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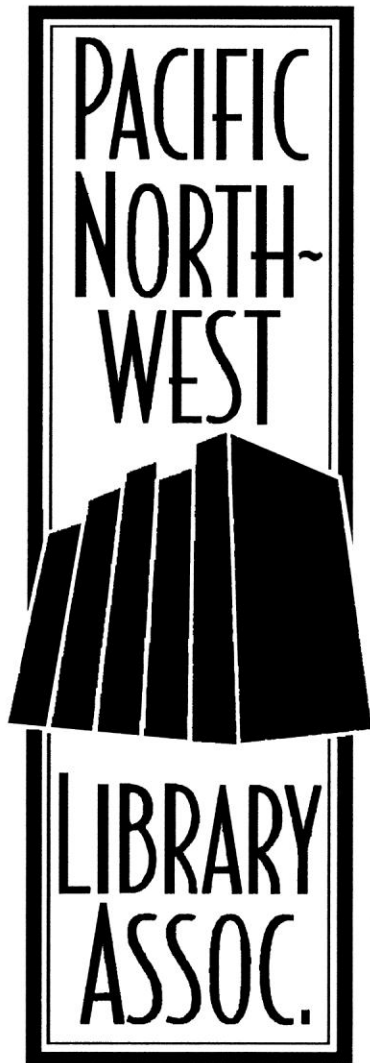
## Green Libraries on the Cheap

Sarah Fallik, Devin Soper and Kaitlyn Sparks



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**Call for submissions and instructions for authors**

Authors should include a 100-word biography and mailing address with their submissions. Submit  
feature articles of approximately 1,000-6,000 words on any topic in librarianship or a related field.  
Issue deadlines are October 1 (Fall), January 1 (Winter), April 1 (Spring), and July 1 (Summer).  
Please email submissions to [mbolin2@unl.edu](mailto:mbolin2@unl.edu) in rtf or doc format.

Library final thoughts: it is not right for every library, but it can be very right for your library. It's one of the things that really impresses assembly members, board members and members of the community. In this era of shrinking budgets, look to non-traditional partnerships and services to increase your service opportunities, programs, and relevance in the community.

## **Green Libraries on the Cheap**

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### **Introduction**

"Going green," or becoming more environmentally conscious, has become a mounting international concern in recent decades. The increasing global consumption of finite resources has led to large-scale societal campaigns to heighten awareness about environmental issues and concerns. With interest in environmental sustainability on the rise, libraries are increasingly deciding to undertake their own green initiatives. And why not? Libraries that embrace greener practices reinforce "their roles as community/cultural centers that significantly and positively impact the quality of life of those they serve" (Mulford & Himmel, 2010). Additionally, green library initiatives are a wonderful means of building community partnerships, demonstrating effective leadership, and enhancing the library's public profile (Brodie, 2012).

So what exactly does it mean to be a "green library"? The designation is difficult to define, but, generally speaking, libraries that implement green practices are committed to pursuing innovation, to minimizing waste, and, where possible, to adopting and promoting environmentally sound processes throughout their organizations (Schaper, 2010). While these aspirations are admirable, it is easy to lose sight of them, especially in times of

widespread economic hardship and dwindling library budgets. In light of these difficulties, the challenge of optimizing library facilities, operations, and collections can seem overwhelming, and the potential costs can be intimidating.

Contrary to these impressions, libraries can work toward a more sustainable future through relatively simple, inexpensive measures, and many changes can actually save money in the long term. This article outlines a variety of practical strategies for implementing greener practices within the context of budget limitations. Most of these strategies can be employed at minimal cost, and, taken together, they can serve as a powerful catalyst for change. Where there is a will, there is always a way, and getting creative is often the most effective way to stay within budget parameters!

## **Facilities**

Creating sustainable facilities is a critical (and often expensive) component of going green. A sustainable building "has a minimum adverse impact on the built and natural environment, its immediate surroundings, and the broader regional and global setting" (Weiner & Boyden, 2001). Increasingly, libraries are built with sustainability in mind, but creating greener facilities from existing buildings is also a viable option. Renovation is a form of recycling, which will have less of an impact on the natural environment than clearing a site and building a new library. The greening of existing library facilities is possible through a range of upgrades, many of which can provide a generous return on investment.

To start greening, the easiest and cheapest changes involve:

- Interior climate and lighting control
- Prevention of heat transfer through windows
- Water conservation through natural landscaping
- Replacement of outdated appliances

Proper management of the building's interior climate is a simple way libraries can save money in energy costs. Monitoring temperature, humidity, airflow, and energy consumption of major appliances will help determine the most efficient settings that maintain a comfortable climate for patrons and collections. When the library is closed, automatic settings to turnoff ventilation and setback temperatures are recommended and can be cheaply installed and programmed (Gisolfi, 2011).

