

best practices

REPORT #9

Green Communities

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Community Associations Institute (CAI) and the Foundation for Community Association Research are dedicated to conducting research and serving as a clearinghouse for information on innovations and best practices in community association creation and management. As part of the Best Practices project, operations related to various function areas of community associations—including community harmony & spirit, financial operations, governance, reserve studies/management, strategic planning, energy efficiency, transition, and community security—are available at www.cairf.org as free downloads and are for sale in CAI's bookstore.

What are Best Practices?

The Foundation is pleased to offer function-specific Best Practices Reports in the community association industry. The Foundation has developed best practices in select topic areas using a variety of sources, including, but not limited to, recommendations from industry experts and various industry-related publications. The outcomes of the Best Practices project include:

- Documented criteria for function-specific best practices.
- Case studies of community associations that have demonstrated success.
- Development of a showcase on community excellence.

The benefits of benchmarking and developing best practices include: improving quality; setting high performance targets; helping overcome the disbelief that stretched goals are possible; strengthening cost positions; developing innovative approaches to operating and managing practices; accelerating culture change by making an organization look outward rather than focusing inward; and bringing accountability to the organization because it is an ongoing process for measuring performance and ensuring improvement relative to the leaders in the field.

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Introduction

Naturalist John Muir fell in love with the glens of Yosemite more than 100 years ago, declaring, "In God's wildness lives the hope of the world."¹ We appreciate the comforts of HVAC (heating, ventilating, and air conditioning) and the amenities of civilization but also want a better, greener world. We are working toward such a world. By the first decade of this century, Americans will have shopped in environmentally friendly ways in record numbers.² We recycled more, even assuring that we recycled our relatives in burial in an eco-friendly way.³ Some of us earned college degrees in sustainability and eco-sensitive design. And we formed cooperatives and purchased homes in planned communities that are environmentally attuned to our shade-of-green preferences.

This report explores "greenness" in communities, in their varied forms. It considers the concept of sustainability through better designs, new technologies and social innovations. Sustainable communities are developed to meet the "needs of the present without compromising the ability of future generations to meet their own needs."⁴ They are regenerative, meaning they have "processes that restore, renew or revitalize their own sources of energy and materials, creating sustainable systems that integrate the needs of society with the integrity of nature."⁵

As community managers and association leaders, we hold in the back of our minds the question: Can we improve the world for future generations? Sustainability is, in a general sense, the capacity to maintain a certain process or state indefinitely. In recent years, the concept has been applied to humanity, expressed as meeting the needs of the present population without compromising the ability of future generations to meet their own needs.⁶ Can we set sustainability goals? Can we measure how well we are achieving them?⁷ And can we produce a feedback loop to observe, communicate and celebrate our successes? This report seeks to answer some of those questions.

The credo for sustainability is, "Think globally, act locally."⁸ Consider this common-sense caveat: that each community's resource savings, its greenness or its sustainability planning and acceptance should not come at the expense of the residents. What is accepted as the right behavior in one community should not be dictated as required for all. In this report we will explore the countless ideas and resources that professional managers and community leaders can use to help their association "go green."

A green community should do the following:

- Pick up litter.
- Recycle and reuse (waste diversion vs. waste disposal).
- Save water, store water, catch rainwater.
- Maintain energy efficient buildings, either retrofitting existing or building anew.
- Manage land and lakes for environmental preservation and conservation.
- Make its membership aware of green products and services available to them.
- Use energy efficient transportation.

SECTION 1

Defining Green

Community association developers and leaders are increasingly embracing green thinking and design. Initially, this was monetary-driven happenstance rather than green-driven planning.⁹ In the 1960s, large-scale, master-planned communities such as Reston, Va.; Irvine, Calif.; and Columbia, Md. emerged with design focused on land preservation.¹⁰

Reston developer Robert Simon hired Conklin Rossant Architects as master planners to incorporate higher-density housing so open space could be available, conserved and managed. He persuaded the Fairfax County Board of Supervisors to pass an ordinance making possible the clustering of housing closely together so that open space with fields and trees could serve as large areas of commonly held land to improve the physical appearance and the environmental quality of the community.¹¹ This same grass roots approach of community groups influencing government occurred in Latin America in the 1990s.¹²

Similarly, when the University of California asked The Irvine Company for 1,000 acres for a new campus in 1959, the company agreed. California accepted the land and purchased an additional 500 acres. The university's consulting architect, William Pereira, and Irvine Company planners drew up master plans for a city of 50,000 people surrounding the university. Planning included industrial zones, residential and recreational areas, commercial centers and greenbelts.^{13 14}

Columbia, Maryland was formed with the goal of creating "a garden for the growing of people."¹⁵ Green as a concept did not arrive in the common consciousness until the 1970s with the first Earth Day celebrations. CAI recommended that managers consider this for their communities in the mid-1980s. Clearly, communities were green in land planning and resource usage long before green was an accepted concept.

Nevertheless, the core purposes of community associations create some sustainable practices and approaches, even in communities without green language in their covenants. Planned communities exist to improve members' quality of life,^{16 17} because they offer choices, lifestyles, amenities and, most importantly, efficiencies that people value.¹⁸ Architects, landscape architects and developers initially conceived planned communities as places where many community members could share resources, thereby saving each member the cost of building resources themselves.

Out of the community association concept came the sustainable idea of saving energy and resources. Developers have found that they enjoy a competitive advantage by constructing new communities with common recreational amenities and provision of some services. These forms of development require some type of homeowners association to manage the common amenities and deal with maintenance and service issues.¹⁹ For example, instead of 100 association members having 100 private backyard swimming pools, the association builds a single common pool to provide economies of scale, both in maintenance and replacement costs and resources used.

The core values of a community association lead to sustainability, too. For example, care and respect for neighbors are integral to planned communities,²⁰ as are values such

as a community's aesthetics and its environmental quality. This leads to green practices such as ensuring a proper appreciation, valuation and restoration of the natural surroundings of the community and the environment, even in an urban setting. Some urban communities are creating green rooftops to improve members' quality of life. For example, in Kansas City, Mo.,²¹ green roofs slow down rain runoff into existing overtaxed storm water sewer infrastructure. Consequently, the Kansas City municipal government wants more of them.²²

Additionally, core values facilitate community-wide participation in sustainable practices such as recycling and community litter pickup. In some cases, communities receive reimbursements from state and local governments for their community litter pickup programs.²³

Core values further lead to an insistence on sound community governance on environmental policies and rules that foster community spirit and unity. Cohousing, a concept that arose in Denmark more than 30 years ago and came to the U.S. in 1991 with the completion of the first multi-generational neighborhood in Davis, Calif., does this by letting the community establish its own rules.

In this arrangement, homes cluster around a pedestrian street or green with the common house as a focal point. The common house typically features a kitchen, lounge with a television, guest rooms and laundry.²⁴ Such pooled resources are ecologically smart. For example, the availability of guestrooms permits individual members to have smaller homes with no loss of comfort.

With cars typically parked on the periphery, the neighborhood becomes pedestrian friendly. Cohousing also typically encourages play areas, sports fields and daycare. Landscape maintenance equipment is shared among the group. The community does some bulk purchasing of food, and several communal meals per week save energy for all.

Good governance considers restrictive covenants, including eco-friendly practices. Guidance on solar panels may be a matter of community preference. Similarly, some communities see clotheslines as aesthetically pleasing as flowering fields, while others do not.²⁵ Communities will create the rules that fit the vision and mission of that association.²⁶ ²⁷ That said, more and more state legislatures have passed laws superseding governing documents that prohibit both solar panels and clotheslines.

New Urbanism takes a different approach from cohousing. Arising in the 1980s in the U.S., it was a pushback against suburban sprawl. Through planning and design, New Urbanism communities are designed to contain diverse jobs and to be as walkable as cohousing. However, they do not provide cohousing's communal aspects of day-to-day living. The most renowned example of New Urbanism is Disney's Celebration in Florida. Another noteworthy example is Kentlands in Gaithersburg, Maryland.²⁸

A planned community empowers its association members to foster and encourage green ideas appropriate for it. It respects neighborhood preferences and is active in allowing for diversity, including the neighborhood's natural environment biodiversity. This may yield phenomenal results, such as allowing hawks to return to nests on Fifth Avenue in New York City to raise their young²⁹ ³⁰ or even allowing songbirds to return to Versailles.³¹

Why Go Green?

Association leaders should do what works for the community, not what green planners dictate. What designers plan, even with the best of intentions, is not necessarily what association members or employees will hold dear. For example, residents in desert areas like Phoenix generally prefer relatively water-intensive plantings, including turf grass (sod), around their homes even though they claim they find desert landscapes appealing.³² The resulting irrigation accounts for more than two times the national average of gallons of water per day.

Remember, little changes help quite a bit. Even on small things, such as the meetings you hold, you can be greener for your community.^{33 34} Consider these possibilities:

- If you are renting a space, ask meeting facility managers what they can do to help you reuse, recycle and reduce for your meeting.
- Use china and glass for food service instead of disposable items.
- Buy recycled paper for invitations, posters and paper supplies.
- Supply pitchers of fresh ice water instead of bottles of water.
- If you have food service, ask for bio-compostable plates and utensils.

Identify and use local and organic food and beverage suppliers. Pick meeting locations located on mass transit routes and publicize and encourage the use of mass transportation to attend the function.

Source products that are reusable (name tags, binders, grease boards), made from recycled content, use little or no packaging or packaging that contains recycled or reused materials and are recyclable or compostable on site or in community programs.

Donate food leftovers to food rescue programs in the community.

The Value of Green to Your Community

Do not underestimate the financial benefits of going green. The State of California’s 2003 report on building green indicated that minimal increases in upfront costs of about 2 percent to support green design would, on average, result in lifecycle savings of 20 percent of total construction costs—more than 10 times the initial investment.³⁵ (A “green building” is defined as one designed or modified to conserve resources and reduce negative impacts on the environment, whether it is energy, water, building materials or land.³⁶) A report to the American Institute of Architects showed building green schools costs \$3 per square foot more but saves \$71 per square foot.³⁷

Figures below represent ranges for all U.S. regions, based on a 2,000 square foot unit. Actual results will vary depending on local climate, age and condition of your unit, energy costs and lifestyle.

Action	Cost	Savings	Payback
Energy Star™ programmable thermostat	\$115	\$15 to \$200 per year	Less than 1 year
Heating & cooling system tune-up	\$191	\$115 to \$140 per year	9 months to 1.5 years
Professional air leak sealing	\$550	\$215 to \$400 per year	At least 2 years
Professional duct sealing	\$450	\$225 to \$370 per year	At least 2 years

You may also realize significant savings by going green in vehicle use. Keeping tires properly inflated saves about 10 cents per gallon, while extending the tires' life. Replace dirty air filters on vehicles and improve gas mileage by up to 10 percent.³⁸

While each vehicle reaches its optimal fuel economy at a different speed (or range of speeds), gas mileage usually decreases rapidly at speeds above 60 mph. You can assume that each 5 mph you drive over 60 mph is like paying an additional 30 cents per gallon for gas. Aggressive driving (speeding, rapid acceleration and braking) wastes gas. It can lower your gas mileage by 33 percent at highway speeds and by 5 percent around town.³⁹

When buying a fuel-efficient vehicle, your choice of transmission will directly affect the cost of the vehicle and its fuel consumption. Generally, a manual transmission is more fuel efficient than an automatic, assuming you shift properly. If you buy an automatic, the more gears, the better.⁴⁰

Yet another way to gain financial benefits is through plantings. Replacing lawns with native shrubs and trees reduces the need for watering, mowing and lawn chemicals.⁴¹ Xeriscaping, defined as landscaping that reduces or eliminates the need for irrigation, can yield substantial savings.⁴²

The Million Trees Los Angeles initiative researched the benefits of planting a million new trees between 2006 and 2010. Numerical models were used with geographic data and tree size information for coastal and inland climate zones to calculate annual benefits and their monetary value. Benefits for the one million-tree planting for the 35-year study period (2006-2040) were between \$1.33 billion and \$1.95 billion. Average annual benefits were \$38 and \$56 per tree planted.⁴³

Going green also yields profound health benefits. The nation's buildings account for 48 percent of the country's greenhouse gas emissions, including the annual energy required to operate residential commercial and industrial buildings along with the embodied energy of building materials such as carpet, tile, glass and concrete.⁴⁴ By 2010, U.S. buildings will emit 500 million metric tons of carbon dioxide.⁴⁵

Community volunteers and workers enjoy immediate health benefits when they are in a green building. On the other hand, some traditional buildings can adversely affect employee health. Managers can reduce absenteeism and abate health costs by creating green building workplaces with safe, healthy, comfortable indoor environments. Internal environmental quality determiners such as thermal, lighting (including daylight), ventilation (carbon dioxide rate), and air quality standards are predictors for such extremes as sick-building syndrome, allergies and asthma and short-term sick leave because of respiratory illness.⁴⁶ A study at Herman-Miller showed up to a seven percent increase in worker productivity following a move to a day-lit facility.⁴⁷ A study from Lawrence Berkeley National Laboratory found that U.S. businesses could save as much as \$56 billion through fewer sick days and an additional \$234 billion in worker performance through improvements to indoor air quality.⁴⁸ Corporations with green buildings improved employee health one to 20 percent,⁴⁹ which in turn improved productivity.

