increase fuel economy by 19.7 percent.
- Xanterra continues to retrofit and replace fuel oil-powered boilers with cleaner burning alternative fuels, even reducing fuel oil usage at the Grand Canyon to zero by conducting 14 fuel oil-to-propane retrofits
- Zion fuel-oil-fired boilers were replaced with an on-demand propane-fired boiler and appliances.
- Xanterra partners with the World Wildlife Fund (WWF) and the Center for Energy and Climate Solutions to cut the company's heat-trapping carbon dioxide emissions as part of WWF's Climate Savers initiative. Under this agreement, Xanterra becomes the first hospitality company to commit to an absolute CO2 reduction target and the ninth business to join WWF's Climate Savers initiative.
- Xanterra participates in NPS Climate Friendly Parks Programs to help inventory, track, and reduce greenhouse gas emissions in national parks. Xanterra has given presentations and participated in four Climate Friendly Parks workshops held at Zion, Everglades, Rocky Mountain, and Glacier National Parks.



- Sustainably designed "Green Suites" at Zion Lodge reduce energy usage and emissions through innovative technologies (see Sustainable Design section of this report).
- More than 50,000 lighting retrofits have occurred throughout all Xanterra operations.

# FOSSIL FUEL Energy

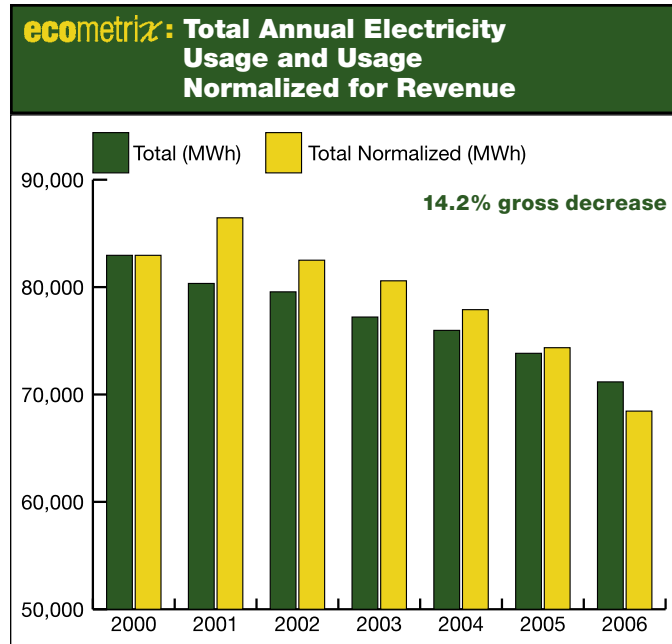
Using energy efficiently reduces emissions, enhances guest service, saves money, and even helps Xanterra do its part to protect national security, by helping the country slowly wean itself off of foreign sources of fossil fuels. Since 2000, Xanterra has aggressively pursued energy efficiency and conservation through numerous initiatives.

<b>ecometriz : Total Energy Usage</b>								
	2000	2001	2002	2003	2004	2005	2006	% Change 2000-2006
Electricity (kWh)	82,960,145	80,341,957	79,558,230	77,213,937	75,971,281	73,835,589	71,173,377	<b>-14.2</b>
Propane (Gal)	1,371,214	1,539,505	1,674,115	1,715,664	1,813,659	1,783,869	1,696,967	<b>23.8</b>
Natural Gas (Th)	863,199	854,889	932,461	909,797	919,300	873,855	820,852	<b>-4.9</b>
Fuel Oil (Gal)	806,947	704,350	663,742	681,668	609,804	568,790	592,788	<b>-26.5</b>
Gasoline (Gal)	300,180	290,919	299,626	323,156	309,074	360,590	361,823	<b>20.5</b>
Diesel (Gal)	117,729	109,184	111,022	91,572	107,343	100,107	126,517	<b>20.54</b>

<b>ecometriz : Total Energy Usage Normalized for Revenue</b>								
	2000	2001	2002	2003	2004	2005	2006	% Change 2000-2006
Electricity (kWh)	82,960,145	86,453,259	82,506,880	80,586,617	77,900,602	74,347,524	68,453,909	<b>-17.4</b>
Propane (Gal)	1,371,214	1,656,609	1,736,162	1,790,604	1,859,717	1,796,238	1,632,127	<b>19.0</b>
Natural Gas (Th)	863,199	919,917	967,021	949,537	942,646	879,914	789,488	<b>-8.5</b>
Fuel Oil (Gal)	806,947	757,927	688,342	711,443	625,290	572,734	570,138	<b>-29.3</b>
Gasoline (Gal)	300,180	313,049	310,731	337,272	316,923	363,090	347,998	<b>15.9</b>
Diesel (Gal)	117,729	117,490	115,137	95,572	110,069	100,801	121,683	<b>3.4</b>



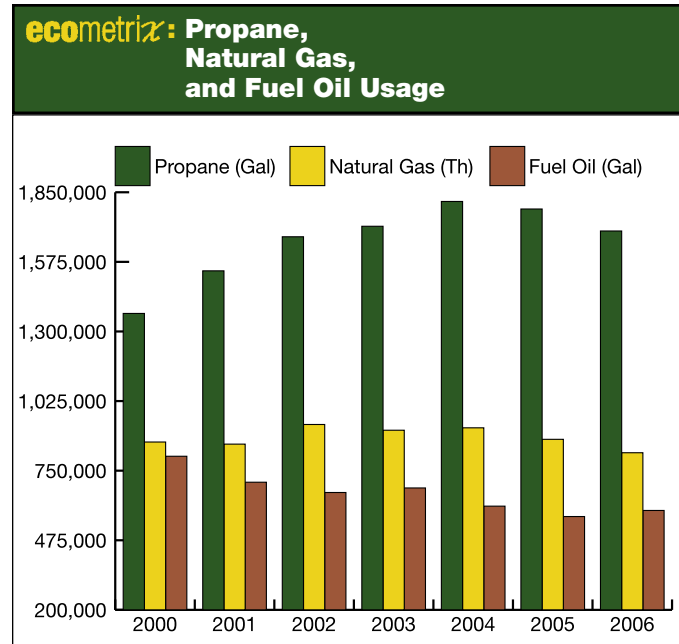




One of the company's most significant resource reduction successes is the 14.2 percent reduction in total electricity consumption (17.5 percent normalized for revenue), due largely to the numerous conservation and efficiency programs implemented over this seven-year period. A small portion of that savings is due to a decrease in energy usage at Everglades (caused by hurricane damage).

Increases in cleaner burning propane and natural gas are attributed largely to technology retrofits that eliminated "dirty" fuel oil boilers for building heating, hot water and steam generation.

The company's "dirtiest" fossil fuel, fuel oil – which emits more sulfur and nitrogen oxides, as well as higher amounts of particulates – continues to decrease in usage, down 26.5 percent. The same trend



is reflected in statistics normalized for revenue (down 29.3 percent), showing that this "dirty" fuel is in fact being phased out of Xanterra operations through reduced consumption, fuel switching, and increased use of biodiesel.

While natural gas and fuel oil usage continue to decrease, diesel fuel and gasoline have increased. This increase is despite the company's efforts to increase fuel efficiency standards. We have not identified a concrete reason as to why this has occurred other than the fact that the company continues to purchase yet more vehicles each year, increasing fleet size while still using older vehicles as long as possible. Fortunately, transportation fuels represent relatively minor portions of Xanterra's total energy usage.

**Throughout 2005 and 2006, Xanterra continued to launch numerous energy efficiency programs. They are highlighted in the sections that follow.**

***"Interestingly, the oil companies know very well that in less than 30 years they will not only be charging very high prices, but also that they will be uncompetitive with renewables."***

**Paul Hawken**

# ENERGY EFFICIENCY AND GHG REDUCTION PROJECTS

## FINALLY, CONTROL TECHNOLOGIES THAT WORK

In 2006, Maumee Bay State Park began using a state-of-the-art computerized energy management system called Automated Logic. Through this system, chief engineer, Jamie Mazarrri, remotely monitors cabins for energy usage, detects if there is a malfunction in any mechanical equipment, sets temperatures prior to guest arrival, and prevents pipes from freezing in winter, all with the touch of his finger from a computer at his desk. This saves money while improving guest experience.

At many other Xanterra locations, energy management controls, occupancy sensors, programmable thermostats and Energy Misers™ are reducing energy usage by up to 30 percent in targeted areas. At the South Rim of the Grand Canyon, for example, Xanterra installed 325 occupancy-sensing, digitally-programmable thermostats. At Hueston Woods Resort and Conference Center in Ohio, Xanterra installed Smart Stats controls to better manage heating and cooling in guest cottages. At other Ohio locations and at Yellowstone, Energy Miser controls shut down vending machines when not in use, saving up to 25 percent in refrigeration costs per machine.

## SAVING ENERGY ONE LAMP AT A TIME

One small light bulb can make a tremendous difference, especially if each of the more than 50,000 of them installed in your operations uses 70 percent less electricity than a standard bulb. Retrofitting old incandescent bulbs with super-efficient compact fluorescent lamps (CFLs) continues to be one of Xanterra's biggest energy-saving initiatives. Additionally, the lamps generate 50 percent less heat than standard lamps, reducing air conditioning loads.

These retrofits alone save approximately 4,420,000 kWh per year, not to mention approximately \$400,000 in labor, lamp replacement, and energy costs. This keeps 3,900 tons of CO<sub>2</sub>, 12 tons of sulfur dioxide and six tons of nitrogen oxide out of the air annually.

## CORPORATE GREENIES GET LIGHT RAIL SUBSIDY

Employees at the corporate office in Denver are reducing their greenhouse gas emissions by using light rail thanks to a full subsidy by the company. The Eco Pass allows all corporate office employees to use light rail, the bus system, and emergency taxis at any location in the Denver metro area, helping Xanterra employees reduce smog and ozone pollution.

## REDUCING EMISSIONS FROM KITCHEN EQUIPMENT WITH VARIABLE SPEED HOOD CONTROLS

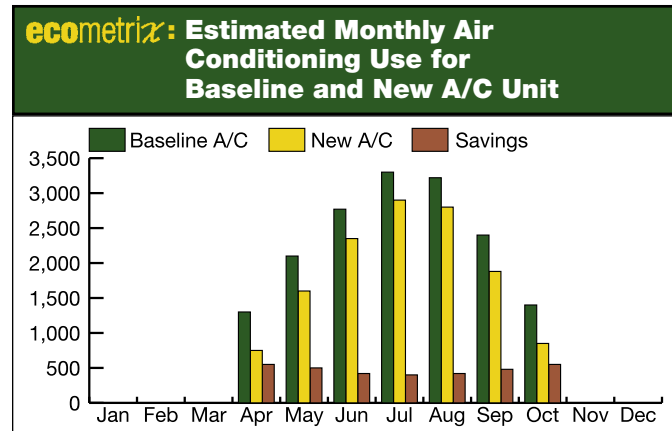
Literally every kitchen in this country has large hood fans that exhaust grill smoke out of the building. Those fans operate up to 18 hours a day, 365 days a year, consuming inordinate amounts of energy, pumping conditioned air outside the building, unnecessarily wasting natural resources and emitting greenhouse gases. To address this, Xanterra at Mount Rushmore has implemented the latest in kitchen technologies, a variable speed hood control system. This new hood control system senses heat and particulate matter (smoke), automatically modulating the fan motors up or down depending upon usage. If a grill is shut down during a slow period, the hood reacts accordingly and lowers its speed. The resulting energy savings have been astounding. Data analysis has shown the hoods save approximately \$19,000 per year, enough to pay for themselves in just over one year. This includes savings from electricity that runs the motors as well as heating and cooling savings by not sending conditioned air outside. Greenhouse gas emissions savings are estimated at 180 tons per year from this unit alone.