Automatic lighting control is another means of utilizing technology to create greener facilities. Libraries can use light sensors to dim artificial lights when there is ample sunlight or turn on and brighten lights when the room grows dark. Besides reducing electrical use, such sensors will benefit the library by creating a well-lit environment, which will reduce eyestrain from too much or too little light. In large libraries, occupancy sensors are a practical idea since it is unnecessary to light vacant areas. This will reduce superfluous energy consumption.

In order to prevent heat transfer in warm months, the amount of direct light through windows should be limited. This will help curb reliance on cooling systems, which can be costly to run. Some options for limiting heat transfer through windows include planting deciduous trees to create shade, purchasing exterior sunshades or interior shades, and applying an exterior coating of glaze to windows (Gisolfi, 2011). If contemplating planting trees, remember that unless rainfall is sufficient, the use of ground water to maintain an

unnatural landscape is not considered sustainable practice. Therefore, when landscaping, phase out non-native plants and lawns and only replace with self-sustaining vegetation (Gisolfi, 2011).

Another simple green change is to replace old major appliances, including heating and cooling equipment (compressors, cooling towers, boilers). This will reduce energy costs, as older appliances require more energy than newer models (Gisolfi, 2011). Also, consider the money saved in repairs, which older equipment requires more frequently. In some situations, it may be necessary to wait for old appliances to be forcibly replaced until money is appropriated for the purchase of newer, more energy-efficient models.

When remodeling, making repairs, or replacing outdated equipment or fixtures, there are some notable green options to consider. In terms of electronics, consider using thin clients instead of personal computers when replacing public-access computers (Schaper, 2010). Thin clients require less energy and are cheaper than the average personal computer. They do not have all the capabilities of a personal computer, but for single functions such as a catalog search, they are a great alternative. Also, consider the purchase of energy efficient central processing units (CPUs). Besides lower electricity bills, both thin clients and newer CPUs will generate less heat than their alternatives, which is better for maintaining a stable interior climate (Schaper, 2010). In terms of repairs and renovations, consider adding more insulation to the roof when making repairs, as preventing heat transfer will lower heating and cooling costs. During more serious renovations, add insulation to the exterior walls as well, and consider buying triple glazed windows (Gisolfi, 2011).

There are some upgrades that are just too expensive for low budget green planning, but that could become possibilities with grants or monetary gifts. A popular trend is the creation of renewable energy, which is generated from natural resources with no emissions. So instead of just cutting energy consumption, many libraries are choosing to create their own with solar panels or windmills. If funding becomes available, harnessing renewable energy would be very beneficial for creating greener facilities.

For the most part, newer buildings are more commonly noted for their green construction and design. However, existing buildings can become Leadership in Energy and Environmental Design (LEED) certified for green operations and maintenance as well. This is an internationally recognized rating system that would give a library prestige and public acclaim. The LEED Checklist for Existing Buildings (<http://www.usgbc.org/ShowFile.aspx?DocumentID=8876>) may be useful for guidance when considering facilities and operational changes.

Why update library facilities to enhance sustainability and seek LEED certification? First, making greener facilities choices means taking responsibility for the library's environmental impact. Further, libraries are in a position to lead by example and become community leaders on the issue of environmental sustainability (Gisolfi, 2011). By showing leadership in green initiatives, libraries can serve patrons beyond the confines of the bricks-and-mortar institution.

## **Operations**

Library literature has begun to pay more attention to the exploration of green operational initiatives, and libraries are increasingly coming to understand the advantages of implementing environmentally sustainable policies and procedures.

The simple fact is that green libraries cost less to operate (Schaper, 2010). In day-to-day library operations, the little things can add up. There are many small practices that can easily be modified to incorporate green values, and these modifications can lead to positive change. Even small changes matter: apart from having the potential to reduce costs, they help to affirm a shift in values that can inspire further green initiatives.

Shifting to environmentally friendly cleaning products and materials is an easy, cost-effective means of commencing greener library operations. Brands that have fewer hazardous chemicals will have minimal, if any, extra cost. Cleaning products that contain a green seal certification mark on the bottle will contain the least harmful chemical agents (Miller, 2010). Libraries can even concoct their own very low cost, natural cleaners by mixing baking soda, lemon juice and water into a spray bottle. Odours can be expunged from carpets by sprinkling baking soda, letting it absorb for twenty minutes and then vacuuming (Miller, 2010). Investing in quality cleaning equipment, such as vacuum cleaners, is beneficial in the long run. Even if these products cost a little more initially, they are less likely to break, need to be replaced, and end up in landfills (Miller, 2010). Janitorial staff can be scheduled to begin cleaning at earlier hours, so that they complete their work just after closing time and thereby cut down on the library's after-hour electricity consumption (Schaper, 2010).