Another interesting fact is the shade from trees can reduce ambient air temperatures by five to eight degrees.^{50 51} However, trees require significant amounts of water, and deeply shaded forests do not retain as much carbon as previously thought. A single mature tree can absorb as much as 48 pound of carbon dioxide annually and release enough oxygen into the

atmosphere to support two human beings. It is estimated that between 660 and 990 million tons of carbon is stored in U.S. urban forests nationally.⁵² However, trees release carbon as they die, so by maintaining a healthy urban forest—prolonging the life of trees and continually increasing tree stock—communities can increase their net carbon storage over the long term. Large healthy trees (trunks greater than 30 inches in diameter) sequester 90 times more carbon annually than small trees (trunks less than 4 inches in diameter).⁵³

Positive evidence abounds. As of 1999 in Atlanta, tree cover saved residents an estimated \$15 million in pollution-control devices. In 1996 in Fort Worth, trees removed approximately 29 tons of ozone, 13 tons of sulfur dioxide, 17 tons of nitrogen dioxide, a small amount of carbon monoxide, and 592 tons of airborne particulates. In the Houston area, particulate pollution is responsible for an estimated 434 premature deaths each year.⁵⁴ Massive tree planting programs in Atlanta, Mexico City and Sacramento have reduced ozone accumulation.⁵⁵

Going green also boosts productivity. The tendency is to think in terms of raising the quota of widgets per hour on an assembly line. Although community associations are not factories, green concepts can yield energy savings while lowering air pollution. A city center using walking and cycling only uses one tenth of the energy of a city with gasoline-powered vehicles.⁵⁶

A study conducted by the Technical University of Denmark determined that in 83 percent of cases, recycling is the most efficient method to dispose of household waste.⁵⁷ Visit Pledge to Reduce Your Carbon Footprint online at www.worldoffset.org for more information.

In addition to financial and health benefits, going green offers aesthetic benefits. Green looks good, although green looks different. Seeing wildlife is appealing. Well-run communities—even in New York City—are where suburbia ends.

Green is cool. In 2007, Thomas L. Friedman, author and columnist for *The New York Times*, said that a very significant development was that living and thinking green had become mainstream, that it had become understood as patriotic and right. He said, "I want to rename 'green.' I want to rename it geostrategic, geoeconomic, capitalistic and patriotic. I want to do that because I think that living, working, designing, manufacturing and projecting America in a green way can be the basis of a new unifying political movement for the 21st century."⁵⁹

Green is, however, a different aesthetic. Instead of maintaining lawns that require significant irrigation and chemicals, allowing them to become forest areas over time will require courage and grit to let nature take its course.⁶⁰ For a lawn to grow into a meadow can take from two to five years,⁶¹ and from a meadow into a forest can be five to 25 years,⁶² assuming you are not planting it. A community's pond needs to remain unmowed in a swath at least 10-foot wide around the pond edge to significantly improve water quality;⁶³ ⁶⁴ however, a width of as little as three feet makes a big difference.⁶⁵ But, in either case, this is quite a different aesthetic from mowing to the water's edge.

Material	Energy Savings	Air Pollution Savings ⁵⁸
Aluminum	95%	95%
Cardboard	24%	—
Glass	5–30%	20%
Paper	40%	73%
Plastics	70%	—
Steel	60%	—

As areas become increasingly urban and suburban, people increasingly seek nature preserves, woodlands, urban forests and green buildings. Urban residents put a premium on neighboring open space.⁶⁶

Community Call to Action: Helping Community Leaders Be On Target

To assist your community, plan and establish a means for residents to realize their greener future. Unless the manager or board of directors understands green concepts and sees the value of them, your initiatives could well be minimized or discounted.

The community's board should first establish its green mission, such as: "We support locally made, organic or earth and human friendly products and practices that reflect our goal as a conservation-friendly, education-oriented community that does green things. For example, it:

- 1) picks up litter
- 2) recycles and reuses
- 3) saves or stores water
- 4) maintains energy efficient buildings
- 5) manages land and lakes for environmental preservation, conservation, and the benefit of wildlife
- 6) makes its membership aware of green products and services available to them
- 7) uses energy efficient transportation

This mission should not be stated unless there is an understanding that the community supports it. To that end, the board may want to add the following proviso: "We support these green goals to the extent that they are embraced by the community's members." Such wording would allow future boards the ability to embrace the mission even as they modify it to suit the community for that year.

Count on the green community in your location becoming very different over the next five years, since change is the nature of life. Characterize that situation in the mission by allowing for change and growth. Start with a very few things that you know you can tackle, then grow greener over time. It is better for your community to grow from a solid foundation than be a quick-to-rise soufflé.

Once you have a board-approved policy in place, the manager must implement the policy. Set up a representative from each community neighborhood, or building or cluster of homes, plus staff department reps to serve as a Green Initiative Leadership Council, or "Green Team." This accountability group will be responsible for meeting the mission. The Green Team becomes your closest confidante to help put into action the board's broad mission. Each rep must have excellent communication skills. Each rep would monitor and advise on community's interest in the team's green ideas, and consider tactics to fulfill the board's mission.

Pulling Together a Green Library and Resources

Expand your reach beyond the Green Team by providing videos, books, and a website for your community's members. Provide a virtual tour of your recycling center on your website. Post information on progress in your community newsletter. Print green-inspired materials, including a business or home recycling guide, household hazardous materials guide and variety of flyers about wildlife in your community, when and where they can be seen.

Post green tips in your community's newsletter such as an article about how much money drip irrigation saves vs. standard irrigation or one about how much money a non-leaking sink or toilet saves over a leaking one. Use CAI's website resource, www.caigreen.org.

A few grass roots actions will help guarantee continued green success.⁶⁷ Be sure that the board approves the strategy annually and has the opportunity to modify it. Don't let the mission ossify.

Make one person responsible for driving the board-approved strategy—is that you? That person should make a progress report to the board at least twice and detail new tactics initiated to dovetail into that year's strategic plan.

This person and the Green Team should coordinate the strategy implementation and ensure effective communication throughout organization. Strategies include:

- Develop indicators and baseline data to measure success.
- Use a Hot Spot List to target sites and activities.
- Develop positive relationships with community authorities to further the green cause.
- Develop positive and productive partnerships with key community businesses (whether they are strictly within your community boundaries or not, neighbors are neighbors).
- Use the expertise of the community's current vendors, including waste-management contractors and recycling contractors, who may have programs to offer.
- Provide a consistent, creative and comprehensive community education program.
- Help the community celebrate its successes.

Any community member can be encouraged to take a number of actions to be greener.⁶⁸ Here are a few tips.

- Reduce emissions in your home energy use (get better insulation, plant a tree on the west side of your home, consider green electricity, turn off your computer at night, turn off appliances).
- Reduce emissions in your transportation energy (buy a hybrid, use light rail, carpool, bicycle, walk).
- Buy the most energy efficient appliances (called Energy Star™ appliances by EPA) and other products.
- Be a green consumer (shop from local suppliers, farmers).
- Live a "carbon neutral" life.⁶⁹ Reduce, then offset the rest. To find out how, go to www.climatecrisis.net and use the carbon calculator.
- Make your home or business carbon neutral.
- Integrate climate solutions into all your innovations (try air drying clothes instead of conventional drying).
- Invest your money in sustainability companies, funds, places of worship and communities that are part of the solution.
- Become a catalyst of change in your community. Teach others only if you really believe it.
- Raise awareness by promoting green practices in your community.
- Become an active participant in your community. Speak up. Help. Contact your elected officials. Make our democracy work.

SECTION 2

Green Concepts and Sources You Can Use

This section outlines numerous green techniques and innovations that you can implement in your own community. These are:

- Litter Prevention and Cleanup
- Recycling: Waste Diversion vs. Waste Disposal
- Conserving Water, Saving Water, Storing Water, Catching Rainwater
- Energy-Efficient Building and Housing
- Development Innovations
- Energy and Power Innovations
- Building Materials Innovations
- Land and Lakes Management Innovations
- Green Product Availability to Community Members and Staff
- Energy Efficient Transportation
- Getting Help from Environmental Professionals
- Getting Community Recognition
- Win the Hearts of the Majority
- Seeing the Face of Your Green Community

Litter Prevention and Cleanup

As the oldest green activity, litter prevention and cleanup is quick and results are immediate whenever you want to kick-start a green community program.^{70 71} Keep America Beautiful, a national nonprofit public education organization with 565 certified community affiliates, offers assistance in every state. Its tools for communities include publications such as *Role of Recycling in Integrated Waste Management*, *Close the Loop: Buy Recycled* and web-based educational tools such as Clean Sweep USA at www.kab.org.

The Texas Department of Transportation initiated a particularly effective roadway pickup program called "Don't Mess with Texas" in 1986, removing hundreds of tons of trash from Texas roadways.⁷² While the program cut roadside litter by 52 percent by 2005, the work cost the state \$35 million annually. An additional \$2 million annually to promote this awareness campaign was offset by \$2 million in "Don't Mess with Texas" annual merchandise sales.⁷³ Your community's efforts need not involve such an outlay of cash; most community programs are voluntary-only programs that receive some monetary assistance from state and local governments.

Americans discard billions of cigarette butts each year, with a large percentage tossed directly into the environment. While cigarette filters look like cotton, they are cellulose acetate, a plastic material that degrades slowly. Consequently, nicotine and other tobacco residue leach into water supplies and turn up in the digestive tracts of birds and fish.^{74 75}

Develop strategies for fighting litter and disposing of cigarette butts. Start by analyzing the role of people who litter and when they do it, which products are involved most

often, and the nature of the places where litter accumulates or where it may be transported. Once you gather that information, you can paint a picture of the problems and raise public awareness within your community

Through communication, you can build involvement. Creatively coordinate community partners for a cleaner community. Remember to celebrate the community's successes, acknowledging what works well, milestones or special achievements.

Storm drains are for rain, but litter often ends up in storm water drainage systems as pollution in lakes, streams, rivers and oceans. For a good model for preventing storm-water pollution from discharge of car-care products, dog feces, fertilizers, paints, pesticides and even well-intentioned recycling, visit the County of Los Angeles Department of Public Works website at <http://dpw.lacounty.gov/epd/ea/stormwater/tips.cfm>.

Balloon mass-releases are illegal in several states, including Connecticut, Tennessee and Virginia, because they pose a serious ingestion and entanglement hazard to animals, especially marine animals. In an experiment in North Carolina, balloons floating in seawater deteriorated much slower than those exposed to air only, and even after 12 months of exposure retained their elasticity.⁷⁶ Among the North Atlantic animal species found with latex balloons in their digestive systems are common dolphin, loggerhead turtle, leatherback turtle and infant sperm whale.⁷⁷

Other commendable litter cleanup sites are Auntie Litter for Kids, www.auntielitter.org, and the West Virginia Dept of Transportation Litter Help and Adopt a Highway Program, www.wvdot.com/3_roadways/3c1_adopt.htm.

Recycling: Waste Diversion vs. Waste Disposal

Currently 20 percent of the municipal solid waste in the U.S. is recycled or composted. Nevertheless, every American discards, on average, four pounds of material daily. Clearly, more can be done to divert waste.