**QUESTION: Where Would You Test the Newest Most Efficient Air Conditioner on the Market?**

**ANSWER: The hottest place in the Country—Death Valley**

Death Valley has always been a proving ground for new technologies, even environmental technologies, because when a product survives the 120 °F heat, high winds, and dust storms found only in Death Valley, you know it will work any place! Through a partnership with Southern California Edison, Xanterra tested a five-ton SEER 15 (seasonal energy efficiency ratio) roof-mounted air conditioner. This unit has the highest efficiency rating of any unit on the market. The unit passed the test and now Xanterra is using that unit to cool its offices, saving around 500 kWh of electricity per summer month and reducing greenhouse gas pollution by 2,300 pounds per year.



**OHIO PARK OPERATIONS SEE THE LIGHT ON GREENHOUSE GAS EMISSIONS**

Xanterra's Ohio State Park operations continue to make significant strides in reducing greenhouse gas emissions by using energy more efficiently.

In late 2006, a comprehensive lighting retrofit was conducted at all Ohio state parks, replacing more than 11,500 energy-wasting, heat generating incandescent lamps with super-efficient, cooler, compact fluorescent lamps. These lamps are saving more than \$84,000 per year in energy, labor, and lamp replacement costs. Greenhouse gas emission reductions for this retrofit alone total 700 tons of CO<sub>2</sub> per year.

Other measures implemented at various Ohio locations over the last two years include:

- Boiler retrofits at three locations
- Conversion of T-12 to T8 fluorescent lamps at several locations
- Automated Logic® building automation systems at Maumee Bay and Salt Fork
- Vending Misers® and lighting occupancy sensors in many places
- Solar films on large glass areas in dining room and lobby windows
- Motion-detector thermostats on HVAC systems in cabins at Hueston Woods
- Ice makers and aging, inefficient equipment replaced at Salt Fork
- Kitchen energy conservation awareness program rolled out to Ohio chefs
- Testing of a new "liquid pool cover" to help minimize evaporation at some parks; pool water temperatures lowered to 82 degrees
- Weather stripping on all doors and improved equipment maintenance on all mechanical systems
- Old inefficient central boiler and central chiller replaced with 12.8 SEER Amana DigiSmarteat Heat Pump PTAC units





## “Deep Green” Case Study: ZION LODGE

In the last few years, Xanterra’s Zion Lodge has implemented aggressive energy and natural resource efficiency programs that now make it one of the most resource efficient and “green” facilities in the national park system.

Fully 85 percent of the electricity used at Zion Lodge is procured from renewable wind power, exceeding 1,427,000 kWh per year of Green-e-certified renewable energy. A 15,000 Watt photovoltaic solar array, which generates 30,000 kWh per year, was installed on site. Ninety percent of all lighting has been retrofitted with energy-efficient compact fluorescent lamps, which save 70 percent in electricity relative to incandescent lamps. All computer and equipment purchases are EPA Energy Star approved. The company removed a polluting diesel-fired boiler and replaced it with energy efficient “on-demand” propane equipment, reducing emissions, saving 24,000 gallons of fuel, and preventing the potential for a fuel spill.

Transportation was addressed by acquiring several electric vehicles, retrofitting two others to propane (eliminating gas-guzzling trucks for routine maintenance calls), purchasing one hybrid electric Prius and three 40 mpg (hwy) Toyota Corolla vehicles.

Bulk dispensed biofriendly soaps and cleaning products are used throughout all guest rooms, and aerosol cleaning products are no longer purchased. Serving water only on demand in the restaurant and doing away with table cloths saves water and energy. Cleaning linens only on demand in rooms also saves energy and water. Irrigation reductions save seven million gallons per year. Forty thousand pounds of food waste is composted annually on site in two large Earth Tub composters. In-room recycling allows guests easy access to recycle bins. Bottled beer was eliminated and replaced with beer on tap, saving 10,000 pounds per year in glass waste. Low-flow fixtures were installed in all bathrooms and kitchen areas. Recently, Smart Systems were installed in room air conditioners to optimize guest comfort while saving energy. Two acres of non-native grassland was restored to a natural state consisting of rocks, native grasses, and shrubs. Sustainable food choices at Zion amount to seven percent of total menu items.

The environmental performance results of these initiatives are significant. From 2000 to 2006, Xanterra’s Zion operations environmental performance and progress toward 2015 Environmental Vision Goals is as follows:

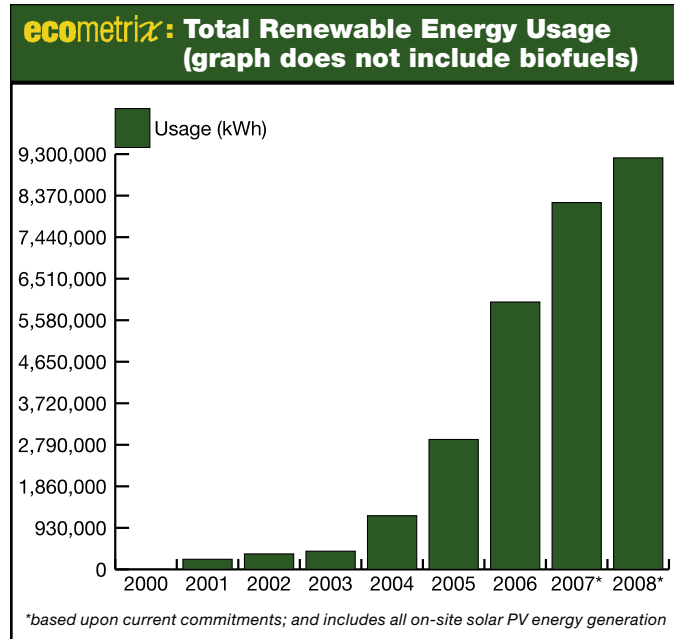
- 7 percent decrease in greenhouse gas emissions (from 2,567 to 2,355 tons of CO<sub>2</sub>; note that this figure does not include renewable energy purchases or carbon offsets)
- 1,427,000 kWh per year purchased in renewable wind energy and on-site solar PV generation (this represents more than 85 percent of the total electricity usage)
- 36 percent diversion of solid waste from the landfill (140,000 pounds diverted, recycled and composted; 248,000 pounds to landfill)
- 50 percent reduction of water use (saving nine million gallons per year)
- 100 percent reduction in “dirty” fuel oil usage (retrofitting old fuel-oil fired boilers to propane)
- 20 percent increase in sustainable cuisine (from 7.2 to 9.3 percent of all food purchases at Zion)
- 6 percent decrease of total fossil fuel usage (on a total Btu basis)
- 13 percent improvement of average fuel economy (to 23.9 mpg average)

These results occurred while experiencing an increase in visitation over the same period

A rigorous ISO 14001-certified environmental management system that defined environmental priorities, set goals, and assigned responsibilities was the impetus to achieve results. Xanterra’s Zion operation also joined the EPA National Environmental Performance Track program and became an EPA Energy Star Partner for further third-party verification of its programs.

Many of these new measures are explained in an interactive video display that guests can view in the lodge lobby. The display includes real time monitoring of the on-site solar PV system.

# RENEWABLE Energy



Year	Usage (kWh)
2000	0
2001	226,538
2002	346,442
2003	407,615
2004	1,202,181
2005	2,909,419
2006	5,987,723
2007	8,214,723*
2008	9,214,723*

*The most significant way for any company to affect climate change and reduce greenhouse gas emissions is to rid itself of its dependence upon fossil fuels. One of the most effective ways to do that – besides shutting down – is to develop clean, emission free, renewable solar, wind, or geothermal energy at our operations. In the past few years, Xanterra has dedicated significant resources to increasing renewable energy at its facilities.*





# 26 ONE OF THE COUNTRY'S LARGEST Solar PV Energy Installations



In 2007, we have taken our renewable energy portfolio to a new level. We have done this by planning to install one of the largest non-utility-owned renewable energy systems in the country. Under design and construction as of the time this report is going to print, this is a one megawatt (1 MW) solar photovoltaic (PV) energy system being constructed at the sunniest place in the country, our Death Valley operations.

## **PV SYSTEM RESULTS**

This system, the size of seven football fields, will generate on site more than 2.2 million kWh per year for at least 30 years. This is enough electricity to power more than 500 American homes. It will reduce greenhouse gas emissions by 1.53 million pounds each year for more than 30 years, totaling 23,000 tons of CO<sub>2</sub>.

This system is not only the largest renewable energy system in the country among all private companies; it is also the largest in the entire tourism industry, the entire Department of Interior, and among any national park concessioners.

Once operational (construction will be complete in February 2008), Xanterra will instantaneously reduce its greenhouse gas emissions by more than 35 percent at Death Valley, and by four percent company-wide. This system also assists in furthering national security goals of energy independence. It exceeds the President's new Executive Order that calls upon concessioners (and all federal agencies) to reduce greenhouse gas emissions "...through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015."



## On-site Renewable Energy Generation Systems at Xanterra Operations

Xanterra Location	Type of system	Size (kW)	Generation (kWh/yr)
Death Valley**	Solar PV	1,000 kilowatt	2,200,000
Zion	Solar PV	15 kilowatt	21,000
Yellowstone	Solar PV	2.4 kilowatt	3,100
Rocky Mountain	Solar PV (battery bank)	2.4 kilowatt	2,700
Crater Lake	Solar PV (remote)	0.2 kilowatt	300
Mt. Rushmore	Kitchen grease to biodiesel recycler	40 gallon	400 gallons/yr
Yellowstone	*Kitchen grease to biodiesel recycler	80 gallon	Up to 9,000 gallons/yr

\*This technology has been purchased and is on site, but as of the printing of this report, it is still under development.

\*\* As of the time of this report going to print, this is in the process of being installed.

### OTHER ON-SITE SOLAR PHOTOVOLTAIC SYSTEMS

In addition to the 1-MW PV system described above, Xanterra has four other PV systems installed or under construction as of the time of this report going to print. Two years ago, Xanterra installed grid-tied PV systems at both Zion Lodge and Yellowstone. At Zion, a 10,000 watt system was installed on an administration building and a 5,000 watt system was installed on a dorm. At Yellowstone, two 1,200 watt PV systems were installed on two new employee houses. At Crater Lake, a small PV system is used to power a remote office space for the marina operations. A 2,400 watt roof-mounted PV system is currently under construction at Rocky Mountain National Park's retail store atop Trail Ridge Road. This system is unique in that it is off-grid and requires a battery bank for storage of electricity. It is due to be completed Fall of 2007.





