

Two Big Questions *then...* Twelve Steps to a Green Science Center*

Developing a Greening Program is not for the faint of heart. From our own experience, along with advice from our friends in the Green Campus Movement, we have found that ***structural changes must be pursued in advance of developing successful greening programs***. The reason for this is because most new initiatives and projects impact many people and various departments throughout an organization. While enthusiastic staff members are very good at driving new ideas, new ideas are difficult to implement or sustain without support from the top. So before you begin pursuing a green lighting project, a waste reduction effort or a “no idling” program, help your organization address:

Two Big Questions

How will we involve leadership?

Who will oversee our greening program?

Engage Leadership

Developing a greening initiative involves staff time and expenses and it reflects your organization’s mission. The use of resources and its implications on the science center’s image requires input from the top and institution-wide decision-making in order to succeed. Start building a green program by developing the idea with some of your colleagues. Write a concept paper which explains the rationale for a green program – we want our science center to “walk the talk”, to save money, to reduce greenhouse gas emissions. And, describe possible projects (what, how, why, possible outcomes). Look to other science centers or colleges for sample programs or examples. Then request a meeting with your administrative team and board members.

Program Oversight

A greening program doesn’t work without advocates, shepherds and a workforce. With assistance from your organization’s leadership establish a Green Team. Decide how many people are on the team, what departments are represented, who chairs the team, the frequency of meetings and how you will go about establishing your first round of projects. One place to begin is to go through the ***Twelve Steps to a Green Science Center***. This exercise will help you: 1) inventory current efforts, 2) identify potential projects, 3) estimate costs, 4) prioritize projects and 5) establish timelines.

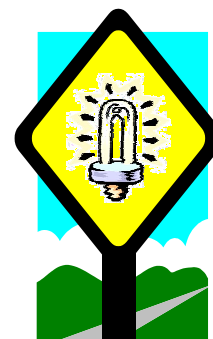
*Special thanks to the Institute for Sustainable Energy at Eastern Connecticut State University www.sustainenergy.org (developer of *Twelve Steps to a Sustainable High School*) For more information contact Laurel Kohl KOHLL@easternct.edu or 860-465-0256

Twelve Steps to a Green Science Center

1. Energy Conservation & Greenhouse Gas Emission Reductions

Energy budgets constitute a large portion of the operation costs of many science centers. Many new technologies can allow science centers to control and manage these costs and reduce greenhouse gas emissions.

- *Create databases that document energy use & cost*
- *Calculate your baseline greenhouse gas emissions*
- *Participate in your local utilities "energy audits"*
- *Look around the office, start by assessing how computers are used, what are "best practices" to reduce energy use and emissions*
- *Benchmark buildings against ENERGY STAR® standards*
- *Identify and complete energy conservation projects*
- *Promote programs to install "energy miser" power savers on science center vending machines*
- *Install or update energy management systems*



2. Energy Purchasing

Science centers are large-scale electric consumers and can minimize their environmental impact by implementing power saving technologies and utilizing renewable energy sources.



- *Structure energy purchases to enhance your conservation program*
- *Consider buying the science center's electric energy from a provider who uses renewable sources such as solar, wind, hydro and biofuel*
- *Use energy efficient measures and cost management technologies to flatten the campus load profile, improve the load factor and lower overall electric rates*
- *Enroll in "peak use" programs to reduce costs and realize rebates*
- *Phase out the use of high-emission fuels and transition to a power plan that includes renewable energy sources*

3. Training, Education and Outreach

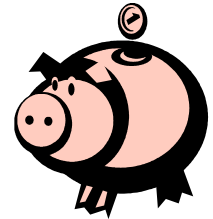
Through training, education and outreach science centers can prepare staff and visitors for a lifetime of sustainable living.

- *Prioritize environmental studies in your professional development program*
- *Teach energy and environmental literacy to all visitors*
- *Promote the linkage of energy conservation efforts to greenhouse gas emissions reductions. Identify how individuals can help reduce global warming*
- *Increase opportunities for using the science center physical plant and administrative operations as a "learning lab" for visitors – through specialized signage and "green tours" of the facility*

- *Develop community energy and environmental education programs, include families in curriculum exercises, and facilitate dialogue about energy and environmental issues at home and in the community*
- *Use science center websites and publications to keep your members informed*
- *Make a point of selling “green” items in your gift shop*
- *Develop press releases about your program and progress*
- *Go to donors and funders to underwrite some projects*

4. Purchasing and Administrative Services

Science centers are large-scale consumers and can use their buying power to encourage demand for environmentally responsible products.



- *Implement an environmentally-friendly products purchasing policy, i.e., buy only products that are durable, reusable, recyclable, made of recycled materials, non-hazardous, energy efficient, harvested in a sustainable manner, and produced using environmentally sound methods*
- *Investigate how your science center can utilize state contracting and purchasing to buy “green” products.*



5. Solid Waste Reduction and Recycling

Science centers generate large amounts of solid waste, which is disposed of in costly and environmentally irresponsible ways. By implementing a comprehensive recycling and waste reduction programs, science centers can minimize their waste stream.