Produce less waste by means of the three R's⁷⁸: Reduce, Reuse and Recycle, covered well by the Environmental Protection Agency at www.epa.gov/garbage/reduce.htm, www.epa.gov/garbage/reuse.htm and www.epa.gov/garbage/recycle.htm.

Reduce. Reduce the amount and toxicity of trash you discard. Possibilities include purchasing durable, long-lasting goods, seeking products and packaging that are as toxin-free as possible and redesigning products to use fewer raw materials in production, last longer or can be used again after their original purpose.

The term "source reduction" refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become waste. Source reduction also refers to the reuse of products or materials, again so they do not become waste.⁷⁹

More than 6,000 communities have instituted EPA's "pay-as-you-throw" programs, where citizens pay for each can or bag of trash they set out for disposal rather than through the tax base or a flat fee. When these households reduce waste at the source, they dispose of less trash and pay lower trash bills. Currently, Washington state has the largest number of PAYT communities—522.⁸⁰

The Resource Conservation challenge is EPA's national effort to conserve natural resources and energy by managing materials more effectively. It allows community

associations to become partners as a non-governmental organization, and provides assistance. For details, visit www.epa.gov/epaoswer/osw/conserv/guide.htm.

WasteWise is a free EPA partnership program that helps organizations such as community associations eliminate costly municipal solid waste, benefitting the bottom line and the environment. This flexible program allows partners to design their own waste reduction programs tailored to their needs. Even small community associations may participate. The program provides free technical assistance to help develop, implement and measure waste reduction activities. Find out more at www.epa.gov/epaoswer/non-hw/reduce/wstewise/about/index.htm.

A fun program that encourages putting "These Come from Trees" stickers on restroom paper towel dispensers is available at <http://thesecomefromtrees.com>.

Reuse. Reuse containers and products, repairing what is broken or giving it to someone who can repair it. Donating an unwanted computer to a charity (rather than setting it out for disposal or recycling its parts) is waste prevention and reuse. So is photocopying on both sides of a sheet of paper.

Prudent ways to reuse include using durable coffee mugs, cloth napkins and towels; refilling bottles; donating old magazines and surplus equipment; reusing boxes; turning empty jars into containers for leftover food; purchasing refillable pencils; and participating in a paint collection and reuse program. Perhaps the biggest potential impact may result from reusing grocery bags.

Go to www.use-less-stuff.com for more ideas from a private not-for-profit agency that publishes a quarterly newsletter. For locations of reuse stores and other relevant information, visit the website for the Reuse Development Organization, another national nonprofit, at www.redo.org.

Reusing an item means that it continues to be a valuable, useful, productive item, and replaces new items that would use more water, energy, timber, petroleum, and other limited natural resources in their manufacture. Businesses can save significant dollars in disposal by reselling or donating items that are no longer needed to reuse stores. Many chemicals and solvents that are no longer useful to one organization can be used in other applications by other organizations. This method of "materials exchange" results in disposal savings by the generating company, and savings in the purchase of the material by the recipient organization.

Recycle. Recycle as much as possible, which includes buying products with recycled components.

Recycling turns materials that would otherwise become waste into valuable resources. In addition, it generates a host of environmental, financial and social benefits. Materials such as glass, metal, plastics and paper are collected, separated and sent to facilities that can process them into new materials and products.

Recycling is one of the best environmental success stories of the late 20th century. Recycling, including composting, diverted 82 million tons of material from landfills and incinerators in 2006, up from 34 million tons in 1990. By 2006, about 8,660 curbside collection programs served roughly half of the American population. Curbside programs,

along with drop-off and buy-back centers, resulted in a diversion of about 32 percent of the nation's solid waste in 2005.⁸¹ For specific community information on where you can recycle, simply enter your ZIP code at www.earth911.org.

A California based landscape architecture firm ably explained the need for paper recycling by creating a seven-minute film that documented the planning and creation of an art exhibit of the shredded paper the firm had generated over a 12-week period. Called "So What?" the film seeks to bring meaning to the term "sustainability," which the firm stresses has been overused to the point of becoming meaningless.⁸²

For paper recycling information resources, go to the National Association for Information Destruction website at www.naidonline.org. Another good source of information about recycling publications and educational resources is the Solid Waste Association of North America website at www.swana.org.

The "Ollie Saves the Planet" CD-ROM for kids is a great educational resource that explores the reduce, recycle, and rethink concept as applied to water, waste, energy, air and biodiversity. Also available is a "Have You Hugged Your Garbageman" t-shirt. The International Solid Waste Association also offers information at www.iswa.org.

Fluorescent bulbs require special recycling consideration. While fluorescent bulbs have commanded attention because they are four to five times more efficient than incandescent bulbs, spent bulbs have no intrinsic value or embodied energy. However, they do contain significant amounts of mercury. Recycling keeps mercury-containing products from contaminating the soil or air (in case of incineration). The National Electrical Manufacturer's Association provides the website www.lamprecycle.org with EPA regulations, instructions on handling broken bulbs, and a state-by-state clickable map with states' regulations and contacts.

In June 2008, Home Depot announced a national Compact Fluorescent Lamp (CFL) Bulb Recycling Initiative.⁸³ At each Home Depot store, customers can bring in any expired, unbroken CFL bulbs and give them to the store associate behind the returns desk for free recycling. The bulbs will then be managed responsibly by an environmental management company that coordinates CFL packaging, transportation and recycling to maximize safety and ensure environmental compliance, according to Home Depot. Most, but not all, IKEA stores offer the same free program. Additionally, www.earth911.com lists local sources for recycling CFLs.

Additionally, www.earth911.com offers local sources for recycling batteries. Go to the Recycler's World (Recycler's Exchange) at www.recycle.net/battery for a list of companies that want to purchase your specific types of batteries, such as lead acid batteries and nickel content batteries. Still other sites worth checking out are www.batteryrecycling.com and www.call2recycle.org.

In some parts of the country, oyster recycling merits consideration. In summer, adult oysters release millions of fertilized eggs. During their development, larvae may travel distances; however, when development is complete, young oysters must attach to a hard substrate such as another oyster shell. If no substrate is available, the young oyster dies. Marine organisms, including oysters, will quickly colonize a mound of oyster shells placed in brackish water with good tidal flow. This mound, called an oyster reef, provides beneficial habitat for oysters, algae, worms, barnacles, crabs minnows and fish. Several

states, including New Hampshire and North Carolina, have oyster shell recycling programs where people take oysters to a pickup area for recycling.⁸⁴

Water recycling also is gaining popularity worldwide. As early as 1999, Tokyo was recycling 61 percent of its water for nonpotable reuse.⁸⁵ (Nonpotable water is defined as water not safe or palatable for human consumption because it contains infective agents or other contaminants.)

Recycled water can be used in communities for landscape irrigation, application of landscape chemicals, cooling towers and dust suppression at construction sites. Using the same water for more than one purpose conserves water and energy otherwise required to pump and treat that water. For example, the Bernalillo County Water Utility Authority in Albuquerque uses treated wastewater to irrigate the University New Mexico sports complex, golf courses, the Balloon Fiesta Park, soccer fields, Journal Center and other sites.⁸⁶

Citing economic and environmental benefits, the City of San Diego reports that a full supply of recycled water is available even during a drought and generally is not restricted for outdoor use during normal supply conditions or droughts.⁸⁷ It offered a rate of 80 cents per hundred cubic feet (748 gallons), compared to \$2.52 per hundred cubic feet for potable water, as of July 1, 2007.⁸⁸

While nonpotable water rates are attractive for community associations, the cost to retrofit a current potable-water landscape irrigation system can be expensive. Carefully weigh advantages, such as lower water rate per gallon, against disadvantages before deciding to make a switch.

Essentially, the entire system would require rebuilding because EPA and most state regulations require heavier gauge equipment for nonpotable water. All heads, valves and meters would need to be replaced at a cost of 10 to 20 percent more than regular potable irrigation parts. Regulations aside, a tougher grade is called for to handle the odd pH of gray water, which can sometimes have such a low pH as to be mildly corrosive. For that reason, new heavier pipe is also needed (10 to 20 percent more expensive). Demolishing an old potable system can be so pricey that it is often more cost effective to leave the prior system in the ground while installing the new one.

Another cost to be considered is the dedicated gray water line coming from the utility company. Lastly, community association leaders should consider the engineering costs to determine size pipe needed from the utility.

Bear in mind that most plants, particularly turf, are pH sensitive. Unless the state regulates water quality—including pH—from gray water (or reused effluent), switching over could harm or kill grass and other expensive plantings.

In addition, the EPA and most states regulate when such water can be used and how. For example, water in some states may not be used in a densely populated site where it could be sprayed on passersby or could flow over land or pavement into the existing storm water system.

At some private large-scale associations with their own utility companies, pH-controlled gray water is limited to golf courses and unavailable for the association's use. Check with your utility about demand and availability.

Purchasing a water-filtration device is another way to access smaller amounts of nonpotable water. For example, water used to wash company vehicles may be captured and reused in chemical spray tanks for land management. The water containing oils, pollutants and pesticides—any carbon based compounds—goes into a tank that uses bio-organisms to consume them, break them down and excrete waste made of carbon dioxide and water. The resulting “clean” water, while not potable, is reusable and can even be captured on a special wash rack to be recycled for yet another use.

Ongoing costs include purchasing monthly supplies of bio-organisms. For details on wash-water treatment systems visit the Water Maze website at www.wmaze.com.⁸⁹

If your community features ponds or lakes stocked with fish, you need to be aware that discarded monofilament fishing line can entangle, injure and kill marine birds and wildlife. Several states, in conjunction with the BoatUS Foundation and the BoatUS Angler Program, collect and recycle fishing lines. Some even collect lead weights. The nonprofit Berkley Conservation Institute has recycled more than seven million miles of monofilament fishing line since the 1990s. To request recycle collection bins and a poster, contact Berkley Conservation at www.berkley-fishing.com/about_conservation.php#ref_2822. In addition, BoatUS Foundation offers bins for recycling at www.boatus.com/foundation/Monofilament/.

Whether or not you are a running enthusiast, Nike hosts a “Reuse a Shoe Program,” grinding up old shoes and turning them into athletic flooring. It takes 2,500 pairs of shoes to make a full-size basketball court. The website at www.letmeplay.com/reuseashoe/ includes drop-off locations. If you choose to resell or trade sports equipment, go to www.playitagainsports.com.

Compost (high-quality soil made from yard trimmings and food residuals) is known to make gardeners wax eloquent. For some, however, the whole process has become tiresome, particularly those loving, rambling descriptions from well-intentioned herbivores about how they create compost. Nevertheless, a reliable, no-nonsense website is the EPA’s www.epa.gov/compost/, which contains FAQs and relevant publications.

If your association participates in a composting program or advocates the practice among members, insist that feces is never included in the mix. It spreads infection to plants and, subsequently, animals.

Although compostable bio-plastics can be sent to your home compost bin or pile, not all materials are made from corn, switch grass or grain. The American Society for Testing and Materials has created two specifications approved by EPA to identify biodegradable plastics—ASTM D6400, the standard specification for compostable plastics, and ASTM D6868, the specification for biodegradable plastics used as coatings for paper and other compostable substrates.⁹⁰

Apartment dwellers can create compost below the kitchen sink, using a bucket with earthworms and veggie scraps, eggshells, coffee grounds, bread and dryer lint, creating potting soil for their houseplants.^{91 92}

There is some truth to the adage that if a plant is languishing in your garden, throw it on the compost pile where it will grow, bloom and flourish without your tending it. If you want to transport your compostable materials elsewhere, a municipal composter location in your region can be found at www.findacomposter.com.

A good source for all other recycling is www.recycle.net, established to provide a forum to promote the trade of scrap and waste materials. The website's recycling categories for buy, sell or trade include automotive parts, computer and electronics, scrap iron, exotic metals, precious metals, minerals, paper, liquid oils and chemicals, tires and rubber, and wooden pallets.