***“Don’t blow it—good planets are hard to find.”***

***Time Magazine***

### **WIND AND OTHER RENEWABLE POWER**

At Crater Lake, Mt. Rushmore, and Zion, more than 45 percent of the entire operations’ electricity usages are derived from wind power. At Bryce Canyon, more than 36 percent of all electricity is from wind power, and at Yellowstone and the Grand Canyon, more than six and seven percent, respectively, is derived from wind power.

In total, Xanterra used 8,214,723 kWh per year in renewable wind, solar, or geothermal energy in 2007 (although Xanterra uses a large amount of hydroelectric power, that power source is not included in these figures). This represents 18.2 percent of all national park electricity usage and 11.5 percent of all Xanterra operations’ electricity usage.

Xanterra has already exceeded its 2015 goal of powering the company with a minimum of seven percent renewable energy, and the company has already exceeded the 3 percent goal set with the EPA to become a Green Energy Partner. By using wind power, each year Xanterra prevents 6.1 million pounds of carbon dioxide from reaching the atmosphere. This is equivalent to driving a car 6.8 million fewer miles or planting 900 acres of trees.



#### **GREEN-E CERTIFICATION PROGRAM**

All Xanterra wind power purchases are certified under the Green-e certification program for renewable electricity.

(Note: Wind-generated electricity is fed to Xanterra operations through the same transmission grid that distributes power from traditional, polluting coal-fired power plants).

### **TURNING USED COOKING OIL INTO BIOFUEL**

Each year, Xanterra pays a licensed service provider to recycle off site tens of thousands of gallons of used kitchen grease – a waste product of kitchen fryers. On-site reuse of this material as a biofuel can significantly reduce the environmental impact of Xanterra’s kitchen operations while providing a renewable fuel – biodiesel – that can be burned in boilers and vehicles.

At Yellowstone and Mt. Rushmore, Xanterra recently purchased biodiesel conversion equipment to do just that. In addition to delivering significant environmental benefits, this will also serve as a highly visible element of the company’s environmental outreach and education program.

By eliminating the need to transport used oil hundreds of miles away for recycling, Xanterra will also lower its air emissions and significantly reduce its contribution to global warming by utilizing less fossil fuel. (Biofuel is considered a renewable “carbon neutral” fuel which emits carbon dioxide only recently absorbed by living plants, as opposed to fossil fuels).

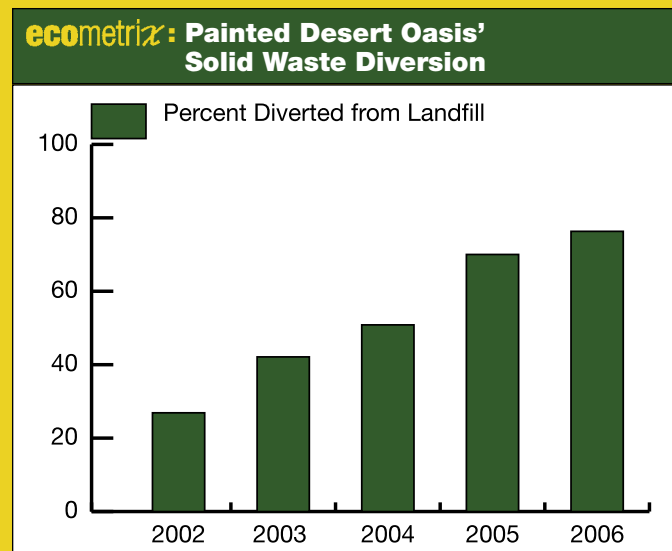
Only a small volume of biodiesel has been produced to date as part of this pilot project. Future large volumes of biodiesel will be used to power boilers as well as diesel fleet vehicles.



# Case Study: PETRIFIED FOREST NATIONAL PARK WASTE MANAGEMENT

Often it's the large national park operations like Yellowstone and Yosemite that have the money, staffing, and expertise to develop and implement award-winning, cutting-edge waste management programs. But environmentally speaking, "good things can come in small packages," and one of Xanterra's smallest operations, Painted Desert Oasis (PDO) located in a remote stretch of desert at Petrified Forest National Park, truly is an example of that. PDO takes recycling and waste management to a level possibly unseen in any national park.

The employees at PDO are the primary reason for the operation's waste management success. They go so far as to literally count newspapers, weigh cans of recyclables daily, and record every toner cartridge or piece of electronic equipment that is sent off for recycling. And it's not just line employees. In order to get an exact assessment of the amount of refuse being sent to the landfill in a given haul, the General Manager completed a waste audit in early 2006. As part of the audit, he literally climbed into a dumpster, removed the bags, weighed and counted each one and then returned them to the dumpster to get an exact calculation of the actual weight and volume of trash. Now that's commitment!



One of PDO's most significant partners has been the local Navajo Reservation. In 2002, employees began collecting food waste for the local Navajo ranchers. This "slop" is then used by the ranchers for their stock animals. Over the course of the past five years this has diverted more than 7,600 pounds of waste from the landfill; over 1,400 pounds in 2006 alone.

In 2005, PDO began purchasing "Blue Bird" flour locally grown on the same Navajo Reservation. Instead of large paper sacks, the flour is delivered in cloth bags. Once emptied, the sacks are returned to the Reservation to be refilled for the next delivery – completely eliminating a waste stream. Once the bags have lived out their useful life for flour delivery, a PDO staffer turns them into aprons for kitchen staff to wear and which are also available for sale in the on-site gift shop.

All newspaper is saved and reused to wrap fragile items visitors purchase in the gift shops. Good quality cardboard boxes are reused in the same manner.

If ever proof was needed that small steps make a big difference, the results are here. When PDO began tracking its Ecometriz waste data in 2001, the property's diversion rate was 27 percent. By any other company or municipality standard, that diversion rate would be impressive. In 2006, PDO's diversion rate was 76 percent and included 17 different waste streams! That could be one of the highest, if not the highest, waste diversion rates inside a national park.

All of this is in addition to PDO selling recycled content T-shirts, bulk dispensing all food condiments, using recycled content napkins, and banning all inefficient incandescent lighting and pesticide use.

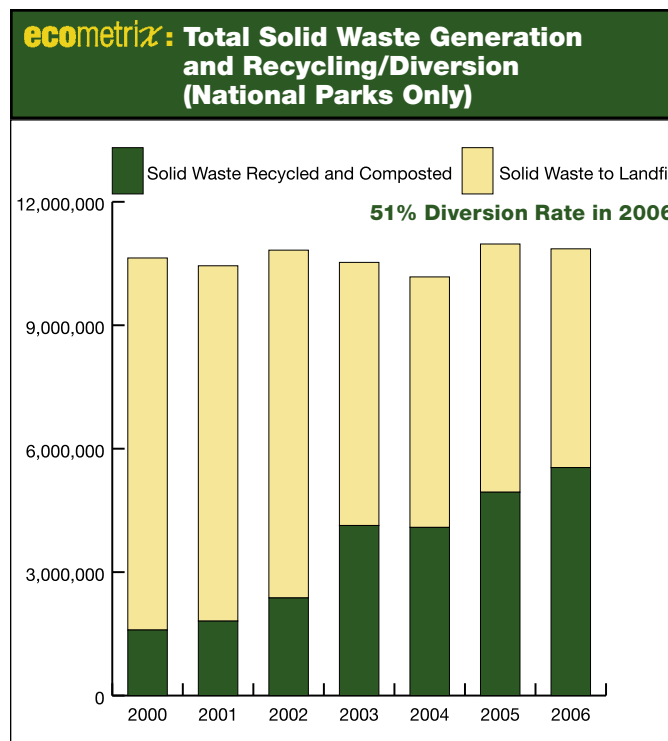
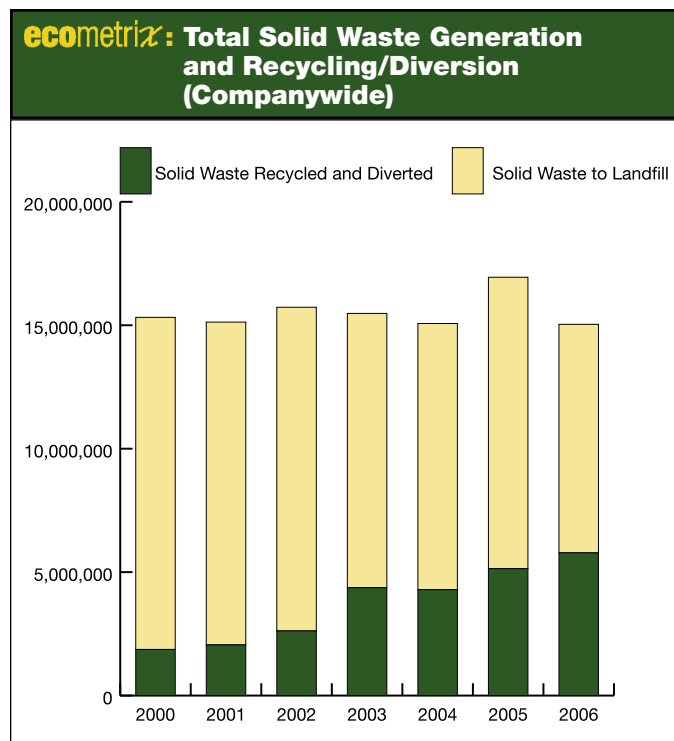


# SOLID Waste

Waste generated by park concessions includes everything from packaging and food refuse to scrap metal and mercury switches. Solid waste is generated not only by Xanterra and its employees, but also by the guests the company serves.

Effective management of waste requires a comprehensive program of awareness, education, action, and commitment to continual improvement. Reducing waste by not generating it in the first place is the primary goal of Xanterra's waste management program.

<b>ecometriz: Total Solid Waste Generation and Recycling/Diversion</b>								
	2000	2001	2002	2003	2004	2005	2006	% Change 2000-2006
Solid Waste to Landfill (lbs)	13,451,191	13,076,047	13,110,093	11,110,248	10,780,736	11,801,975	9,257,622	-31
Solid Waste Recycled and Diverted (lbs)	1,868,118	2,052,550	2,619,191	4,369,103	4,291,104	5,142,710	5,945,037	218
Annual Diversion Rate (percent)	12.19	13.57	16.65	28.23	28.47	30.35	39.11	321
Solid Waste Recycled/ Room Night (lbs)	1.84	2.11	2.70	4.48	4.46	5.40	6.19	335



Xanterra's most significant waste to landfill reductions have come from new composting efforts. In the last two years Xanterra has drastically increased its capabilities with functional composting facilities at Zion, Mt. Rushmore, South Rim's Phantom Ranch, and Yellowstone. Through these programs, close to three million pounds of biodegradable waste, which was previously going to a landfill, is now being turned into inert organic matter to be used in gardens. Yellowstone, for example, composts the greatest volumes, now diverting almost 70 percent of its entire solid waste stream, recycling more than 500,000 pounds and composting 2,700,000 pounds in 2006. Yellowstone is unique in that it has access to a large federally owned commercial composting facility. Other Xanterra operations use Earth Tub composters to "digest" up to 70,000 pounds of food and vegetative wastes each year.