Lighting accounts for 30% of energy use in libraries (Miller, 2010). Aside from simply turning off lights when they are not needed, libraries can employ many strategies to cut down on lighting energy use. Compact fluorescent light (CFL) bulbs are energy efficient. Though more expensive, they use 75% less energy than conventional lighting, making them cost-effective purchases in the long run (Miller, 2010). LED light bulbs are also a great choice: they can reduce electricity consumption by 50-90%, and they have an impressive ten- to twenty-year life span (Schaper, 2010).

Printing and copying is another big area of waste in libraries. Paper, ink, toners, and machinery all have environmental impacts. The ideal solution, though perhaps not quite realistic at this point in time, would be to completely swap paper with electronic copies and messaging. Aside from this approach, libraries can move towards reducing their ink and paper consumption in several ways.

One strategy is to encourage patrons to download rather than print. For instance, academic libraries can teach patrons about free reference management software (such as Zotero and Mendeley), which store all your sources in a single online location so there is no need to print (Kruse, 2011). When printing is necessary, libraries can cut back on their paper use very simply by changing their printer settings to double-sided printing rather than single sided. There is also the option to switch to recycled paper, although, at present, this option can be slightly more expensive (Kruse, 2011).

A new option for sustainable ink is soy-based ink. Soy ink dries more slowly than conventional petroleum-based ink, but the environmental benefits outweigh this slight inefficiency (Kruse, 2011). Soy ink is lower in volatile organic compounds, making it the preferred choice for limiting air emissions and preserving clean air (Business.com, 2011). Further, soy ink simplifies the recycling process by making it less complicated and more cost-effective to de-ink paper that is to be recycled (Kruse, 2011).

General use of materials in the library can also be evaluated and improved. Eliminating plastic bags is an important step toward a greener library, and it comes with no additional

cost. If patrons are in need of a bag to carry checked-out materials, reusable bags can be made available for purchase. Waste produced by physical library cards can be reduced by making them from recycled materials, or by switching to a virtual check-out system (Schaper, 2010). Disposable plates, cups, and cutlery might be more convenient for office functions due to their quick clean-up time, but switching to reusable kitchenware will save garbage bags full of landfill items, and will also save money over time.

Remember, without the involvement and cooperation of library staff, the task of implementing and maintaining green practices will be difficult. Library management can take measures to encourage collaboration and brainstorming, and to keep staff motivated and excited about going green. It's quite easy to stir up enthusiasm for new ventures, but building and maintaining a lasting commitment will take genuine interest and great leadership. Measures to cultivate a green-minded staff can be as simple as establishing a green committee or using an environmental management system to track progress and provide positive feedback to boost morale.

## **Collections**

The environmental impact of library collections is a delicate topic, as collections are so central to the identity and purpose of most libraries. Nevertheless, both physical and digital collections inevitably contribute to a library's carbon footprint, and so it is important to include them in any responsible discussion of green library initiatives. The footprint of physical collections is perhaps the most obvious, as such collections are composed entirely of items that were produced and distributed at a direct cost to the environment. And, much as we might love them, printed works are especially bad culprits, as their production is inextricably tied to deforestation.

At the same time, physical collections also contribute to the library's carbon footprint by incurring a range of ongoing environmental costs, including all of the resources required to support "the processing, handling, storage, and management" of the physical collection (Chowdhury, 2012). Focusing just on storage, for instance, consider all of the energy required to keep an open-shelf area clean and well-lit, with a comfortable temperature and good air circulation, and to do so year after year, for the life of the collection!

As libraries continue to invest heavily in digital collections, researchers have begun to consider the environmental benefits of reducing the size of traditional physical collections and relying more heavily on their digital counterparts. More research is needed, but preliminary studies suggest that digital collections have a smaller carbon footprint than print collections, and that they become even more environmentally sustainable over time (Chowdhury, 2012). If digital collections are more sustainable, and if library patrons are not averse to the idea, then it stands to reason that libraries could reap significant environmental (and financial) rewards by reducing the size of their physical collections. Indeed, many libraries are already putting these ideas into practice.

At Macquarie University in Sydney, Australia, for instance, the librarians devote almost 80% of their collections budget to electronic resources, and, through the use of an automated storage and retrieval system (ASRS), they have reduced the floor space that would otherwise be required to house the physical collection by almost 40%—a reduction which they expect will save them 817 tonnes of greenhouse gas emissions each year (Brodie, 2012). These environmental savings will lead to considerable financial savings over time, and so, while installing and maintaining an ASRS is certainly expensive, it may well save the library money in the long run. Even discounting the ASRS, however, the example of



Macquarie helps to show that any reduction in the size of a library's physical collection can lead to significant environmental (and financial) benefits. (Of course, many libraries have good reason for relying heavily on their physical collections, and so decisions concerning the relative size of physical and digital collections will necessarily depend on the context.)