Be careful when either throwing away or recycling techno trash such as cell phones, computers, TVs, computer monitors, iPods, MP3 players, digital cameras and PDAs. When China recently outlawed the import of electronic and computer scrap, waste experts say that the clampdown has driven tons of e-waste elsewhere to Malaysia, Ghana and other third world countries. The resulting supersite dumps are creating huge stockpiles of dead machines containing lead, PVCs, barium, chromium, mercury, beryllium and cadmium—all carcinogens.

Third-world entrepreneurs working there in unsound salvage operations dismantle these broken devices by hand to extract the metals, which are then sold. This is dangerous to their health and deadly for the world's environment.⁹³ For information on reputable charities and recyclers, go to www.epa.gov/recycling. As an example, the national Cristina Foundation, www.cristina.org, connects computer donors with the needy.

To donate your used cell phone to someone in a developing country, visit www.collectivegood.com or for other options go to www.recyclewirelessphones.com. To reprogram your phone to dial 911 and give it to domestic violence victims, go to www.donateaphone.com. To recycle single line phones, www.reclamere.com.

Goodwill, www.goodwill.org, accepts working appliances, and you can also recycle at the Steel Recycling Institute, www.recycle-steel.org.⁹⁴

Before tossing cardboard boxes, contact the local shelter to ask if they can use them. Offer them at www.freecycle.org. If your workplace collects at least 100 boxes a month, www.usedcardboardboxes.com accepts them for resale.

If you have scratched CDs, DVDs and Game Disks, consider sending them to Auraltech, www.auraltech.com, for refinishing. Swap exercise videos for others at www.videofitness.com.

Donate wearable women's business clothing at www.dressforsuccess.org. Offer unwearable clothes and towels to the local animal boarding shelter. Clothes swaps often occur at faith congregations and community centers.

Your local Lion's Club may collect used eyeglasses. Drop-off boxes are often found at local merchants. Lenses are reground and given to people in need.

Your local pack-and-ship store will likely accept foam peanuts for reuse. The Peanut Hotline at www.loosefillpackaging.com is a national reuse program for plastic packing peanuts. For information on recycling foam blocks, go to www.epspackaging.org/info.html.

Spent ink-toner cartridges are valuable. Trade them in for discounts or refill them at retail stores. Collecting used ones for recycling can even be a fundraiser for groups.⁹⁵ Currently, www.recycleplace.com pays \$1 each.

Recycling information for used motor oil for each state is available: www.recycleoil.org.

Buy a toothbrush, razor or other product from preserve[®], www.recycline.com, and this company will take it back to be recycled again into plastic lumber.

Conserving Water, Saving Water, Storing Water, Catching Rainwater

The American Water Works Association (AWWA) is a national nonprofit organization providing knowledge and advocacy to improve the quality and supply of water in North America. AWWA offers resources for community leaders regarding conserving water at www.awwa.org. Check out AWWA's WaterWiser, the water efficiency clearinghouse, at www.awwa.org/Resources/content.cfm?ItemNumber=29269&navItemNumber=1561.

Denver has a good "Use Only What You Need" campaign at www.useonlywhatyouneed.org/. Download the Rocky Mountain Institute's excellent pamphlet, *Water Efficiency for Your Home*, at www.rmi.org/images/PDFs/Water/W95-36_WaterEff4Home.pdf. Also in Colorado, the Rocky Mountain Institute offers the North Central Arizona Water Demand Study, which includes programs that could be modified to community use such as:

- Constructing wetlands to put wastewater from Kachina Village to use providing wildlife habitat and an aesthetic/recreational amenity.
- Disinfecting wastewater with ultraviolet light in the South Grand Canyon Sanitary District treatment plant
- Reusing wastewater as sprinkler irrigation (and overspray to cut down on dust) at the Northern Arizona University track and field complex.
- Using an ultralow-flow, electronically activated faucet at the Grand Canyon National Park Canyon View Information Plaza.

To review the findings, visit https://www.rmi.org/images/PDFs/Water/W02_AZWaterDemandStudy.pdf.

Controlling water consumption in buildings can yield considerable savings in a community.⁹⁶ If a 600-unit townhome community currently paying a sewer rate of \$2.75 per 1,000 gallons of water reduced its consumption by 10 gallons per unit per day, the savings would amount to \$6,000 per year.

You can make a similar analysis of your own community's water assumption. Start by checking the historic record at a glance and preparing a spreadsheet analysis. Review water bills to find out how much water each metered account used over the past three years. Using an Excel spreadsheet (or columnar accountant's pad), list each meter on the left of the page. Across the top, establish the billing period. Write all the accounting data in the appropriate column. Total each column. Determine the gallons consumed per metered account per day. Divide this by the total number of units served by each metered account to determine an average number of gallons used per day per unit.

To see how your community stacks up, consider that in 1993 average consumption of 125 to 150 gallons per unit per day was the norm. The average American uses 45 to 75 gallons per day, according to the AWWA.

Survey your members. Find out if they are aware of any leaking. The survey can include a politely worded letter indicating that water/sewer rates have increased a certain percentage and that the survey is the beginning of an effort to keep assessments down with water consumption methods, while still providing ample water to each unit.

Repair leaky faucets and toilets without cost to the respondent. Schedule plumbers' visits to install conservation devices such as water saving showerheads and toilet flushers.

You may be able to save even more water by performing a water use slippage test. Monitor a water meter at 3 a.m., when normal usage is barely at a minimum, and record the consumption. If the rate is abnormally high during this time, there is a problem unrelated to regular usage.

By following a few water-conservation practices in common areas, association managers and board members can make a big difference. For example, use drought-tolerant plants. A 2005 study found that property owners who removed grass and replaced it with water-efficient xeriscape on average saved 55 gallons of water per square foot per year by converting grass to a water smart landscape. That amounts to a savings of 75.4 percent over traditional landscaping.

Even a densely-planted xeriscape saves enormous volumes of water.⁹⁷ To find the most drought tolerant species, use types of plants growing in the woods and meadows nearby. However, leave those plants in the wild and find your own at the native plants garden center.⁹⁸

If you must water plants, do it in the morning hours when there is less wind or evaporation. Also, keep water close to the ground so it is less prone to evaporation or wind loss.

Check your watering system once a month and make adjustments. Install rain gauges on irrigation systems to stop irrigation after a certain amount of rainfall and soil moisture meters to cancel planned irrigation if garden soil is moist enough.

Send all gray water from your washing machine (25 to 35 gallons per load for top-loading machines) directly to water landscaping. The detergent you add will not harm plants.

Install drip irrigation only (no spray heads) and remove certain turf (mowed lawn) areas. If you are brave enough, remove all landscaping and turf areas and their irrigation systems. Allow wild grasses and plants to grow into a future forest. Assume that during dry periods, the area will brown out nicely then return to green when precipitation returns.

Moving now to the bathroom, you can economize and protect the environment by installing water-saving toilet-tank valves to replace old valves⁹⁹ Even toilets in good repair account for up to 30 percent of indoor water use.¹⁰⁰

Toilets made before 1992 do not meet a water-efficient design standard of 1.6 gallons per flush maximum. Placing a water bottle full of sand or water in these toilet tanks reduces the amount of water flushed with each use. Do not use bricks for this because they can break down and cause problems in the toilet system.

Urinals before 1992 do not meet water efficient design standard of a gallon per flush maximum. Ultra low-flow valves are 0.5 gallons per flush.

In addition, replace valve stems, seats and washers on leaky faucets. And install water-saving shower heads designed to flow at 2.5 gallons per minute or less. This can make a noticeable difference because bathing accounts for 32 percent of residential water use. Install timers on showers in swimming pool bathhouses.

Realize even more savings by installing flow restrictors to limit lavatory faucet flow to one gallon per minute. To save on labor costs, schedule routine checks and repairs on bathroom and kitchen fixtures during the same visit.

In the boiler room, monitor and maintain boiler water systems monthly to prevent scale and corrosion and optimize condensate reuse. Check for pinhole leaks on central

system convactor coils. And assure boilers are using in-system condensate for make-up water rather than calling for fresh unheated water.

At the cooling tower, install a controller to regulate blow-down flow based on conductivity and a water meter on the make-up flow line.

Swimming pools provide many opportunities for water conservation. Cover pools when not in use to prevent evaporation. The water levels should not be too high since water splashes easily over the edges.

Watch for surface cracks in pools and fill any you find quickly because they can result in water leaks. Consider reusing wading pool water for plants irrigation.

Enlist members in your water-saving efforts. Use your newsletter and other communications tool to provide them with water-saving tips such as:¹⁰¹

- Keep drinking water in the refrigerator. This will reduce the amount of water that is generally wasted when waiting for the cold water to reach the faucet. It will also improve the taste by allowing chlorine and sulfur smelling molecules to evaporate.
- Know where the water shutoff valves are for your home. Accidents happen, and when they happen to pipes or water heaters, it is best to know how to shut the water off rather than dealing with a flood and a high water bill later.
- Turn the faucet off when brushing teeth or shaving.
- Limit shower time to five minutes, which uses the same amount of water as a bath.
- Turn off the water when not rinsing in the shower.
- When cleaning out your fishbowl, use the dirty water to water plants around the house. Not only will you conserve water, but you will also fertilize the plants with nitrogen and phosphorus in the process.
- Rinse dishes in standing water at the kitchen sink rather than running the faucet.
- Check toilets for leaks. Simply place food coloring or a dye tablet in the toilet tank and wait 10 to 20 minutes without flushing. Dye seeping into the toilet bowl indicates a leak, most likely from the flapper. A leaky toilet flapper can waste from 30 to 300 gallons of water per day. For advice on fixing leaky toilets, visit www.h2ouse.org.
- Sweep driveways and sidewalks rather than spraying them with water.
- Check for leaky outdoor hoses and faucets. To find out how much water is being wasted, visit the Water Wise Drip Calculator at www.awwa.org/advocacy/learn/conserves/dripcalc.cfm.
- Don't run the hose when washing the car. Instead, try using a bucket of soapy water. Use the hose only to rinse.
- Cover private pools and hot tubs when not in use to prevent evaporation.
- Drain outside spigots to prevent freezing in the winter, which could lead to burst pipes.
- Replace your old clothes washer, the second largest water user in your home. Energy Star™ rated washers that also have a "water factor" at or lower than 9.5, use 35 to 50 percent less water and 50 percent less energy per load.

Drought conditions accentuate the need for water conservation. In anticipation of that situation, develop a community drought-contingency plan for water management. Work with your local utility and higher education institution to identify and implement modifications to achieve additional specified reductions in water consumption.

Community associations can learn a great deal about proper water consumption practices from the hospitality industry. For 15 years, the “Green” Hotels Association, www.greenhotels.com, has been committed to encouraging promoting and supporting ecological practices in the hospitality industry. That association and the 2007 National Eco Tourism Conference in Kenya recommend the following simple measures:

- Perform a water audit to identify major consumers.
- Meter different sections of the hotel or resort.
- Install flow meters in water consuming sections kitchens and laundry.
- Install water saving measures, including energy efficient shower heads and toilets. Toilet tank fill diverters can save $\frac{3}{4}$ gallon of water per flush.
- Direct rainwater downspouts to collection tanks for landscape irrigation; harvest rooftop water if your state and locality will allow it.
- If the local health department will allow, laundry drains and other gray water can water landscaping.
- For hoses for landscape irrigation, fit them with hand triggers to automatically switch off when not in use.
- Encourage guests to reuse their towels to conserve laundry water.
- Benchmark for continual improvement. Seek cooperation of the housekeeping and kitchen staff. Explain your interest and ask them to exercise common sense. Overcome middle level inertia. Stress that you are seeking easy-to-implement and cost-effective measures.
- Regular loss assessments for the resort should include water overflows, leakages and spillages. Establish a preventive maintenance program.
- Consider substituting toxic or hazardous materials with green products that will take less rinsing.

Like hotels and resorts, community associations should consider collecting rainwater, a practice used for the last 4,000 years.¹⁰² It makes a good option for providing a centralized water supply system in areas lacking fresh surface water or groundwater. In the Negev Desert, human habitation and cultivation occurs solely with collected rainwater, as little as four inches of rain annually.¹⁰³ As a comparison, west Texas receives eight to 10 inches per year; Arizona, seven to 11 inches per year.¹⁰⁴ ¹⁰⁵ A good manual on rainwater harvesting is provided by the Texas Water Development Board at www.twdb.state.tx.us/iwt/Rainwater.asp. You will find a short, interesting rainwater-collection video from New Delhi at www.youtube.com/watch?v=wWnhYIIKY0U.