Thanks to these composting programs and Xanterra's ongoing recycling and waste reduction efforts, the company diverted more than 5.94 million pounds of solid waste in 2006, 38 percent of all waste generated. At Xanterra's national park operations, 51 percent of all solid waste was either recycled, composted, or diverted from the landfill, representing a more than 200 percent increase since 2000, from 1.87 million pounds to 5.94 million pounds of aluminum, glass, plastic, paper, cardboard, tires, scrap metal, and even manure (from equestrian operations) recycled, composted, or diverted in 2006. This already exceeds the new Executive Order goal set under the Bush administration.

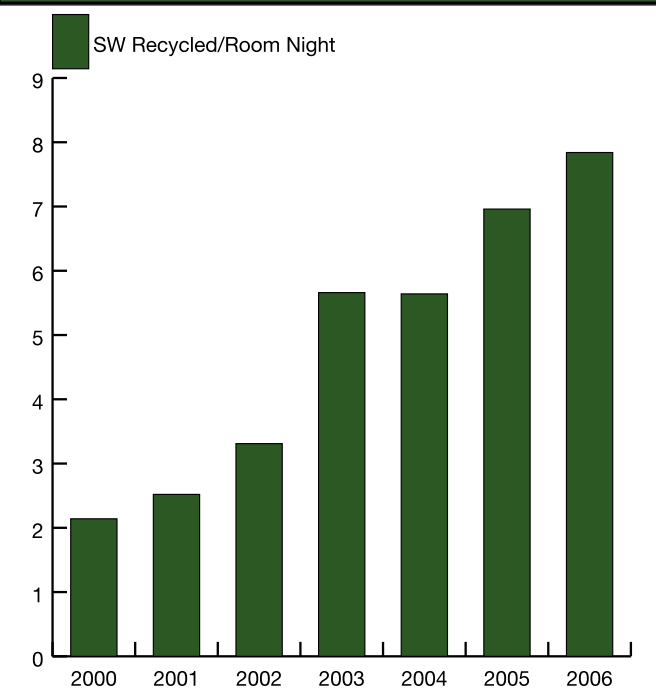
Waste diverted or recycled per room night (attributed to increased in-room recycling and guest awareness) increased 326 percent from 2000 to 2007. Solid waste generation (recyclables, compostables, and waste to the landfill) has remained somewhat steady.

#### WASTE REDUCTION AND RECYCLING PRACTICES AT XANTERRA'S NATIONAL PARK OPERATIONS

Companywide, Xanterra recycles and diverts more than 25 materials in national parks (5.8 million pounds per year) including:

- Aluminum, tin, steel equipment and scrap metals
- Plastic bottles and containers
- Glass bottles and containers
- Cardboard, paperboard, office paper, magazines, newspaper
- Cooking oil
- Universal wastes, batteries (lead acid, alkaline, NiMH, Lithium), CFL lamps, tires, televisions, CRTs, computer electronics, toner cartridges, chlorofluorocarbon (CFC) materials, mercury thermostats, and used motor oil.

#### ecometriz: Solid Waste Recycled Per Room Night (National Parks Only)



# HAZARDOUS Waste

<b>ecometriz: Total Hazardous Waste Disposed and Universal Waste Recycled</b>							
	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Solvent (Hazardous Waste)	203	273	115	70	63	0	0
Used/Waste Oil	5,536	6,875	1,600	23,885	6,450	2,045	2,708
Car Batteries	111	313	5,680	964	970	115	142
Household Batteries	135	0	5,828	4,470	7,998	8,145	7,653
Fluorescent Tubes	3,360	2,657	1,092	3,936	4,625	6,267	5,214
Mercury Switches	20	30	25	7	16	1	8
Electronics (lbs)	0	0	625	2139	18247	4100	3600

*Xanterra currently recycles all Universal Waste including electronics (computers, cell phones, CRTs, printers, etc.), batteries (camera, car, household, lead-acid, nickel metal hydride, lithium, and alkaline), pesticides, mercury switches, PCB-containing ballasts, and fluorescent lamps. Xanterra's goal is to generate zero RCRA-regulated Hazardous Waste. As can be seen in the chart above, it is best that solvents disposal (a RCRA Hazardous Waste) decreases and all the other wastes either remain stable or increase. That indicates the company is capturing those streams and recycling them as they are generated.*

*Since 2000, for example, fluorescent lamp recycling has continued to increase as the company completes more fluorescent lamp retrofits and as old lamps burn out. Electronics waste recycling also continues to increase as the company gets ahead of new state laws that will require recycling of CRTs and other electronic equipment. Household batteries, mercury switches, and used oil have all remained stable or increased as the company becomes better at capturing and recycling those waste streams.*

## **FINALLY: NON-TOXIC GREEN CLEANERS THAT WORK!**

Xanterra has spent years scrupulously fact-checking vendors' marketing claims of alleged eco-cleaners. In 2006, Xanterra finally identified "green" cleaners that pass our triple test of: cost effectiveness, cleaning effectiveness, and environmental performance. These are Ecolab's new line of Green Seal certified cleaners. The new line of "green" products are being phased in companywide, but are currently in full use at Yellowstone, Bryce, Zion, and several other locations. These cleaners are:

- Non-toxic to humans when diluted for use
- Non-combustible and non-corrosive to the skin and eyes
- Safe for aquatic life when diluted for use
- Made from readily biodegradable ingredients
- Free of chlorine, NPE, EDTA or NTA
- Contain VOC levels under one percent when diluted for use
- Free of known carcinogens and reproductive hazards

None is petroleum-or hydrocarbon-based, contains ozone-depleting substances, or is a chlorinated solvent. All are derived from renewable resources, have a flammability rating of zero, are biodegradable and meet California standards for VOCs.

Green Seal certifications place strict requirements for chemistry, packaging, performance, toxicity, and labeling. These cleaners include dish detergent, glass cleaner, all-purpose cleaner, deodorizers, and bathroom cleaners.





### **GOLF COURSE AUDUBON CERTIFICATION HELPS REDUCE PESTICIDES**

The Furnace Creek Golf Course at Death Valley has achieved designation as a Certified Audubon Cooperative Sanctuary by the Audubon Society. The Furnace Creek golf course is the 42nd course in California and the 630th in the world to receive the honor.

To reach certification, a course must demonstrate that it is maintaining a high degree of environmental quality in a number of areas. These categories include: Environmental Planning, Wildlife & Habitat Management, Outreach and Education, Chemical Use Reduction and Safety, Water Conservation, and Water Quality Management. One specific example of what makes the Furnace Creek course “green” is a reduction in pesticide usage by 84 percent.

Audubon certification is a perfect fit for a golf course located within a national park. Xanterra is one of only a few National Park Service concessionaires that have a Certified Audubon Cooperative Sanctuary within its operations.

### **LEAD FREE ZONES GET THE LEAD OUT AT XANTERRA MARINAS**

Lead is a known neurotoxin that is ecologically-persistent and, when inadvertently added to the natural environment, can be ingested by birds, fish, and other small vertebrates. It pollutes ground water and is highly dangerous to children. In 2003, Xanterra completely banned all lead-containing lures, weights, lines, and other fishing equipment from its national park marinas.



### **GREEN VEHICLE MAINTENANCE PREVENTS POLLUTION**

Maintaining a fleet of several hundred snowmobiles, shuttles, cars, trucks, snowcoaches, tractors, boats, and more can produce significant pollution if not done properly. Xanterra’s vehicle maintenance facilities employ state-of-the-art environmental practices and technologies that go well beyond compliance, integrating pollution prevention practices that protect water resources and reduce emissions.

#### **For example, at Yellowstone, such practices include:**

- Using only non-hazardous, aqueous-based solvents for all parts washing and brake cleaning (almost completely eliminating the hazardous waste stream)
- Burning all used oil for heat recovery in the vehicle maintenance area (eliminating the waste stream);
- Recycling or recapping all old truck tires
- Using only non-chlorinated and refillable spray bottles for brake and carburetor cleaning
- Using brake and clutch materials that are asbestos free

#### **Recycling:**

- All ethylene and propylene glycol (antifreezes) on site for repeated use; nontoxic propylene glycol is also replacing ethylene glycol as vehicles receive maintenance;
- All chlorofluorocarbon (CFC) refrigerants (Freon);
- All spent solvents including 55 gallons of paint solvents in 2001;
- All mercury containing fluorescent lamps (including Phillips GreenTips lamps);
- Roughly eight tons of scrap copper, steel, and aluminum in 2001;
- up to 100 used car batteries per year; and
- all oil filters.

### **NATIONAL PARK SYSTEM’S FIRST PROPANE CYLINDER RECOVERY PROGRAM**

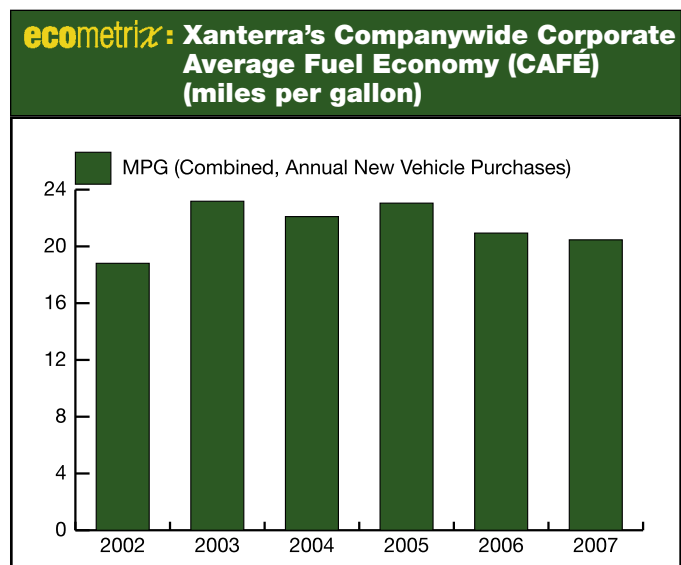
Xanterra’s Yellowstone operation, in conjunction with the National Park Service, is the first in the country to develop a propane cylinder recovery program. Aimed at campgrounds that generate thousands of small propane cylinders each season, the program includes custom-made bins placed in campgrounds to collect approximately 3,000 one-pound cans that, in the past, have been sent to landfills. Many of the cylinders contain significant amounts of recoverable gas. The mobile propane bottle recycler (PBR) unit drains discarded propane cylinders into a storage tank and crushes the empty hulks to be recycled as scrap metal. As a closed-loop system, the PBR is powered by recovered propane.

# TRANSPORTATION

It is predicted that within the next 50 years there will be more than one billion vehicles on the planet's roads as society produces more than 10 million new vehicles each year. Currently, the 260 million combustion engine vehicles in the U.S. emit vast amounts of air pollution, are noisy, and require plenty of maintenance – which generates even more pollutants. Xanterra operates a fleet of hundreds of buses, cars, trucks, snowmobiles, boats, snow coaches, shuttles, and other vehicles.