Digital collections also have a significant carbon footprint, due largely to the expensive IT infrastructure that is typically required to provide access to them. This infrastructure is comprised of computers and other devices that require a great deal of energy to create and still more energy to power and maintain, and that also frequently need to be replaced. In light of these environmental costs, what measures can libraries take to reduce the impact of their IT infrastructure?

Perhaps the simplest measure would be to make better use of freely available software solutions that can streamline workflows and minimize waste—innovations like online video-conferencing and collaborative, cloud-based software, as well as open-source software that can save the library money. Another option is to implement environmental management systems to optimize a library's IT infrastructure by minimizing excess downtime and other wasteful practices, as well as to monitor various other aspects of the library's everyday operations (Chowdhury, 2012). With regard to IT hardware, the adage about spending money to save money also seems apt: by purchasing hardware that is built to last, libraries spend more initially but save money over time.

There is also a strong argument for reducing the impact of IT by transitioning to a service model based on cloud computing (Chowdhury, 2012). Cloud computing essentially involves using online services that provide a certain amount of computer storage and processing power through the services themselves, and innovation which reduces the degree of IT infrastructure required for users to utilize the services. By moving to a service model based on cloud computing, the library could dispense with much of the expensive IT infrastructure that is traditionally required to host desktop-native software, as cloud-computing services include much of this infrastructure as a built-in component of their service.

In practical terms, this would mean a smaller IT department and reduced financial expenditure on hardware and software. Users need less powerful machines, and said machines rarely need to be updated. This also simplifies the process of collecting data about the library's resources and services, as cloud-computing services make it easy to view and analyse this data (Chowdhury, 2012). Indeed, while there are also various arguments against the cloud-computing service model (including concerns over privacy and the loss of control over library data), it may lead the way toward more environmentally sustainable library collections in the future.

## Summary

There are a variety of measures that libraries can take to reduce the environmental impact of library facilities, operations, and collections. Many of these measures are affordable even in the short term, while others may require a substantial expenditure in order to save money in the long run, but they all promise to benefit both the environment and the library's bottom line.

With regard to library **facilities**, managers may wish to consider the following practical recommendations:

- Adjust temperature and ventilation settings to decrease energy consumption, especially when the building is unoccupied.
- Install automatic light controls to adjust artificial lights for sunlight and occupancy.
- Use exterior and interior sunshades to reduce reliance on air conditioning.
- Replace major appliances and IT equipment with more reliable, energy-efficient models.
- Avoid lawns and revert landscaping to native vegetation.

Practical recommendations for more sustainable library **operations** include the following:

- Install CFL or LED light bulbs for more energy efficient lighting.
- Use environment-friendly cleaning products.
- Ensure that janitorial staff have reliable, energy-efficient equipment, and schedule them to complete most of their cleaning while the library is open.
- Reduce the impact of printing and copying by using the double-sided printer setting, purchasing more sustainable paper and ink, and relying more heavily on electronic documents and communications.

Finally, to move toward greener library **collections**, the following recommendations may prove helpful:

- Reduce the size of physical collections by relying more heavily on digital collections.
- Reduce the footprint of digital collections (and their requisite IT infrastructure) by seeking out more efficient hardware and software solutions.
- Monitor energy usage and minimize waste associated with maintaining and managing library collections.
- Make better use of cloud computing services, leveraging the IT infrastructure that these services vicariously provide in order to reduce the library's own IT footprint.

## Conclusion

As greenhouse gas emissions and global temperatures continue to rise, going green is becoming an increasingly important priority for libraries. By undertaking environmental initiatives, libraries can substantially reduce their carbon footprint, and thereby contribute to a healthier planet and a more sustainable future. Going green need not be expensive, and it promises to save libraries money in the long run. There are numerous affordable ways to improve the environmental profile of library facilities, operations, and collections, and even the more expensive options can prove economical over time. These savings can then be used to improve services, reinvest in further green initiatives, or address other pressing needs.

Sustainability initiatives also present libraries with a fantastic opportunity to become important community partners on environmental issues, partners that not only contribute to the educational push, but also lead by example—and thereby raise their profile within the broader community. Finally, going green can also improve staff morale by adopting an inclusive approach that promotes collaboration across the library. By setting goals and rewarding progress with positive feedback, libraries can cultivate a powerful sense of accomplishment that builds with each milestone. While environmental initiatives are first and foremost about respecting the planet, they can lead to a range of other rewards. With so much to gain, and with so many affordable ways to get started, there has never been a better time to go green!

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