Permaculture¹⁰⁶ consultant Brad Lancaster harvests over 100,000 gallons of rainwater a year on his $\frac{1}{8}$ acre urban lot in the Sonoran Desert.¹⁰⁷ Every inch of rainfall on an acre produces 27,000 gallons of water, according to him. He recommends the following methods:

- Harvest using the existing soil in your yard as a tank. Make a bowl-like shape and the plant becomes the living pump, allowing peaches to grow in the desert.
- Harvest rainwater from a roof into a tank.
- Harvest the water coming from household shower, bathtub, sink and the washing machine. Lancaster says 30 to 50 percent of potable drinking water consumed by single family home is used for landscape use, so it is better to use gray water for that function.

Currently, the state of Arizona offers a tax rebate of up to \$300 for installing rainwater harvesting and gray-water harvesting. Other states have similar programs; refer to your state website for more information.

The Civano Association in Arizona encourages residents to collect rainwater from roofs and shows them how to build above ground collectors for later use and lists local contractors who provide this service. For details, visit www.civaneighbors.com/docs/presentations/23July2006_RainWaterHarvesting_Civano.pdf.

People who make a personal effort to collect and use rain are less likely to waste water or tolerate public policies that allow waste by others, such as inefficient irrigation techniques or inappropriate residential landscaping. When people are maintaining gutters and cisterns to ensure they can flush their toilets or grow their gardens, they are more likely to appreciate the importance and scarcity of the resource.

Energy-Efficient Building and Housing

A good place to start in improving energy efficiency in buildings is purchasing energy-saving devices, particularly light bulbs and fixtures. Although shipments of incandescent lamps have declined steadily since 2004, dropping 18.6 percent in 2007 alone, compact fluorescent lamp (CFL) shipments grew by 33 percent, compared to the same period last year. CFL shipments have expanded by a magnitude of five since 2004.¹⁰⁸ Find out more at *Changing One Billion Light Bulbs*, www.onebillionbulbs.com/. As of August 2008, CFLs are 24.7% of the whole light bulb market, according to The National Electrical Manufacturers Association, www.nema.org.

Why switch? CFLs use less energy, have a longer lamp life, and produce less heat. The savings from five bulbs could amount to about \$100 per year.

Insist on Energy Star appliances when replacing clothes washers, dehumidifiers, dishwashers, refrigerators, air conditioners and more. For a list of appliances and sources, go to the EPA website at www.energystar.gov/.

A number of small steps can help maintain your community's existing buildings and reduce emissions from them.^{109 110} First, check that the building equipment is functioning as designed. Regularly inspect all equipment and controls, including a double check of energy management system programming.

Consider your building's cleaning options. Your janitors could go through the building as a team, floor by floor, turning off the lighting as they go. Better yet, have them clean in the day when there is light anyway. Or install occupancy sensors to automatically turn off lights when a floor is vacant.

Tell your staff about your commitment to energy savings. Use the community newsletter to keep members and staff informed about your energy savings goals and how they can help and benefit.

Harvest daylight. Locate workstations adjacent to windows. Then use DaySwitch™ on light switches. The photo sensor measures daylight levels and sends a signal to a microcontroller that switches lights on and off.¹¹¹ Payback period is approximately three years.

For large windows in direct sunlight, install UV protection window film. Caulk and weatherstrip windows and exterior doors.¹¹² In addition to the Energy Star appliances mentioned earlier, install Energy Star rated windows and doors.

During off hours, make sure to power down everything, including copiers, kitchen

equipment and task lights. Ask cleaning and security personnel to turn off miscellaneous items such as coffee pots, kitchen equipment and individual office lights. Have staff activate power management features on their computers and monitors. Unplug laptops and turn off equipment.

In commercial kitchens, use microwaves, where you can, instead of ovens. The reduction in carbon-dioxide emissions would be about a pound per meal.

Replace inefficient exit signs with high-efficiency light emitting diode (LED) exit signs. These operate around the clock and have lower maintenance costs due to their extended life.¹¹³

Close window blinds and curtains on summer days. In winter, close curtains at night to capture passive solar heat. This simple act can save 25 to 75 percent on heating and cooling bills and dramatically reduce carbon dioxide emissions. Similarly, you can make noticeable changes in your power bill while curtailing emissions by adjusting thermostats down two degrees in winter and up two degrees in summer. For maximum energy efficiency, install programmable thermostats, which cost as little as \$35 and can save \$150 annually.

By setting water heaters at 120 degrees, you can reduce emissions 1,200 pounds per year for electric and 880 pounds per year for natural gas. Likewise, low-flow showerheads in community buildings can reduce emissions 1,800 pounds per year for electric and 430 pounds per year for natural gas.

Fix leaks. A leak of one drip per second can cost \$1 per month.¹¹⁴ For more water saving tips, see the water savings section.

Recycle newspapers, beverage cans and office paper. Carbon dioxide emission reductions could amount to 1,300 pounds per year. And use recycled paper (100 percent post consumer) to reduce carbon dioxide emissions by six pounds per ream.

Adjust ventilation. Reduce exhaust and outdoor air ventilation rates within codes. Take a look at the fans and adjust ventilation in unoccupied and low-density areas to reduce the ventilation to a practical limit.

By using a laptop rather than a desktop computer, you can reduce energy consumption by a surprising 80 percent. You will also cut carbon dioxide emissions by 400 pounds annually. Use lithium-ion batteries instead of AA or AAA batteries to power small electronics, and you can reduce carbon dioxide emissions by 450 pounds per year. Removing carpeting and installing other flooring yields carbon-dioxide emission reductions of 4,000 pounds for every 800 square feet.

Add more insulation in attic spaces, but make sure that insulation does not cover soffit vents, which would restrict attic ventilation. Without ventilation, attic space can become wet, making insulation ineffective and damaging the home.¹¹⁵ Insulate any knee walls, which are vertical walls with attic airspace behind them.

Insulate around water heaters unless the manual specifies otherwise. Optimal water heater temperature should be 120 degrees. Consider using a solar water heater.¹¹⁶

The American Society of Heating Refrigeration and Air Conditioning Engineers offers a 105-page document about green-sustainability practices in buildings, including theaters, health facilities, athletic or recreational facilities and even dedicated outdoor air systems. You may download this resource at www.engineeringforsustainability.org/docs/greentips_2006.pdf.

A 2008 study indicates that LEED (Leadership in Energy and Environmental Design) certification or the Energy Star label buildings outperform their non-green counterparts in occupancy, rental rates and sale prices.¹¹⁷ The LEED Green Building Rating System, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for environmentally sustainable construction. As a manager or community leader, you can hire a professional energy auditor to determine ways to reduce your buildings' energy consumption. For more information, go to the Department of Energy's consumer's website at www.eere.energy.gov/consumer/your_home/energy_audits/index.cfm/mytopic=11180.

In your efforts to go green, consider looking to your roofs for significant energy savings. A green roof replaces traditional roofing with a lightweight, living system of soil, compost and plants. It creates a thin, green skin atop a building that filters rainwater and some of its pollutants. The plants produce oxygen, which helps clean the air. A green roof reduces a building's heating and cooling costs, acting as a form of insulation. And the plants lessen the heat island effect, where buildings warm up so much that they heat the surroundings.¹¹⁸

Most flat roofs in the U.S. can support 15 to 25 pounds per square foot. This means that they can support soil three to four inches deep.

Conventional roofing is \$5 to \$10 per square foot. A green roof will cost \$10 to \$25 per square foot, but the cost is made up in savings in energy use and lower maintenance. And experience with green roofs in Germany shows that they can have a useful life of 40 to 50 years compared to conventional roofs' 12 to 20 years. Other resources for Green Buildings include:

- Florida Green Building Coalition, www.floridagreenbuilding.org/db/
- Architects for Social Responsibility, www.adpsr.org
- American Planning Association, www.planning.org
- Building Concerns, www.interiorconcerns.org
- Energy Efficient Building Association, www.eeba.org
- Global Environment Options, www.globalenvironmentaloptions.org
- Pacific Northwest Prevention Resource Center, www.pprc.org
- Smart Growth Network lists programs and resources by state, www.smartgrowth.org
- U.S. Green Building Council, www.usgbc.org
- Urban Land Institute, www.uli.org

Development Innovations

The "Smart Growth" development concept is making a difference all over the world. Proponents advocate compact, transit oriented, walkable and bicycle-friendly communities.

New Pattonsburg, Mo. (population 400) was relocated after three devastating floods in 1993. With the help of the U.S. Department of Energy, the Federal Emergency Management Agency and the Missouri Department of Natural Resources, the town was rebuilt to include a pedestrian-friendly downtown, a storm water management system consisting of constructed wetlands, sustainable town policies (for solar access, energy efficiency and a best-building orientation), a biogas generation plant for the area's electricity that runs from hog manure, and schools that are monolithic domes.¹¹⁹ Read more on the website for National Center for Appropriate Technology at www.freshstart.ncat.org/case/dpnewpat.htm.

The micro-compact home was exhibited by the Museum of Modern Art in New York City from July 20 through October 20, 2008. It featured one prefabricated “modern dwelling,” which was an eight-foot, six-inch cube, copyrighted by architect Richard Horden of Horden Cherry Lee, London¹²⁰ and Haack Hopfner of Munich. Fabricated in Austria, the home is available in several finishes and fabrics. It is built for two people and includes functional spaces for sleeping, working, dining, cooking and hygiene. You can find out more at www.microcompacthome.com.

Energy and Power Innovations

Be sure to verify with your community’s architectural review committee or board that alternative energy sources are approved before you make a commitment to purchase and install them.

Geothermal heating and cooling. Temperatures four to six feet below the earth’s surface remain relatively moderate and constant all year. A geothermal system circulates a water-based solution through a buried loop system to take advantage of these constant temperatures. A single unit can heat and cool your home and provide hot water as well.

According to the U.S. Department of Energy, the average heat pump would cost \$2,500 per ton of capacity.

Old systems were open loop, meaning that they took water from underground aquifers and discharged the used water above ground. In most new systems, the water solution flows in a closed loop going from below ground into the home and then returns to below ground in a continuous loop. There is no discharge of hot water into the environment. Three good sources for additional information are www.energyguide.com, www.geocomfort.com, and www.eere.energy.com.

Wind turbines. A wind turbine collects kinetic energy from the wind and converts it to electricity that is compatible with a home’s electrical system. Compatible with community use, they are usually used in conjunction with a local utility or as a stand alone unit.

According to the American Wind Energy Association, a wind turbine can lower an electricity bill by 50 to 90 percent. Wind turbine owners often enjoy total electric homes with monthly utility bills of only \$8 to \$15 for nine months of the year. Small turbine costs anywhere from \$6,000 to \$22,000 installed, depending on size application and service agreement. Some states provide tax incentives and rebates. Learn more at www.awea.org.

Solar power. When sunlight hits solar cells (also called photovoltaics), electrons are released. The electrons then flow onto wires, forming direct current (DC), the same kind of current that flows from a regular battery. A four-inch silicon cell can produce about a watt of DC electricity, according to the Northeast Sustainable Energy Association.

Solar power works as a stand alone system or in conjunction with a local utility. The amount of power produced depends on the size of the system. In regions that enjoy a lot of sunlight, a solar system might deliver all the electricity needed, but the cost to implement a 100 percent system may be prohibitive. Still, a feasible system may produce 25 to 50 percent of energy needs. A two-kilowatt system may cost between \$16,000 and \$30,000, while a 5-kilowatt system may be installed for \$35,000. Some states offer rebates and incentives. For more information, go to www.nesea.org or www.amesolar.com.

Fuel Cells. A fuel cell converts hydrogen and oxygen into electricity. Fuel cells resemble batteries in their design, yet they do not run down or need recharging. Fuel cells are used at hospitals, nursing homes, hotels, office buildings schools and utility power plants. They are either connected to the electric grid or installed as a grid-independent generator. Currently there are no residential applications.

In large-scale building systems, fuel cell cogeneration systems can reduce facility energy service costs by 20 to 40 percent over conventional energy service and increase efficiency by 85 percent. These systems, not readily available commercially, are most often engineered solely for the building they service.