- *Establish a waste reduction ethic in all areas by carrying out waste stream analyses that determine recycling potential*
- *Implement a recycling program that starts with paper and cardboard and expands to metal, plastic and glass*
- *Isolate and recycle tires, batteries, oil, electronics, and scrap metal*
- *Compost organic waste*
- *Isolate and recycle hazardous waste-containing products, such as fluorescent lamps and ballasts, anti-freeze, solvents, batteries, computer monitors, and TVs*
- *Establish programs recycling computer printer cartridges*
- *Seek to recycle at least 50% of science center waste stream*

6. Transportation

New technologies give science centers many options when addressing their transportation needs. They can reduce greenhouse gas emissions by reducing the number of bus trips on campus and by buying “green” vehicles when upgrading their vehicle fleet.

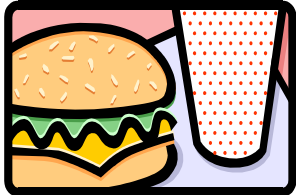


- *Encourage travel by carpooling, public transportation, bicycling, and walking*
- *Convert bus fleets to hybrid or alternative fuels such as natural gas, electric, or biodiesel*

- *Implement “no idling” programs in bus and car wait zones*

7. Food and Food Services

Science center visitors consume large quantities of food in cafeterias. Science centers should use healthy environmental practices when developing their food service plans.



- *Buy regional produce in season*
- *Support local organic farms*
- *Advocate the health and environmental benefits of less meat consumption and eating “low on the food chain”*
- *Promote healthy snacks in science center vending machines*
- *Minimize the use of disposable dinnerware*

8. Campus Grounds and Land Use

Many science centers have different science center campuses that encompass numerous acres and ecosystems. The concepts of sustainable development should be incorporated into campus designs to preserve and study these diverse ecosystems.



- *Redefine campus beauty*
- *Reduce lawn areas and grass cutting*
- *Promote “natural succession” for extraneous lawn areas*
- *Protect woodland, wetland, watershed, and wildlife areas*
- *Implement a tree protection policy*
- *Plant native species*

9. Water and Waste Water

Science centers consume large amounts of water on a daily basis. By adopting “green” practices, science centers can reduce their intake of water and outflow of pollutants.

- *Implement water conservation programs to repair leaks and replace or retrofit inefficient plumbing fixtures*
- *Protect ground water and storm run-off by minimizing use of salt for ice-melting*
- *Use drought-resistant plantings and minimize irrigation unless using captured rainwater*
- *Promote the use of the science center grounds as a learning laboratory for environmental and biology classes to investigate indigenous species and habitat patterns*



10. Hazardous Materials

Science centers produce and uses many toxic substances, and are obligated by governmental regulations to dispose of and handle these substances properly. By

implementing environmentally friendly products, science centers can reduce costs and limit environmental impact on and off campus.

- *Meet or exceed legal "haz mat" handling, collection, disposal and tracking requirements*
- *Educate campus hazardous waste generators about minimization and proper disposal techniques*
- *Develop a hazardous chemical tracking or inventory database*
- *Implement a "chemical swapping" program for classroom chemicals*
- *Switch to non/least toxic paints, solvents and cleaning agents*
- *In print shop, switch to soy-based inks*
- *Use integrated pest management techniques to minimize or eliminate use of pesticides*
- *Recycle and recover ozone-depleting CFCs*
- *Avoid chlorine-based products and incineration of plastics*

11. New Construction

Many science centers are frequently upgrading and expanding their facilities. They can save money and diminish their environmental impact by using new energy efficiency and waste management technologies during these upgrades.

- *Utilize sustainable or green design principles for all new construction and rehabs*
- *Strive for high performance standards such as Leadership in Energy and Environmental Design (LEED) or Collaborative for High Performance Design (CHPs) in new buildings*
- *Design for state-of-the-art energy efficiency and exceed energy codes*
- *Incorporate renewable energy technologies, including daylighting and passive solar*
- *Include a suitable recycling collection space in building design programs*
- *Specify environmentally friendly building materials and products*
- *Evaluate options based on life cycle analyses and building commissioning*

12. Campus Planning and Design

Science centers need to develop long-term plans that incorporate sustainable principles. By doing this they can save money and reduce environmental impact.

- *Develop science center master plans that minimize negative impacts and disruption of natural ecosystems and surroundings*
- *Preserve and enhance green spaces. Protect natural areas from development*
- *Concentrate buildings and arrange campus walkways and roads to minimize driving and create a campus that is convenient for pedestrians and bicycles*
- *Use water-efficient, indigenous plantings landscape for energy efficiency and aesthetics*