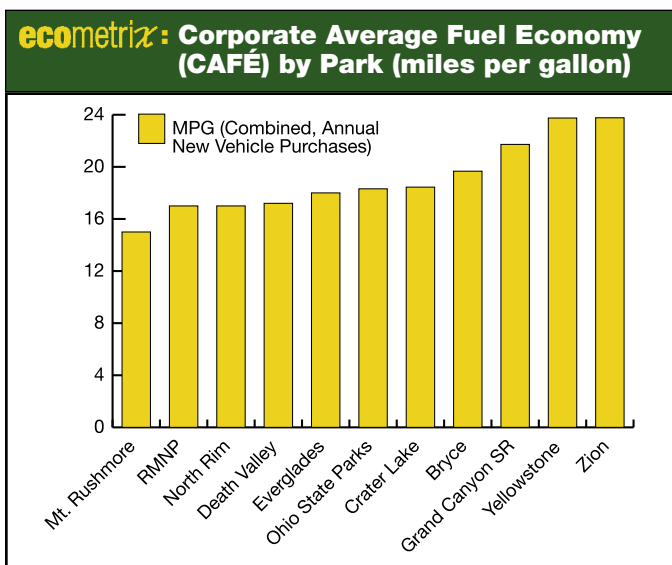
## THE INDUSTRY'S FIRST VOLUNTARY CAFÉ STANDARD

Xanterra's most significant transportation initiative is its CAFÉ (corporate average fuel economy) standard. Under this initiative, by 2015, Xanterra is voluntarily seeking to increase the fuel efficiency of its annual fleet vehicle purchases to 35 miles per gallon (combined city/highway) for all new vehicles purchased.



*In 2002, Xanterra's actual CAFÉ was 18.8 miles per gallon. By 2007, the company increased its CAFÉ by 8.0 percent to 20.4 miles per gallon. In between that period, Xanterra purchased many new hybrid and efficient vehicles, which resulted in a 19.1 percent increase in companywide annual fuel efficiency in 2005. However, since 2005, the required purchases of new trucks, passenger vans, and maintenance vehicles has resulted in a 12.1 percent decrease in annual average fuel economy. To address this decline, Xanterra now has engaged the environmental affairs department in assisting properties in locating and approving the most efficient vehicle in its class.*

*Corresponding to the CAFÉ increase, total gasoline and diesel consumption has increased 20.5 and 7.5 percent, respectively, from 2000 to 2006. Again, the suspected cause of this is the required purchases of light duty trucks and passenger vans, which are relatively inefficient.*



### ecometriz: Total Transportation Fuel Usage (1,000 gallons)

	2000	2001	2002	2003	2004	2005	2006
Gasoline	300,180	290,919	299,626	323,156	309,074	360,590	361,823
Diesel	117,729	109,184	111,022	91,572	107,343	100,107	126,517

Using the Department of Energy's Fuel Economy Website, we have formulated a policy mandating purchase of the most fuel-efficient vehicles in their class. In addition, Xanterra's strict maintenance schedule ensures that all vehicles remain at their most fuel-efficient.

In the past few years Xanterra's companywide fleet has grown to include:

- Four hybrid electric Toyota Priuses that get more than 52 miles per gallon and are rated by the American Council for an Energy-Efficient Economy (ACEEE) as the "greenest vehicles on the road" (all rated PZEVs, Partial Zero Emission Vehicles)
- 54 zero-emission (curbside) electric vehicles
- 79 cleaner-burning four-stroke engine snowmobiles and 42 four-stroke engine boats that are 65 percent more fuel-efficient than the two-stroke machines they replaced
- 16 Toyota Echos that get more than 42 miles per gallon (hwy) (all rated ULEVs, Ultra-Low Emission Vehicles)
- 7 new Toyota Corollas that get more than 40 miles per gallon (hwy) (all rated ULEVs)
- 20 buses retrofitted with anhydrous alcohol injection systems that increase fuel economy by 19.7 percent
- One new Ford hybrid Escape SUV, the first hybrid SUV in the world; it gets 40 miles per gallon (hwy)
- Four new clean-burning propane-fueled maintenance utility vehicles
- Two propane-burning passenger shuttles and four electric-to-propane retrofits of vehicles
- Numerous diesel vehicles running on a 20 percent blend of biodiesel and petroleum diesel



### CLEAN MARINA CERTIFICATIONS

To date, Maumee Bay State Park, Geneva Marina, and Everglades National Park, have all received their respective state's Department of Environmental Protection Agency's "Clean Marina" certifications. Xanterra's Everglades facility was the first federally owned marina to achieve such certification.

The Clean Marina program was developed to help educate marinas, boatyards, and boaters on the importance of protecting waterways and the environment. Participation in the program is voluntary and businesses must meet rigorous pollution control standards that consist of stringent requirements in boat fueling, cleaning, maintenance, waste management, sensitive species management, and emergency response measures.





# SUSTAINABLE DESIGN and Construction

## RAISING THE “DEVELOPMENT BAR”: SUSTAINABLE DESIGN GUIDELINES

Recently, Xanterra developed its Guidelines for Environmentally Sustainable Design and Construction. This document guides Xanterra employees and partners through the process of making a building as environmentally sustainable as possible. These guidelines define Xanterra’s expectations for all contractors, subcontractors, architects, engineers, consultants, and vendors working with Xanterra on the design, construction, or rehabilitation of buildings in national parks. Xanterra uses the guidelines to ensure that new construction and renovations of buildings will be as environmentally sensitive as possible.



As a long-time member of the U.S. Green Building Council (USGBC), Xanterra also uses the Leadership in Energy and Environmental Design (LEED) program criteria as a guideline for its construction projects. The USGBC, a coalition of leading organizations from the building industry, established the LEED rating system to certify buildings as “green” based on a

credit system of the environmental measures implemented. The LEED program is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings and provides a complete framework for assessing building performance and meeting sustainability goals.

## THE CONCESSION INDUSTRY’S LEED-CERTIFIED BUILDINGS

In 2004 at Yellowstone National Park, Xanterra reclaimed a formerly contaminated brownfield site and transformed it into a U.S. Green Building Council Leadership in Energy and Environmental Design (LEED)-certified employee housing development—the first of its kind in the Yellowstone area, in Montana, and in the entire national park system.

Xanterra has continued its commitment to sustainable design and construction in national parks by adding two more major sustainable development projects:

- 1) LEED Silver Certified Annie Creek Restaurant and Gift Shop at Crater Lake National Park; and
- 2) Green Suites at Zion National Park Lodge.

Buildings in the United States account for:

- 65% of total electricity consumption
- 36% of total primary energy use
- 30% of total greenhouse gas emissions
- 136 million tons of construction and demolition waste
- 12% of potable water use

(Source: USGBC.org)



## SUSTAINABLE DESIGN AND CONSTRUCTION AT CRATER LAKE

In 2006, Xanterra designed and constructed the Annie Creek Restaurant and Gift Shop building which received LEED Silver certification under the US Green Building Council's green building rating system. This building is now the second building in the concession industry to be LEED certified. Environmental measures for this 26,000 square foot building that welcomes visitors to Crater Lake include:

- 25 percent of building materials include recycled content.
- Recycled or salvaged 77 percent of waste from construction, demolition and land-clearing.
- Sourced 42 percent of building materials from local manufacturers with over half of these materials being harvested locally.
- Carpets exceeded the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program standards.
- Oregon Energy Code exceeded by 18 percent.
- Reduced water use by 50 percent. This includes using a highly efficient, low-temperature dishwasher, low-flow faucets, dual-flush toilets and waterless urinals.
- Eliminated permanent irrigation.
- Filtered and treated storm water through the use of a "natural" drainage ditch.
- Sourced 100 percent of the building's electricity from renewable wind power.
- Dedicated a recycling area located in the building to capture recyclable material during the operation of the building.
- Used only highly efficient custom fixtures with fluorescent lamps, occupancy sensors, and multi-level dimming systems. This, in conjunction with passive daylighting, minimizes electricity usage.
- Implemented controls that allow for adjustment of ventilation, temperature & lighting to ensure that the building operates at optimum efficiency.
- Eliminated use of ozone depleting CFC-based refrigerants, HCFCs or halons
- Adopted an operational "green" policy by using only environmentally friendly cleaners, soaps and chemicals in the building.



## SUSTAINABLE DESIGN AT XANTERRA'S ZION LODGE "GREEN SUITES"

In 2006, Xanterra renovated six guest suites at Zion Lodge to be as environmentally sustainable as possible. Now called "Green Suites," these rooms employ nearly every sustainable alternative to reduce consumption of natural resources, eliminate waste, and improve guest comfort. Here are highlights:

- **All Natural Biodegradable Soap**, Shampoos and Moisturizers provide a healthy and eco-friendly alternative to individually packaged non-biodegradable amenities. Bulk dispensers eliminate thousands of wasted plastic bottles.
- **Organic Bamboo Sheets and Linens** are made from one of the fastest growing and most sustainable plants on earth, not requiring fertilizers or pesticides to grow.
- **Filtered Drinking Water Faucets** from clean, natural springs within the park improve taste and encourage the use of reusable water containers.
- **Complimentary Organic Coffee and Tea** (and two mugs) are certified organic fair trade coffee, grown without pesticides, using a shade grown method to reduce deforestation.
- **Compact Fluorescent Lighting** reduce energy consumption by 70 percent and last ten times longer than standard incandescent bulbs.
- **Key Card Lighting Controls** similar to popular systems throughout Europe, make lighting within the room operable only once the guest inserts their key card into a slot by the entry door, saving 15 percent of energy.
- **Biodegradable, non-toxic Green Seal certified Cleaners** are used in all rooms.
- **Renewable Solar & Wind Energy** is used to power 85 percent of all power.
- **Automated Heat and Air Conditioning** sensors detect body heat and motion to control the temperature within comfortable predetermined set points.
- **LED Nightlights** prevent the bathroom light from being used as a nightlight, using less than dollar of energy per year.
- **Sustainable Bamboo Floor Entry Way** saves trees. Bamboo can be harvested in only three years, as opposed to 50 years for hardwoods.
- **Recycled Content Interface Entropy Carpet** is more than 70 percent recycled content making it the highest recycle content carpet available on the market. At the end of its useful life, it will be 100 percent recycled back into new carpet.
- **Dual Flush Toilets** provide two options for flushing utilizing 0.8 gallons or 1.6 gallons per flush, saving 67 percent more water than a standard toilet.

# WATER

Xanterra operates three marinas and has numerous facilities located adjacent to pristine lakes. This includes Crater Lake, ranked as the country's clearest water, and sensitive habitats such as the Everglades. Xanterra is also located in desert climates like Zion, Death Valley, Bryce Canyon, and Grand Canyon National Parks, where water resources are scarce. Therefore, the company recognizes that water quality protection and water conservation are of the utmost importance when it comes to operating tourist facilities in such sensitive areas.

As a standard practice, Xanterra has equipped nearly all guest rooms with water efficient fixtures: showers use between 1.5 and 2 gallons per minute, all new toilets consume at worst 1.6 gallons per flush, and faucet aerators decrease flow to between 0.5 and 1 gallon per minute.