There are fuel cell applications for computers, cell phones and laptops, largely because one charge would last far longer than conventional nickel or lithium-ion batteries. For more information, visit Fuel Cells 2000 at www.fuelcells.org.

The U.S. Department of Energy also offers plenty of information on energy efficiency and renewable energy at www.eere.energy.gov. Still another source for building materials innovation is www.energy.ca.gov/. There you will learn how the California Energy Commission is working to license power plants; ensure homes, buildings and appliances are energy efficient; make the most of indigenous renewable energy resources such as solar, wind, biomass and geothermal; analyze transportation energy demand and support alternatives to conventional fuels; assist new energy technologies with research and development and help them enter the marketplace; and direct the state's response to energy emergencies.

Building Materials Innovations

Returning to the use of clotheslines may not seem innovative at first, but rethinking the way you do things and realizing the old ways may make sense environmentally requires an open mind. Similarly, if you rethink your floor coverings, you may realize that tile may be preferable to carpet, which may suffer from formaldehyde breakdown contamination through use. As simple a step as adding UV protection film on windows can enhance a room's energy efficiency and protect furnishings from fading in the sun.

Another exciting building materials innovation is the tankless water heater. Traditional water heaters heat anywhere from 40 to 80 gallons of water at a consistent 120 degrees around the clock, but tankless heaters warm the water only when you need it. As long as a faucet shower or hot water appliance is operating, the tankless continues to run (until the water is turned off). Tankless costs more, but the U.S. Department of Energy estimates projected energy savings of around 50 percent. These compact units are the size of a medicine cabinet and can go on the wall, in a closet or outside a home.

If green roofing is impractical for your community, Energy Star qualifies roof products, typically metal roofs or shingles, with a special coating that reflect more of the sun's rays, which in turn can lower the roof's temperature by up to 100 degrees. This decreases the amount of heat transferred into a home, reducing the need for air-conditioning. For more information, visit www.energystar.gov.

The National Institute of Standards and Technology designs software supporting decisions for green building products and design. For details, visit www.bfrl.nist.gov/oae/publications/proceedings/cib.pdf.

Land and Lakes Management Innovations

Many communities have set up separate nonprofit corporations to preserve or conserve land in their communities. Like them, you can emphasize native plants, removing invasive non-natives such as kudzu and Chinese tallow tree, which can choke out indigenous plants. Some community associations are removing turf and plant beds entirely and returning portions of their common areas to forest, prairie grass land or wild dunes

Still another step being taken by some community associations is the removal of their chemical budgets for pond maintenance to curtail plants and algae and instead depending on natural organisms. In some cases, communities are setting aside areas for wildlife habitat.

Community association professionals often are entrusted with the stewardship of large tracts of maintained and natural open space. Two areas that come to the forefront are golf courses and equestrian facilities such as pastures and polo fields. Other areas that receive less attention but have major impacts are parks, forestland and lakes. Associations have turf care operations that maintain common areas and individual private lawns for owners. Right-of-way maintenance can also have significant impacts in many communities. Each of these areas bring unique opportunities for green solutions.

Improved management practices and technologies continually evolve to address the increased focus on proper stewardship in environmental issues. Investing in continuing education for the key players in community operations is vital to keep the community abreast of these issues and the scalable solutions that can be implemented by both the community and individuals. Golf course superintendents and directors of community maintenance, public works, utilities, and grounds are primary staff members that should be fully aware of the issues and goals in this area.

The Golf Course Superintendents Association of America (GCSAA) and its Environmental Institute for Golf are a major resource in both researching environmental issues and providing quality continuing education for all types of turf management. The GCSAA has identified five focus areas for addressing environmental issues: Water Management (Conservation and Quality); Plant Management; Wildlife and Habitat Management; Energy and Waste Management; and Site Selection, Design and Construction.

Audubon International, another leader in the promotion of green environmental management, offers programs that are specific to golf courses but also address sustainable private communities. Certification programs for courses and communities provide the opportunity for extensive planning and review to develop best management practices. In these, the development of a Natural Resource Management Plan addressing the five aforementioned issues is a key focus.

Maintaining acres of turf to the quality required by community associations can be a water-intensive operation. Many older communities and golf facilities may have irrigation systems with outmoded technology that may not reach the conservation goals for environmentally sensitive operations. Some of the areas identified as opportunities include:

- Use of reclaimed and effluent water
- Sophisticated weather instruments
- Drought and salt-resistant grasses
- Water quality monitoring innovations
- Storm water management

The management of appropriate turf and plant species in a high-quality manner entails numerous environmental focus areas such as chemical usage reduction and organic pest and insect management.

The Bio-Integral Resource Center (integrated pest management), www.birc.org/, provides resources and information about the latest research and practice of integrated plant management.

The normal 18-hole golf course consists of 100 acres of intensely managed turf and 50 acres of scenic buffer. This diverse habitat typically contains wetlands, grasslands, streams, ponds, and various types of forest. Management practices to benefit wildlife involve strategic brush placement, food and water sources, nesting structures and native plantings (berries, seeds, nuts).

Proven strategies include the creation of vegetation corridors linking isolated habitat patches, the avoidance of applying fertilizers and chemicals on paved surfaces, and vegetation buffer strips on streams and ponds to reduce run-off of sediment and chemicals.

As with most community operations, appropriate energy usage, waste reduction and reuse has a significant place in green management practices at golf courses. Focus areas include environmentally-friendly products, "green purchasing" practices, waste management, recycling, composting, alternative fuels and electric carts.

Much of a community's amenity infrastructure requires periodic renovation and replacement. This is particularly true of golf course amenities, and always affords the community association professional an opportunity for positive environmental impacts.

In considering any infrastructure renovation, employing the latest techniques in site selection design and construction techniques can significantly reduce the environmental impact of a facility. These projects should consider many elements in the planning process. Major considerations include the relocation of key elements to reduce impact, use of natural storm water filtration techniques instead of traditional surge basins, reduction of impervious surfaces, reduction of maintained turf acreage, and turf and materials selection.

While much of the research in this area has been developed for the golf industry, these resources are applicable throughout the scope of natural elements under the stewardship of community associations. Green operations are not simply for the large acreage tracts. Maximum benefit results when the practices are carried into all residential, commercial and common areas.

The responsibility for good stewardship is not reduced simply because many landscape maintenance services are contracted with outside vendors. When developing bid specifications for these services, many of these elements can be incorporated. Quality turf and landscape maintenance contractors are aware of the changing trends in management practices.

Helpful resources include:

- Golf Course Superintendents Association of America, www.gcsaa.org/
- The Environmental Institute for Golf, www.eifg.org/
- USDA Insect and Pest Management Information Center, www.ipmcenters.org
- EPA Environmental Stewardship, www.epa.gov/stewardship/
- Audubon International, www.auduboninternational.org/

Green Product Availability to Community Members and Staff

A growing number of communities are supporting sustainable agriculture, which refers to the ability of a farm to produce food indefinitely without causing severe or irreversible damage to ecosystem health. Two key issues are biophysical (the long-term effects of various practices on soil properties and processes essential for crop productivity) and socio-economic (the long-term ability of farmers to obtain inputs and manage resources such as labor).

Going hand-in-hand with sustainable agriculture is the concept of buying local. The goal is simply to buy food (or any good or service) produced, grown, or raised as close to your home as possible. With industrialization, food is now grown and processed in fewer and fewer locations, meaning it has to travel further to reach the average consumer's refrigerator. Although this method of production is considered efficient and economically profitable for large agribusiness corporations, opponents characterize it as harmful to the environment, consumers and rural communities.

Consider selling locally made gifts and products clearly marked as earth-friendly to show your community's commitment to going green. Ask members and staff to share their ideas. For an abundance of information to share with members and staff concerning green community living, go to www.earth911.com.

Energy Efficient Transportation

Three times in the past three decades, oil-dependent economies have been hindered by dramatic oil price increases—in the mid 1970s, the early 80s and since 2006. Alexander Iler, Assistant Director General for the Food and Agriculture Organization of the United Nations, indicates that the gradual move away from petroleum will continue: "Over the next 15 to 20 years, we may see biofuels providing a full 25 percent of the world's energy needs."¹²¹

Biodiesel (waste vegetable oil and animal fats). Feeling the pain of higher fuel costs, some residents are making their own biodiesel from waste vegetable oil. At a cost of about \$1.50 per gallon, biodiesel can be made from waste oil pickup at a local restaurant, mixing chemicals with the oil, and then filtering out the fuel from the residual products (glycerin and goo). Drawbacks to this production are that: 1) the member will need the approximate size of a car-parking space that is covered for machinery to make the conversion, 2) the machinery looks like a liquor still so would not be ARB compatible in most instances unless screened, and 3) the work is a three-day, labor-intensive process that requires strict adherence to established guidelines.¹²²

Ethanol. This fuel can be synthesized biologically (from plants, not petroleum) and works in current engines. Ethanol is already a U.S. fuel additive. Butanol, another type of bio-alcohol like ethanol, is less toxic than ethanol and has a high flashpoint of 95 degrees, which is a benefit for fire safety but may cause some difficulty starting engines in cold weather. Currently, Brazil and the United States are the largest producers of alcohol fuels in the world.

The U.S. Department of Energy offers a website to help consumers understand the average fuel economy of their cars and light trucks. Go to:

- www.fueleconomy.gov/feg/gasprices/states/index.shtml to find the location of the cheapest gasoline in your city

- www.fueleconomy.gov/feg/drive.shtml for gas mileage tips
- www.fueleconomy.gov/feg/findacar.htm to find a compare costs and mileage for a new car

Among the most fuel-efficient vehicles are hybrid electric models, which combine a conventional propulsion system with a rechargeable energy storage system. Unlike battery electric vehicles, they are not hampered by range.

In 2007, Canada introduced a fuel efficiency initiative, which included a performance based rebate program offering up to \$2,000 for the purchase of a new fuel-efficient vehicle and a Green Levy (tax) on fuel inefficient vehicles.¹²³ To encourage hybrid electric models, certain states—New York, Virginia, California—allow these vehicles with single occupants to enter high-occupancy lanes.

That incentive indeed has boosted sales of the models in those states. The list of such vehicles continues to grow. In 2008, it included the BMW 1 Series, Cadillac Escalade, Chevrolet Malibu, Chevrolet Tahoe, Chevrolet Silverado, Dodge Durango, GMC Sierra, GMC Yukon, Honda Civic Hybrid, Lexus GS 450h, Lexus LS600hL, Mazda Tribute, Nissan Altima, Saturn Aura, Saturn Vue Green Line, Toyota Camry Hybrid, Toyota Kluger/Highlander Hybrid, and Toyota Prius.

The latest hybrid technology is the Plug-in Hybrid Electric Vehicle (PHEV). The PHEV consists of a gasoline-electric hybrid whose battery pack (usually lithium-ion) is upgraded to a larger capacity, which can be recharged by either a battery charger hooked into the electrical grid or the gasoline engine (only if required). The car runs on battery power for the first 10 to 60 miles, with the gasoline engine available for faster acceleration.

After the battery is nearly discharged, the car reverts to the gasoline engine to recharge the battery or the owner can return the car to the charging station. This may get around the fundamental obstacle of battery range that has made nearly all pure electric cars impractical. Fuel costs (ignoring conversion costs), in principle, may be as low as five cents per mile. It remains unclear whether converting an existing hybrid car will ever pay for itself in fuel savings. No major car company offers PHEVs yet. However, BYD Company, China's largest mobile phone battery maker, says it will launch production of its mid-sized sedan, the BYD F6DM, in the second half of 2008.¹²⁴

To learn more, visit the U.S. Department of Energy's website on Energy Efficiency and Renewable Energy at www.eere.energy.gov. Additionally, Friends of the Earth U.S., www.foe.org, has a good article on plug-in cars.