## LOW-FLOW ISN'T LOW ENOUGH

One of the newest technologies on the market is the Zurn urinal, using only 0.12 gallons to flush, an 85 percent reduction over even the most efficient dual flush toilets. Xanterra has tested this technology at the Grand Canyon and it has proven effective.

At Crater Lake, the South Rim of the Grand Canyon, Bryce Canyon, Yellowstone, and several other park locations, the company has installed ultra low-flow faucets and toilets, including waterless urinals and dual flush toilets. At Bryce Canyon, 40 dual-flush Caroma toilets were installed in 2006. Waterless urinals at public restrooms in three lodges save approximately 150,000 gallons of water per year.

To save water at Zion, the company reduced irrigation of landscaped areas, resulting in water savings of more than 9 million gallons in one season, decreasing usage by 40 percent. Our companywide linen reuse program, where towels and sheets are only laundered when directed by guests, has an estimated 75 percent participation rate. Additionally, at the Grand Canyon, Xanterra uses around 60,000 gallons of reclaimed water for nonpotable purposes in its kennels, employee bathrooms and landscape irrigation.

At Zion, the South Rim, and several other locations, Xanterra continues to educate guests and staff on the benefits of water conservation, serves water only on request in the dining rooms, and implements an aggressive maintenance program where all water leaks and potential leaks are immediately reported and repaired.

## SAVING WATER IN A DESERT: DEATH VALLEY NATIONAL PARK

With an annual rainfall of less than two inches, Death Valley is a prime area to target water efficiency and conservation efforts. Currently, Xanterra receives water for its resort operations there from several springs located on site. Our water usage there has been approximately 428,000,000 gallons per year. In 2005 and 2006, Xanterra embarked upon a water conservation and efficiency effort to reduce that volume.

Since you can't conserve what you can't measure, as a first task Xanterra and the NPS installed new water measuring devices and valves to control and measure the quantity and flow of water received. Xanterra has since kept careful records of water use and flows. Next, Xanterra implemented the following water conservation measures:

- replaced all open irrigation ditches with pipe; installed an impermeable liner in the golf course and property ponds and open irrigation ditches;
- replaced water closets with low flow units as replacement becomes necessary; installed low-flow shower heads at lodging units; and
- employed an environmental/resource management employee, whose duties include improving water use and conservation at Xanterra facilities.





# ENVIRONMENTALLY Preferable Procurement

Each year, Xanterra purchases a vast number of goods and services. The manufacture, distribution, use, and disposal of these products can have a profound impact on the environment.

Xanterra's Environmentally Preferable Procurement (EPP) program guides staff members in making purchases that are better for the environment without sacrificing quality. These products may: contain recycled materials, be more recyclable, be less toxic or more biodegradable, have less packaging, cost less to transport, perform better, be more durable or use less energy, or consume fewer natural resources over their useful life.

## Xanterra's EPP Program Includes:

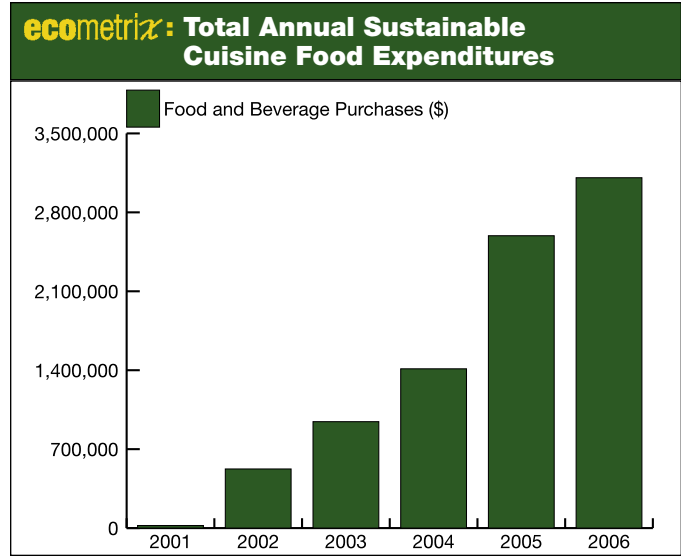
- An EPP policy with quantifiable goals and targets
- A formal assessment protocol to determine if a product or service is environmentally preferable
- An inventory of environmentally preferable products
- An environmentally preferable capital expenditures protocol to assist in weighing the attributes and impacts of capital items prior to purchase
- A letter to contractors explaining environmental goals and contractor responsibilities
- A letter to vendors and a policy on product packaging that explains environmental goals and vendor responsibilities
- A guide for properties on how to purchase fuel-efficient vehicles
- A sustainable cuisine program to purchase more organic, local, sustainable food products
- A formal companywide policy banning certain species of fish from menus and recommending others

Each year the company adds new environmentally preferable products. Our most visible or meaningful new environmentally preferable products include our Green Seal certified cleaners used internally; countless new energy efficiency technologies (see Energy and Renewable Energy sections); our line of Seventh Generation paper and cleaning products and Kiss My Face beauty products sold in retail stores; and our additional sustainable cuisine products (see Sustainable Cuisine section).

This past year, the U.S. Environmental Protection Agency (EPA) presented Xanterra South Rim with a Green Purchasing Gold Achievement Award for purchasing numerous items with recycled content. Xanterra was one of only 11 organizations out of 1,900 to receive a Gold Achievement Award. Examples of products include using chlorine-free, 100 percent post-consumer recycled-content copy paper, and selling blankets, T-shirts, and sweatshirts that contain between 60 to 100 percent recycled-content materials. In addition, we close the loop by buying back the equivalent of more than 10 percent of the paper and 25 percent of the plastic we recycle. In 2005, Xanterra avoided \$55,000 in disposal costs through its recycling and waste prevention program.



# SUSTAINABLE CUISINE



**ecometriz: 2001-2006 Total Sustainable Cuisine Expenditures by Food Category**

Liquor	\$7,899
Beer	\$347,680
Wine	\$236,728
Coffee	\$790,264
Dairy	\$1,384,030
Game	\$400,294
Meat	\$1,002,265
Poultry	\$611,266
Produce	\$1,454,960
Seafood	\$2,051,709
Other	\$315,473



## **FOOD THAT PROMOTES HEALTH AND ENVIRONMENTAL PROTECTION**

In our current global food system it has become difficult to know where our food products originated. With more food-based scares: E-Coli in spinach, tainted seafood from China, mad-cow, etc., our guests have become more concerned about the safety of our food system. This has driven more interest in local and organic foods.

Sustainable cuisine is the practice of using products that are grown, harvested, processed, packaged and distributed with the least amount of environmental impact. Typically these products are local or organic. With its sustainable cuisine program, Xanterra is trying to push the limits of this new, ecologically sound approach to food service.

Since our last report, Xanterra food & beverage directors, chefs, and purchasing agents have increasingly reached out past their normal distribution channels looking for what is available in their local region from farmers, ranchers, and artisan food producers.

Sustainable cuisine purchases continue to grow in volume and at an increased number of locations across the company. Purchases more than doubled since 2004, increasing 120 percent, from \$1.4 to \$3.1 million, with significant increases coming in 2005 and 2006 from virtually every product category. We realize there is still much room for improvement in this area since this is a relatively small number compared to total food purchases. Still, what began in 2000 with a company-wide seafood policy that ensured Xanterra served only sustainable seafood in its 64 restaurants has grown into a nationally acclaimed sustainable cuisine program that includes almost all Xanterra properties.



***“What we eat has changed more during the past thirty years than in the previous thirty thousand. Trans-fats, genetically engineered soybeans, livestock pumped with growth hormones and fed slaughterhouse-waste, Chicken McNuggets – nobody’s ever eaten this stuff before.***

New sustainable products of note include:

- Sustainable beer and wine purchases have increased substantially with the purchase of local and regional products such as Mojave Beers in Death Valley, Oregon beer and wine at Crater Lake, regional brews at Yellowstone and signature, Utah-produced wines at Bryce and Zion, Ohio state wines at the Ohio State Park Resorts, and private-label South Dakota wines at Mount Rushmore.
- Our seafood program has continued to grow with the continued use of the Marine Stewardship Council’s logo on our menus where we feature certified sustainable wild seafood such as Alaska salmon.
- New local products are in abundance including mesquite flour and Native American Greenthread tea in Arizona; Crater Lake Bleu Cheese from Rogue Creamery and lamb in Oregon; Ohio maple syrup; and whitefish, pork and lamb from Montana.

Xanterra also continues to purchase products such as:

- Montana Legend Beef (natural, no hormones)
- Sustainably-raised Niman Ranch pork
- Organic, shade-grown Fair Trade Green Mountain Coffee Roasters coffee
- Silk organic soy milk
- Oregon Country Natural Beef
- Snake River Farms Kurobuta Pork and Kobe-style beef
- Organic and sustainably-produced wines; one-third of the wine list at the Grand Canyon Lodge is comprised of wines produced using sustainable agriculture or organic farming techniques
- New Belgium Brewing beers produced with 100 percent wind power
- Organic produce
- Farm-raised tilapia, shrimp, trout, bison, elk and venison
- Abalone produced by Abalone Farm, a California facility that uses state-of-the-art sustainable practices that grow abalone without harming resources

***We’ve become a nation of guinea pigs, the subjects in a vast scientific experiment, waiting to see what happens when humans eat too much industrialized food.”***

***Eric Slosser, author, Fast Food Nation  
– as written in the forward to the book Grub: Ideas for an Urban Organic Kitchen, Anna Lappe and Bryant Terry, 2006.***



# COMMUNICATION and Education

Complying with regulations and instituting environmental management programs can only move a company so far toward sustainability. Xanterra believes that each of its more than 8,500 employees and millions of guests needs to participate in this culture of environmental protection for programs to succeed. Xanterra reaches out to guests and employees to encourage them to become part of the solution.

## ECOLOGIX VIDEO

The company's Ecologix environmental video is used to help recruit employees who share the company's environmental ethic, and who will work with Xanterra to make the environment a top priority, no matter the staff member's role. This eight-minute video, shown during recruitment and orientation, communicates Xanterra's environmental vision, goals and initiatives. It shows that protecting the environment is not just something the company does — it's central to its corporate identity.

## INTERNAL COMMUNICATION

Once on the job, Xanterra continues to communicate with and encourage employees to participate in on-going environmental programs. The company-wide Ecologix Green Letter newsletter, along with a quarterly corporate employee newsletter and property-specific newsletters, all highlight environmental initiatives.

## ECOLOGIX AWARD

Launched in 2002, the Xanterra Ecologix Award for Superior Environmental Performance is presented annually to one Xanterra operation (property) in recognition of environmental practices that go beyond compliance and make outstanding contributions to the environment. In 2005, Xanterra's Zion Lodge operation was recognized as the winner for numerous initiatives (see Case Study in earlier section for details).

## GUEST EDUCATION

By raising the awareness of guests, Xanterra allows them to join their hosts in helping to protect the environment. Interpretive signage may be an effective way to communicate with guests, but the company chooses to reach further.

Each Xanterra property involves guests in different ways, including:

- Guest service directories highlight topics including recycling and water conservation.
- A green-housekeeping program allows guests to help save water by reusing linens and towels.
- Xanterra's merchandise bags educate guests about recycling and ask them to do their part.
- Restaurant table tents give dining guests a chance to read about what Xanterra is doing to protect national and state parks, and many of Xanterra's menus explain sustainable cuisine choices.
- Room key cards ask guests to help save energy and water.
- Display cases in high traffic areas highlight ongoing environmental programs as well as results and identifies ways guests can contribute.



In 2006, we began conducting research and due diligence to create a more formal social responsibility program. As a starting point to that program, we have developed and analyzed a list of “indicators of social responsibility.” These indicators were culled from the Global Reporting Initiative’s (GRI) indicators that we felt were pertinent to Xanterra.

The indicators currently have been categorized as:

- 1) Workforce conditions, including indicators such as employee benefits, training, diversity, and safety;
- 2) Community involvement, including indicators such as partnerships and volunteer hours;
- 3) Ethical sourcing, including indicators such as regional/American sourcing statistics, supplier accountability and ethics, and environmentally preferable procurement; and
- 4) Environmental sustainability, which includes everything in this report.

In late 2007 and 2008, Xanterra plans to gather data on these indicators as a foundation for creating a direction for a social responsibility program.

## **SUPPORTING ADVOCACY GROUPS TO PROTECT PARKS**

In 2006, we sought out a partnership to further our efforts in national park protection. A natural fit came in the form of the National Parks Conservation Association (NPCA). NPCA’s only goal is to protect and enhance the ecological systems of

national parks. With Xanterra’s similar mission, we decided the best way we could support NPCA’s efforts was to sponsor their annual fundraising event. Along the way, Xanterra donated and helped raise more than \$175,000.

The event drew more than 600 guests, including Senators and Congressmen and National Park Service officials. The theme of the Washington, D.C. event was “Salute to the Parks: Protecting America’s Heritage.” The dinner honored U.S. Senator Dianne Feinstein for her ongoing support of our national parks and Pulitzer Prize-winning author Dr. James McPherson for helping renew interest in historic Civil War sites.

We also intend to host the 2008 NPCA event this Spring.

During the last six years, Xanterra has collected more than \$1.5 million to help the National Park Foundation as well as specific park foundations through a voluntary donation program of \$1 per room night from guests and from sales of National Park Passes. The funds help the foundation support projects and programs in the park where the donation is made. Guests of the lodges have the option of not participating, or they may also make additional voluntary donations.

Xanterra also teamed with the Peregrine Fund and National Park Service to sell shirts to raise money for condor protection at the Grand Canyon. In the Spring of 2003, their efforts paid off; rangers spotted the first condor chick to fledge at the park in a century.



## SOURCING AMERICAN MADE PRODUCTS

We always try to source products made in the U.S. for our gift shops, with a particular focus on regional sourcing. Our mission to provide memorable products for our guests now includes our “Made in the USA” campaign on retail merchandise. In addition, our buyers work with local craftsmen in each location, as is evident in the very high percentage of sales derived from Native American Handcrafts.

We also sell more environmentally preferable products than ever before – from apparel made of recycled fibers and gifts and jewelry made of recycled glass and copper, to “green” health and beauty aids offered in our camper stores. Where the industry has decided to make these items available, practical, and marketable, we have presented them to our guests. When our guests have shown that they are interested in buying such products, we have sourced more “green” products accordingly.

For example, for several years organically grown cotton T-shirts have been sold sparingly due to prohibitive prices, substandard quality, and limited colors. Today, Xanterra is able to procure a high quality T-shirt at advantageous pricing. Currently, Xanterra does not have the resources to

actually monitor how that cotton is grown or certify that it meets organic standards. However, we do ensure that we only do business with credible suppliers whose reputations for honesty and integrity are well known.

For the last six years Xanterra has contacted vendors and suppliers on an annual basis to inquire about environmental practices. We have found most to be more than willing to assist in our mission. We currently request that all of our suppliers and vendors cut down on packaging. We have even worked with suppliers to devise new ways to package and ship products to our stores and coordinate take-back programs for shipping packaging. In addition, contractors and vendors doing business with Xanterra must ensure that all waste is disposed of responsibly.

In the future, Xanterra will attempt to better scrutinize suppliers and vendors. We are still defining what criteria are most important to us and establishing a timeline to reach an attainable goal for implementation. In 2008, we plan to develop an ethical sourcing questionnaire to give to our suppliers. This will give us a better understanding of which suppliers will cooperate with our efforts.



## Case Study: VOLUNTEERS CREATE COMMUNITY AT THE GRAND CANYON

While Xanterra South Rim employees are required to live in housing within the national park boundaries, most of them consider it one of the benefits of their jobs. Many also realize that with the beautiful scenery comes the responsibilities of protecting the natural environment and supporting the community in which they live. With a resident population that ranges from 2,500 to 3,500, the South Rim of Grand Canyon National Park fits the definition of a small town. To that end, Xanterra’s South Rim employee Green Team implemented an

Ecologix Service Award program to encourage employees to volunteer for environmentally-related projects. This program continues to shine with more than 200 employees and their families logging almost 3,000 hours of volunteer work since 2004. Over 1,800 hours have been spent picking up litter both on the rim and in the canyon. Many hours have also been spent assisting local non-profit associations with projects such as condor nest watching, invasive species removal, and forest canopy surveys.



# PARTNERSHIPS

Through ongoing, evolving partnerships with external and internal stakeholders, Xanterra is better able to serve guests while protecting its properties' natural surroundings. Active alliances with the stakeholders listed below help Xanterra move closer to realizing its goal of sustainability.

National Park Service

Department of the Interior

National Parks Conservation Association

World Wildlife Fund

Center for Energy and Climate Solutions

Ohio Department of Natural Resources

Florida Department of Environmental Quality

Ohio Department of Environmental Quality

U.S. Green Building Council

EPA Energy Star Program

EPA Waste Wise Program

EPA National Environmental Performance Track

EPA Green Power Partner

Florida Department of Environmental Quality Clean Marina Program

National Park Foundation

Friends of Yellowstone

Greater Yellowstone Tetons Clean Cities Coalition

Yellowstone Business Partnership

Utah Power Blue Sky Wind Power

Pacificorp Wind and Geothermal Power

Renewable Northwest Project

Northwest Energy Coalition

Earth Share

Ecopartners

Colorado, Utah, Arizona Coalition of Clean Energy Technologies

Marine Stewardship Council

Chef's Collaborative

Seafood Watch

Native Energy

American Wind

Renewable Choice Energy

Arizona Climate Change Advisory Group

Tusayan-Grand Canyon Sustainable Energy Project Committee

Southern Utah Recycling Coalition

Jackson County Oregon Recycling



***“Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountain is going home; that wildness is necessity; that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life.”***

***John Muir***

# COMPLIANCE

The tourism industry is regulated by the same state and federal environmental laws that govern all companies, but as a park concessioner, Xanterra also complies with National Park Service and Department of the Interior policies. For Xanterra, environmental regulatory compliance is fundamental to all of our operations. Internally, we set rigorous regulatory procedures and standards to help each employee meet environmental regulations pertinent to a particular area of work.

To date, Xanterra has not received any environmental compliance penalties. However, in 2006, even though Xanterra was in compliance with major state and federal environmental laws, the company did receive one notice of violation from the Florida Department of Health for minor violations of the UST rule at the Everglades National Park marina. These findings revolved around a malfunctioning automatic tank gauging system and improper storage of leak detection records. Xanterra promptly corrected these violations.

At Yellowstone, a tank leaked several hundred gallons of fuel oil onto soil during a fuel transfer. This leak was caused by a faulty valve, coupled with human error. A new in-situ remediation technology – ozone injection – has been installed and will be completed in less than one year. There was no damage to local water or ecosystem resources. New procedures governing fuel transfer now prevent this type of spill from recurring.

At Scotty's Castle in Death Valley, a defective sump and line detection system on an above ground tank resulted in several gallons of gasoline leaking onto soil. This site is currently being characterized and will be remediated to the extent necessary.

Xanterra is still working with the Arizona Department of Environmental Quality (ADEQ) on a remediation plan for contamination caused by leaking USTs located at the Petrified Forest service station. The tanks that leaked were removed and replaced many years ago. In June 2005, ADEQ determined that the full extent and degree of the contamination had been adequately characterized by Xanterra. However, soil and groundwater hydrocarbon contaminants still exceed allowable levels. While ADEQ requires continued monitoring of the site, Xanterra plans to develop a remediation plan. Drinking water sources are not threatened by the contamination, which is static and stabilized in scope.

This report does not address federal or state OSHA safety compliance.

Compliance 2000-2007	Number of Penalties
Clean Air Act	0
Clean Water Act	0
Resource Conservation and Recovery Act	0
CERCLA (Superfund)	0
Toxic Substances Control Act	0
Safe Drinking Water Act	0
Superfund Amendments and Reauthorization Act (SARA Title III)	0
Department of Transportation	0
State Water/UST Regulations	0
State Air Regulations	0
State Hazardous /Solid Waste Regulations	0
Wastewater Exceedances	0

## NATIONAL PARK SERVICE CONCESSIONS ENVIRONMENTAL AUDIT PROGRAM

In 2000, the National Park Service launched its Concessions Environmental Audit Program. The purpose of this program is to conduct environmental compliance audits at all national park concession operations every few years. Since 2001, all 11 of Xanterra's national park operations have been audited under this program. To date, the company has had no Priority 1 compliance violations and only a handful of minor Priority 2 findings per operation on average. These audits have proven extremely valuable to Xanterra in assisting the company to embrace a high environmental standard.



# LETTER from the Vice President of Environmental Affairs

## THE EVOLUTION OF NEW SPECIES

I've loved nature since I was a small child. Unfortunately, back then, "loving" nature meant shooting anything that moved with my BB gun so that I could examine it up close. Sadly, whether boating, motorcycling, or hunting, "loving" nature included using, trampling, and destroying it. That was the culture of my rural south childhood.

Since those early years I've personally evolved to realize that nature requires constant protection. I view my career as a corporate environmental manager as my lifelong penance for the environmental sins of my past.

Large companies, which now comprise fully 50 percent of the top 100 economic entities on the planet, are currently going through a similar evolution.

Back in the 60s, businesses dumped toxic waste into the air and water without concern for its impact on ecosystems and people. Refrigerants that deplete the ozone layer were discarded into our fragile atmosphere. Lead, a neurotoxin, was used in all paint and gasoline; carcinogenic asbestos was in every building; nearly all underground fuel tanks leaked; most electricity was generated from burning dirty coal; no one recycled; and the concept of operational efficiency was nonexistent. There were no corporate environmental staffs other than health and safety compliance officers that kept the largest of companies from receiving fines and going to jail. A renowned TV commercial in the US was of a Native American, with a tear coming down his face, canoeing in a river past floating heaps of garbage.