The U.S. Census indicates nearly 4.2 million people in the U.S. worked from home in 2000, up from 3.4 million in 1990. Working from home saves energy and time by cutting out the commute but it may increase your home energy bills.¹²⁵

Getting Help from Environmental Professionals

Just as association managers and community association volunteers are becoming more interested in going green, so are professionals in other industries, as well as a whole new breed of environmental specialists. For example, the American Institute of Architects, www.aig.org, now has public policies on building green. AIA also supports the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, which provides a suite of standards for environmentally sustainable construction. AIA also supports

the EPA's Energy Star Challenge, the national call-to-action to improve the energy efficiency of America's commercial and industrial buildings by 10 percent or more.

The American Society of Landscape Architects, www.asla.org, has adopted public policies on sustainable land management. The group also embraces the Sustainable Sites Initiative, which offers a certification that is the landscape architect's version of the LEED certification.

Waste management consultants can be very helpful with recycling plans and proper hazardous waste disposal. Increasingly, municipalities have become involved in this domain and may also offer useful resources for waste management.

You can gain useful horticultural assistance from a number of groups, including:

- American Society of Consulting Arborists, www.asca-consultants.org
- American Horticultural Society, www.ahs.org
- Society of American Foresters, www.safnet.org
- Bio-Integral Resource Center (integrated pest management), www.birc.org/

The roster of land conservancy or land advocacy groups eager to lend horticultural assistance, often at no charge, includes:

- The Nature Conservancy, www.nature.org
- The Wilderness Society, www.wilderness.org
- The Trust for Public Land, www.tpl.org
- Environmental Defense Fund, www.edf.org
- Natural Resources Defense Council, www.nrdc.org

Getting Community Recognition

As an association leader, you naturally want your community to stand out as excellent. Sometimes the best recognition is receiving national certification from an outside professional organization, showing that your community is indeed an attractive shade of green.

The National Wildlife Federation (NWF) offers several noteworthy programs. Through its Backyard Habitat Program, you can encourage individual community members to certify their backyards as places for wildlife to find food, water shelter and places to raise young. The cost is \$15 and the application is easy. For details visit www.nwf.org/backyard/certify.cfm.

NWF also offers a Community Certification Program. Earning certification for your whole community as a wildlife habitat requires a certain portion of your community to have their backyards certified under the backyard habitat program. Requirements are based on community size, with larger communities having to do more. In a high-rise? No problem. NWF will work with you. Find out more at www.nwf.org/community.

Pay Audubon International's annual membership fee of \$250 and you become eligible for some prestigious environmental awards. Audubon's Environmental Stewardship Award is a communitywide initiative in which you choose three environmental improvement projects in one year and report results. Your community can choose from five environmental tracks: wildlife, water, outreach education, eco-efficiency and community. For example, you could choose to plant gardens for wildlife, clean up streams, recycle or improve building energy efficiency.

Audubon's Neighborhood for Nature Award requires that your community establish a neighborhood Audubon Committee, complete the neighborhood assessment and environmental plan and report on at least one project in each environmental track mentioned above. For details, visit www.auduboninternational.org/programs/PartnersforEnvironment/APE%20Neighborhoods.pdf.

Tree City USA—a designation by the Arbor Day Association in cooperation with the USDA Forest Service and the National Association of State Foresters—provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs. Larger communities can earn the Tree City designation on their own. Smaller communities can work with a local municipality to encourage it to take the necessary steps to qualify for the designation. For details, visit www.arborday.org/programs/treeCityUSA/about.cfm.

As mentioned in the discussion about obtaining assistance from architects, the Leadership in Energy and Environmental Design (LEED) Rating System may be an option for new or existing buildings.¹²⁶ For new buildings, LEED is an ecology-oriented building certification program of the U.S. Green Building Council (USGBC). For existing buildings, LEED provides tools association leaders need to have an impact on their building's performance and allow for LEED certification of that building.

LEED concentrates its efforts on improving performance across five key areas of environmental and human health: energy efficiency, indoor environmental quality, materials selection, sustainable site development and water savings.

LEED rests on a collection of special rating systems that apply to all kinds of structures, including schools, retail and healthcare facilities. Rating systems are available for new construction and major renovations as well as existing buildings. The program informs and guides all kinds of professionals who work with structures to create or convert spaces to environmental sustainability, including architects, real estate professionals, facility managers, engineers, interior designers, landscape architects, construction managers, private sector executives, and government officials.

On its website, the USGBC says that LEED defines "a nationally accepted benchmark for the design, construction, and operation of high-performance green buildings" and "provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance."

LEEDs ND (Neighborhood Development), still a pilot program, may turn into something bigger soon. For more information, visit www.usgbc.org/DisplayPage.aspx?CMSPageID=148.

Earthcraft House is an earth-friendly certification program that goes beyond energy efficiency to areas such as healthy house, indoor air quality, recycling construction waste and using recycled materials in the home construction process. Having gained greater acceptance than LEEDs in Georgia, it is expanding throughout the Southeast. Find out more at www.earthcrafthouse.com/About/newhomes.htm, www.earthcrafthouseva-sf.org/ and www.earthcrafthouse.com/Find-builder/regional.htm/.

Win the Hearts of the Majority

Assuming your community's membership is a busy, skeptical and educated group, you will want to persuade your community that green is the right way to go. Avoid any approach

that seems as though you are forcing green down your community's throat. For example, the green fanatic, seeing you throw your plastic fork in the trash bin, takes it out, goes after you with it, cleans it off, and places it into the recycling container—and probably alienates everyone witnessing this scene. *Influencer: the Power to Change Anything* is a great resource in the CAI bookstore at www.caionline.org to help persuade your residents to be more green.

If you—or your board—push and shove a green agenda upon the community's membership, you may find that your great ideas are perceived as dictates rather than green opportunities. Consequently, the community can become quite hostile to you or the program. For example, if you mail those "how to save money" tips for saving water to members, it is possible that could blow up in your face. Members could say, "Who are you to tell me I can't take a 45-minute hot shower if I want; this is America for goodness sake."

To obtain the results you want:

Reciprocate. People tend to return a favor, so give first. Thus, you gain acceptance by providing members with giveaways such as "Think green. Be green" bumper stickers or reusable canvas grocery bags. Your membership will appreciate these tokens of your interest. Consistently reward members who already are doing little green things with kindness, appreciation and community-wide recognition.

Show commitment and consistency. Do not push recycling if you do not recycle yourself. Do not promote car pooling and using energy-efficient fuels if those are things you never do.

Gain commitment and consistency. People who commit in writing or orally are more likely to honor that commitment. Make a portion of your website a major appreciation section to the members who have signed up for the native landscape planting activity you planned. If they sign up for one thing, they may well be part of your next green activity.

Give social proof. People will do things they see other people doing. As much as we hate to admit it, conformity makes a great persuader. So, if your community is not there yet, get your staff involved in it, and then bring members into the idea.

Be likeable. People are most readily persuaded by people they like. The success of Tupperware stemmed from that simple fact. Let people feel good about the green work they do. Remind them how important you truly believe their efforts are.

Use scarcity. Let it be known that the community gave out its first 100 reusable shopping bags quickly, and that the next batch is also expected to be snatched up shortly after arrival. Offering free native trees to the first 25 respondents monthly for four months should ultimately result in more sustained community interest than offering all 100 trees in one month.

Regardless of the tactics you use, feel good and be open about them. Aim your green messages to influence opinions and behaviors of your community members. Be completely truthful. When you can, produce an emotional response from your members in addition to the rational response.

Never take the stance that you are right and your community members are wrong. You are not better than they are because you recycle and they do not. You have no right to be smug when you wear clothes produced from local cotton you have woven by hand,

whereas they shop out of state for international pre-made. You are not a better person because you turn up your nose at cheeseburgers and French fries. If self-righteousness is your attitude, then you are the green fanatic.

Seeing the Face of Your Green Community

Communities should show pictures and exemplify positive actions of local green-minded people, whether they are members of the staff or the community. Communities should highlight their green homeowners and staff in their newsletters, websites and other communications. Nothing expresses the importance of going green more than showing its human face. See what other community members, leaders and staff are doing by going to CAI's Community Green website at www.caigreen.org. Better yet, go to the website and provide your own green stories in the "My Green Community" section for others to read.

SECTION 3

Energy Management

Many options are available to community associations to improve energy use and reduce their impact on the environment. To evaluate energy management, the focus here is on the use of energy saving products and equipment. While new energy-saving products and equipment continue to be developed, a number of viable options already are available. (See section 2 for more specifics.)

Solar/wind energy. Photovoltaic cells can harness the sun's energy directly for electricity generation within a community or connected to the power grid. Energy from the sun and wind is suitable for heating spaces, pools and spas and general water heating.

Lighting. Buy or convert to fluorescent lamps and bulbs, which are four to five times more efficient than incandescent bulbs. Harvest daylight by locating workstations adjacent to windows. Use DaySwitch™ on light switches, which employ a photo-sensor to measure daylight levels and send a signal to a microcontroller that switches lights on and off. Replace inefficient exit signs with high efficiency light-emitting diode (LED) exit signs, which operate 24 hours-a-day and have lower maintenance costs due to their extended life.¹²⁷

Appliances. An array of Energy Star™ appliances—clothes washers, dehumidifiers, dishwashers, refrigerators, air conditioners and more—are certifiably energy efficient. In commercial kitchens, use microwaves whenever possible instead of ovens. Use a programmable thermostat. Install a tankless on-demand water heater. Use low flow showerheads in community buildings.

Windows. Specify Energy Star rated windows and doors. Close window blinds and curtains on summer days. In winter, close curtains at night to capture passive solar heat. For large windows in direct sunlight, install UV protection window film.

Roofing materials. Photovoltaic roofing materials generate electricity whenever the sun shines. Reflective roofing products reduce the temperature of the roof, minimizing heat transference to a building during warm summer months. A green roof replaces traditional flat (built-up) roofing with a lightweight, living system of soil, compost, and plants. The resulting thin, green skin atop a building filters rainwater and some of its pollutants. The plants produce oxygen to help clean the air. A green roof also reduces a building's heating and cooling costs, acting as a form of insulation.

Office equipment. To dramatically reduce carbon-dioxide emissions, use long-lasting lithium-ion batteries instead of AA or AAA batteries to power small electronics. Remove carpeting, which emits carbon-dioxide, and install other flooring products such as tile. Use recycled paper. Use a laptop and not a desktop computer to cut energy use by as much as 80 percent.

Stay Informed

Making buildings greener takes a commitment—to yourself, your family, your community and the world. More than that, it is a learning process. As exciting new technologies, products and scientific breakthroughs constantly emerge, staying educated on the

hows—as well as the whys—of maintaining green buildings is the best way to ensure your efforts are as effective and beneficial as possible. Many resources from other organizations offer great ideas for energy management.

The American Society of Heating Refrigeration and Air Conditioning Engineers offers a 105-page publication about green-sustainability practices in buildings, including theaters, health facilities, athletic or recreational facilities and even dedicated outdoor air systems. You can review or download the entire document at www.engineeringforsustainability.org/docs/greentips_2006.pdf/.

A 2008 study indicates that LEED certified or the Energy Star labeled buildings outperform their non-green counterparts in occupancy, rental rates and sale prices. As an association leader, you can hire a professional energy auditor to determine ways to reduce your buildings' energy consumption. For more information, go to the Department of Energy's consumer website at www.eere.energy.gov/consumer/your_home/energy_audits/index.cfm/mytopic=11180. Also, the Energy Star website, www.energystar.gov, is a treasure trove of information about appliances, products, manufacturers and recommendations.

The payback from a building's energy savings can come quickly. Consider that you can recoup the cost of an Energy Star programmable thermostat in less than a year, a heating & cooling system tune-up in nine to 18 months, and professional sealing of air leaks and ducts in less than two years.¹²⁸

For comprehensive information about the benefits of compact fluorescent light bulbs, visit the Changing One Billion Light Bulbs website at www.onebillionbulbs.com.

SECTION 4

Transportation Management

To plan and organize green transportation management, begin by conducting a review of relevant existing facilities and programs that concern the transportation alternatives within and near the community. Select a person or form a team that is responsible for the development of the transport plan. Then establish monitoring and evaluation procedures. Include three overall principles in your planning process:

- Encourage the modal shift from private cars towards public transport and non-motorized or environmentally friendly modes of transport.
- Avoid or reduce unnecessary or undesired mobility.
- Promote good accessibility to local amenities.