But in the last decade, a new "species" of company has evolved and vigorously set out to make up for the "environmental sins" of the past. Now, almost every major company in the US employs environmental affairs departments to handle not only regulatory compliance, but also environmental sustainability issues. These issues are being discussed in corporate board rooms. Corporate environmental performance is being examined, and stocks rated, by Wall Street through sustainability indices. Today's workforce includes graduates with MBA degrees in environmental economics. The business world is almost united in its belief that reducing pollution and greenhouse gas emissions can go hand-in-hand with increased productivity and profits. Environmental issues are reported on regularly in Time, Newsweek, BusinessWeek, the Economist, and most business publications. And finally, after years of an activist malaise, there is a new grass-roots voice from consumers responding vehemently to irresponsible corporate environmental behavior.

So here we stand somewhere between the mistakes of our past and the promises of a better future. Within this vast range, I've seen three dramatic evolutions in the environmental movement in recent years:

- 1) Explosive growth in the sustainable design and construction of buildings;
- 2) Rapid awareness of the benefits of sustainable food; and
- 3) Consensus that climate change must be addressed by businesses, governments and citizens alike through reduction of greenhouse gas emissions.

Xanterra has tried to lead the way by implementing several major projects: two new LEED certified sustainable buildings; sustainable "green suites" at Zion, an ISO 14001 certified environmental management system integrating environmental management into literally every position in the company; a 51 percent solid waste diversion rate; on-site grease recycling into biodiesel; a companywide sustainable cuisine program; and our biggest environmental project to date – the one megawatt solar photovoltaic system at Death Valley – which will reduce our greenhouse gas emissions by an amount equivalent to the emissions of a small city.

Xanterra has also seized opportunities to implement numerous small changes in our operations: fishing lures made from tungsten, keeping lead out of riparian ecosystems; packaging materials reused instead of dumped in the trash; T-shirts made from organic or recycled cotton; alternative fuel and hybrid vehicles to replace gasoline vehicles in our fleet; bulk dispensing of bathroom amenities; and recycling camper propane bottles.

These are all signs of our evolution as a company. Like my irresponsible childhood eco-acts, business is changing the way it operates. For Xanterra, this eco-evolution defines our culture and our identity.

We hope the evolution is contagious.



Chris Lane  
Vice President, Environmental Affairs





# AWARDS, HONORS and Certifications

2007

## **National Park Service**

Environmental Achievement Award Winner, Crater Lake National Park, LEED-Silver certified sustainable design and construction of Annie Creek Restaurant

## **Environmental Protection Agency**

Environmental Achievement Award, Yellowstone National Park

## **Audubon Cooperative Sanctuary System (ACSS)**

Certified Audubon Cooperative Sanctuary, Furnace Creek Golf Course, Death Valley

## **Arizona Department of Environmental Quality (ADEQ)**

Performance Track, Xanterra South Rim, L.L.C.

## **Napa County**

Napa County Green Awards, Silverado Resort

## **National Park Service**

Environmental Achievement Award Honorable Mention, Petrified Forest National Park, *Taking Waste Management to the Highest Level*, Xanterra Parks & Resorts.

## **National Park Service**

Environmental Achievement Award Honorable Mention, Xanterra South Rim, *Innovative Green Purchasing*, Xanterra Parks & Resorts

2006

## **Environmental Protection Agency**

National Environmental Performance Track Corporate Leader Award for Exceptional Environmental Performance, Xanterra Parks & Resorts

## **Environmental Protection Agency**

Green Purchasing Gold Achievement Award, WasteWise program, Xanterra South Rim

## **Department of Interior**

Environmental Achievement Award Winner, Yellowstone National Park and Concessioner Employees, Montana and Wyoming Departments of Environmental Quality, and Environmental Protection Agency, Region 8, Environmental Stewardship at Yellowstone National Park and the greater Yellowstone area

## **Department of Interior**

Environmental Achievement Award Honorable Mention, Zion National Park, Environmental Stewardship at Xanterra Zion Lodge

## **National Registry of Environmental Professionals (NREP)**

Environmental Health and Safety Management Systems, Infrastructure, and Training Award Winner, Xanterra Parks & Resorts

## **National Park Service**

Environmental Achievement Award Winner, Zion Lodge Environmental Programs, Xanterra Parks & Resorts at Zion National Park

## **Environmental Protection Agency**

Environmental Achievement Award, EPA Region 8, Yellowstone National Park

## **National Park Service**

Environmental Achievement Award Honorable Mention, Yellowstone National Park, NPS and Concessioner Team Efforts for Waste Reduction

2005

## **American Hotel and Lodging Association**

Stars of the Industry Award Winner, Good Earthkeeping Award for Energy, Waste, Sustainable Design and Water Conservation at Yellowstone National Park, Xanterra Parks & Resorts

## **Hospitality Sale and Marketing Association International**

Adrian Award for Green Marketing, Xanterra Parks & Resorts

## **National Park Service**

Environmental Achievement Award (First Place), Yellowstone National Park, LEED-Certified Sustainable Design of Housing

## **Hazardous Materials Management Association**

Environmental Excellence Award, On-site Camper Propane Bottle Recovery Unit at Yellowstone

## **Environmental Design and Construction Magazine**

Innovation in Design Award, Yellowstone LEED-Certified Housing

## **ColoradoBiz Magazine**

Top Company of the Year Award

2004

## **American Society of Travel Agents**

Environmental Achievement Award, Xanterra Parks & Resorts

## **Charter Institute of Environmental Health, Environment Agency, Great Britain**

International Green Apple Award, Xanterra Parks & Resorts, Company-wide Sustainability Efforts

## **Colorado Department of Public Health and Environment**

Environmental Achievement Award, Xanterra Parks & Resorts, Sustainability Reporting and Pollution Prevention



**State of Arizona**

Governor's Pride in Arizona Award, Xanterra South Rim (Grand Canyon), Recycling and Waste Management

**U.S. Department of the Interior**

Environmental Achievement Award, Yellowstone National Park, Environmental Performance in Energy Management

**U.S. Department of the Interior**

Environmental Achievement Award, Zion National Park, Environmental Performance in Environmental Management Systems

**Utah Department of Environmental Quality**

Outstanding Achievement in Pollution Prevention, Zion National Park, Outstanding Achievement in Pollution Prevention

**National Park Service**

Environmental Achievement Award (First Place), Grand Canyon South Rim, Waste Management and Recycling

**National Park Service**

Environmental Achievement Award (Honorable Mention), Zion National Park, Environmental Management System

**Travel Industry Association**

Odyssey Award for Environmental Performance (Finalist), Xanterra Parks & Resorts, Company-wide Environmental Programs

**Condé Nast Magazine**

Ecotourism Award (Honorable Mention), Xanterra South Rim

2003

**State of Arizona Governor's Tourism Award**

Arizona Preservation Award, Xanterra South Rim, Environmentally Sensitive Tourism

**National Park Service**

Environmental Achievement Award (Honorable Mention), Mount Rushmore National Memorial, Environmental Programs

2002

**U.S. Department of the Interior**

Environmental Achievement Award, Death Valley National Park, Xanterra Death Valley Sustainability Committee

**Environmental Protection Agency (Region 9)**

Superior Environmental Performance Award for Business, Grand Canyon South Rim, Energy, Water, Waste Prevention

**Environmental Protection Agency (Region 9)**

Superior Environmental Performance Award for Business, Death Valley, Energy, Water, Waste Prevention

**National Park Service**

Environmental Achievement Award (Honorable Mention), Yellowstone and Grand Canyon South Rim, Pollution Prevention

**State of New York**

Energy Smart Small Commercial Lighting Award, Gideon Putnam Resort and Spa, Energy Savings

2001

**Travel Industry Association**

Odyssey Award for Environmental Performance, Xanterra Parks & Resorts, Company-wide Pollution Prevention, Recycling, Environmentally Preferable Purchasing, Environmental Management Systems and Educational Outreach

**U.S. Department of the Interior**

Environmental Achievement Award, Mount Rushmore, Zion, Yellowstone, and Grand Canyon National Parks, Pollution Prevention, Energy Conservation and Waste Reduction

**Environmental Protection Magazine**

Facility of the Year (Honorable Mention), Grand Canyon South Rim

**PROPERTY ENVIRONMENTAL CERTIFICATIONS**

**US Green Building Council LEED Silver Certification**, Annie Creek Restaurant and Retail, Crater Lake National Park, Xanterra Parks & Resorts, 2006

**US Green Building Council Leadership in Energy and Environmental Design (LEED) Certification**, Yellowstone employee housing, Xanterra Parks & Resorts, 2004

**Audubon Cooperative Sanctuary System (ACSS)**, Certified Audubon Cooperative Sanctuary, Furnace Creek Golf Course, Death Valley, 2007

**Marine Stewardship Council Certification**, "Chain of Custody" certification for serving sustainable wild Alaskan salmon, 2003

**Clean Marina Certification**, Everglades National Park Marina, Florida Department of Environmental Quality, 2005

**Clean Marina Certification**, Maumee Bay State Park Marina, Ohio Department of Natural Resources, 2007

**Clean Marina Certification**, Geneva Marina Park, Ohio Department of Natural Resources, 2007

**Environmental Protection Agency**, National Environmental Performance Track, Xanterra Parks & Resorts at Zion National Park; Bryce Canyon National Park; Mount Rushmore National Memorial; Grand Canyon South Rim; Crater Lake National Park; and Death Valley National Park

**EPA Energy Star Partner**, Xanterra Parks & Resorts, 2003

**Green-e certified renewable energy credits**, Zion, Bryce, Crater Lake, Grand Canyon South Rim, and Yellowstone

**ISO 14001 EMS CERTIFICATIONS**

Mount Rushmore National Memorial, 2002

Zion National Park, 2003

Bryce Canyon National Park, 2003

Crater Lake National Park, 2004

Death Valley National Park 2004

(Furnace Creek Inn & Ranch, Stovepipe Wells, and Scotty's Castle)

South Rim of Grand Canyon National Park, 2004

Yellowstone National Park, 2004

Painted Desert National Park, 2004

Everglades National Park, 2005

(temporarily suspended due to hurricane damage)

Rocky Mountain National Park, 2007





“We strive to protect the  
**BEAUTIFUL PLACES ON EARTH®**  
 our national parks.”



6312 South Fiddlers Green Circle, Suite 600N  
 Greenwood Village, Colorado 80111

Voice: 303.600.3400 • Fax: 303.600.3600  
[www.xanterra.com](http://www.xanterra.com)

### NEW LEAF PAPER®

#### ENVIRONMENTAL BENEFITS STATEMENT *of using post-consumer waste fiber vs. virgin fiber*

Xanterra Parks & Resorts saved the following resources by using New Leaf Primavera Gloss, manufactured with electricity offset with Green-e® certified renewable energy certificates, 80% recycled fiber and 40% post-consumer waste, and processed chlorine free.

trees	water	energy	solid waste	greenhouse gases
104 fully grown	64,264 gallons	76 million Btu	5,158 pounds	13,421 pounds

Calculations based on research by Environmental Defense and other members of the Paper Task Force.

©2007 New Leaf Paper [www.newleafpaper.com](http://www.newleafpaper.com)