A sustainable community transportation system should:

- Promote the owners' selective and rational use of private cars with a preference for clean, quiet, energy-efficient vehicles powered by renewable or alternative fuels.
- Facilitate access to a regular, frequent, comfortable, modern, competitively priced, well-linked network of public transportation.
- Increase the share of non-motorized transport (walking and cycling).
- Make the most efficient use of land.
- Be actively managed in an integrated manner with the participation of all the stakeholders.
- Have short, medium and long-term objectives with an effective monitoring system.

Promote the establishment of a consistent and cooperative development plan at both the community level and on a sub-regional scale. Encourage the participation of stakeholders at all key stages of development and the implementation of the transportation plan. Developers of new associations, particularly master associations, should try to control urban sprawl and plan compact, rather than dispersed, settlement patterns to minimize trip lengths and promote sustainable modes of transport.

To maintain high population densities in the central district area, public transport services should be improved and prioritized over the construction of ring roads, also known as beltways. However, at least one ring road is required to prevent heavy-duty vehicles from crossing the central district area.

Locate new residential developments on sites available in, or close to, built-up areas, such as along public transport corridors, where public transport can provide a viable alternative to the use of private cars. In large development areas, modal interchanges for public transport, walking, and cycling need to be provided.

Make efforts, in all districts of large urban areas and in smaller towns, to keep a balance between housing, jobs and services by proactively implementing measures to ensure mixed-use areas.

Design residential areas to take into account walking distances from dwellings to bus stops and other current or future public transport facilities. Amenities such as supermarkets, health, educational or leisure centers ought to be located within easy walking or cycling distances.

Residential areas should also be well connected to high activity centers and public areas with direct cycling and pedestrian routes in addition to an efficient public transport system. Comprehensive cycle and pedestrian networks should be emphasized in any large association design.

Encourage mobility in the community with attractive services for alternatives to private cars. Home-to-work, work-to-school and school-to-home trips (the most frequent urban trips) are done mostly by car. The involvement of all involved parties (such as parents groups, student bodies, local government and transport companies) is essential in building a successful mobility plan. Encourage people to live close to their workplace, decrease the distances traveled daily, and adapt their mobility habits to the mobility plan (such as using bicycles for distances less than two miles).

Help owners of companies create their mobility plans by providing them with practical information and tools. Among items they might appreciate seeing are local transport plan regulations, local practices, information leaflets, or even customized solutions for employee groups within companies.

Explore possible agreements between the public transport authority and the operators to propose attractive fares for community members. Consider the governance issues, especially in terms of parking regulations. For example, legal problems may arise from imposing parking restrictions such as for resident-only spaces. Parking should be part of a global transport policy, allowing for the coordinated and efficient use of all modes of transport—public transport, private vehicle, bicycle, walking—and should be linked to the association's planning policy.

In the development process, parking should be considered as an element in a wider transport and access policy. As part of a general traffic management policy, prudent parking policy could release central road space for other users, particularly pedestrians and cyclists.

Because parking in residential areas is hazardous and undesirable in other ways, plan to at least separate parking space from public space. Impose such design restrictions during early layout phases of new associations. At the same time, strongly encourage the inclusion of cycle storage space.

Consider the applicable governance, especially the possibility of the association's acquisition of cleaner vehicles and maintenance equipment. Include alternative fuel and electric vehicles, mowers and power tools. Invest in a bicycle or clean vehicle fleet for association personnel and work-related transportation for association employees.

Promote car-sharing and car-pooling, remembering that such practices require a change in the habits of potential users. Show your commitment to car-sharing and car-pooling schemes by including useful information on the association's web site, and perhaps in concert with adjoining associations and local governmental entities. Car-pooling should be managed by a specific person or committee able to solve individual problems.

A cycling policy should be an element of a community transportation policy aimed at reducing the market share of private motorized traffic (modal shift). Consider cycling as a viable mode of transport and strive to make it one of the first modes of transport within the local authority.

Set up an integrated plan and implement groups of measures step-by-step because single measures only have a limited effect. Change priority rules for private motorized traffic, favoring cyclists over private motorized traffic when and where possible.

Plan the improvement of existing infrastructures and the realization of new ones, the ultimate aim being to build a comprehensive network that is interconnected (without breaks), safe and comfortable. Involve local stakeholders—including cyclists, drivers and other road users—in the preparation and implementation of cycling and pedestrian measures. Coordinate with neighboring associations and local authorities to find a joint integrated approach for a whole area, not limited by association boundaries.

Wherever possible, redistribute the roadway between cars, public transport, cyclists and pedestrians. Increase all road users' awareness of each other through signs and road markings. Use all possible methods to develop the cycle network and improve the condition for cyclists, including their security and comfort. Often, that means creating cycle paths instead of cycle lanes.

Use traffic-calming or living street measures, such as the establishment of lower speed limits. In residential areas of the association, give priority to pedestrians and bicycles, and discourage through-traffic.

Establish well-equipped parking facilities and bike shelters for cyclists to minimize theft. Equip spaces reserved for bikes in neighborhoods, commercial centers and schools with racks, bollards, hoops and other support devices. Consider making bicycles available free of charge at different points within the association.

Existing association roads must be regularly maintained, repaired and upgraded by removing architectural barriers from all pavements. Due to associations' limited budgets, such measures should be properly coordinated to save financial resources.

Connect cycling and pedestrian routes to local recreational areas. Cyclist and pedestrian facilities requirements (such as bike racks) should be considered and included in these areas.

For school mobility plans, have children picked up by foot and/or by bike, organized along with the school administration and teachers, parents (voluntary collecting and walking of the children in turns), and the police or city staff (safe road crossing, technical rules, marketing support). Further involve schools by organizing specific campaigns for children, and raise awareness among parents about safety and health issues related to school journeys.

Create an environmentally concerned logo/sticker that can be awarded to owners using alternative transportation as an incentive to participate in such measures. Additionally, an association contest can be organized for awarding the city's mobility plans best initiatives.

Regularly publish articles in local publications, especially your association's newsletter, about your progress in implementing the association's transportation plan and achievements in terms of traffic reduction or other benefits in this regard. Consider creating a specific section the association's website concerning urban planning and sustainable mobility aspects so that citizens can receive up-to-date information about the development of their city. Emphasize such benefits as improved air quality, reduced noise, and the modal shift in favor of more sustainable modes of transport. In your promotional efforts, make use of already available resources, including city maps that

provide information about the public transport network, cycling routes and mobility services.

Try to influence nearby neighborhoods and associations that might be interested in teaming up with your association on the mobility plan by:

- inviting representatives to the meetings of the organization developing the plan
- including them in the test measures
- carrying out door-to-door awareness-raising actions
- conducting qualitative surveys
- polling, managing and launching best practices for residents

SECTION 5

Waste Management

The average person generates 4.5 pounds of waste each day, according to Waste Management, Inc. Preventing waste in the first place is usually preferable to any waste management solution. When prevention is not an option, and donating the item for reuse or repair is impractical, consider recycling for the recovery of metals, plastics, glass and other materials. Check out your state or municipality websites for a government-sponsored program, or Google "recycling in (your area)."

How can you reduce your daily waste?

- When shopping, select products with minimal packaging.
- Buy items in bulk.
- Instead of using the grocery store's plastic bags or paper sacks, bring your own reusable tote bags.
- Use rechargeable batteries.
- Use cloth napkins instead of paper and silverware instead of disposable plastic ware.
- Refill water bottles from gallon containers, or install a filter on faucets to directly fill water containers.
- Select durable products; they may cost more, but they will last longer and save in the long run.
- Choose recyclable products and packaging, and then be sure to recycle them.

What items can be recycled?

- Compact Fluorescent Light bulbs (CFLs), using special kits available from home repair stores and some trash removal companies
- Device and car batteries
- Electronics and computers
- Glass, including bottles and jars
- Aluminum cans and containers
- Paper, including newspapers, magazines, office paper and cardboard
- Yard trimmings, including grass, leaves and shrub and tree clippings
- Used motor oil
- Food waste
- Appliances, including stoves, refrigerators, washers and dryers and washing machines
- Vehicle carcasses

According to the Environmental Protection Agency, each year Americans fill a convoy of trash trucks reaching halfway to the moon.

What's in our Trash?	
38 percent	Trash
18 percent	Lawn trimmings
8 percent	Metal
8 percent	Plastic
7 percent	Glass
7 percent	Food waste
14 percent	Other waste

Imagine, if we recycled everything that could be recycled, that convey of trash trucks would be long enough only to reach the next landfill. The EPA has set a national goal of reducing and recycling 25 percent of our waste. What is your community association doing to achieve that target?

A Growing Web of Resources for Managing Waste

Fortunately, more and more federal, regional and local government agencies, manufacturers and retailers, trade associations and nonprofit environmental groups very much want to help you manage waste. For example, manufacturers and retailers take different approaches to give you several options to donate or recycle your electronics, such as:

- Offering take-back, mail-in, or trade-in programs
- Supporting local organizations that collect equipment
- Hosting collection events at retail locations
- Supporting local recycling events with cities and municipalities

Comprehensive websites offering details about such programs, free publications, posters and links to yet other websites are only a click away for anyone with Internet access.

Waste Reduction and Recycling

- *The Consumer's Handbook for Reducing Solid Waste*, www.epa.gov/osw/wycd/catbook/index.htm, describes how consumers can reduce their garbage by making environmentally aware decisions about products and packaging.
- *Moving Out, Moving In: Making Environmental Choices When You Move*, www.epa.gov/osw/wycd/catbook/index.htm, suggests environmentally safe alternatives to throwing away unwanted "junk" and shows consumers how to make smart, informed decisions when purchasing new items.
- *Recycle: You Can Make a Ton of Difference*, www.epa.gov/osw/wycd/downloads/recy-ton.pdf, introduces the national recycling campaign by providing an overview of solid waste problems and recycling solutions.

Household Hazardous Waste

- *Be Smart* (Poster), www.epa.gov/osw/conserves/materials/pubs/hhw-con.pdf, lists some of the household products that contain ingredients that can harm you and your family; it is also available in Spanish, www.epa.gov/osw/conserves/materials/pubs/sp-hhw-con.pdf.
- *Sure your home is clean...but is it safe for your family?*, www.epa.gov/osw/conserves/materials/pubs/hhw-safe.pdf, provides guidance to safeguard your family, your home, and your community from harmful products and ingredients commonly used for cleaning, carpentry, auto repair, gardening and other tasks; also available in Spanish, www.epa.gov/osw/conserves/materials/pubs/sp-hhw-safe.pdf.

Household Medical Waste

- *Protect Yourself, Protect Others: Safe Options for Home Needle Disposal*, www.epa.gov/osw/nonhaz/industrial/medical/med-home.pdf, briefly describes disposal options for people who use syringes and other medical sharps at home. Contains information

on six types of services available to home users: drop-off collection sites, community household hazardous waste collection centers, residential "special waste" pickups, syringe exchange programs, mail-back services and home needle destruction devices; it is also available in Chinese, www.epa.gov/osw/nonhaz/industrial/medical/med-chinese.pdf.

- *Handle with Care: How to Throw Out Used Insulin Syringes and Lancets at Home - A Booklet for Young People with Diabetes and their Families*, www.epa.gov/osw/education/pdfs/han-care.pdf, offers easy directions and illustrations on how to protect family members and waste handlers from injury while keeping the environment clean and safe.

Lawn and Garden

- *Composting*, www.epa.gov/osw/conserves/rrr/composting/index.htm, discusses and defines composting, what compost can be used for and other related topics.
- *GreenScaping: The Easy Way to a Greener, Healthier Yard*, www.epa.gov/oppfeed1/Publications/catalog/greenscaping.pdf, offers guidance for consumers on changing their landscapes to green spaces, saving time and money while protecting the environment.
- *Used Oil for Recycling/Reuse: Tips for Consumers Who Change Their Own Motor Oil and Oil Filters*, www.epa.gov/osw/wycd/downloads/recy-oil.pdf, provides step-by-step instructions for changing motor oil, recycling used oil, and changing and recycling used oil filters; it is also available in Spanish, www.epa.gov/osw/inforesources/pubs/espanol/f94008s.htm.
- *You Dump It, You Drink It—Recycle Used Motor Oil*, www.epa.gov/osw/conserves/materials/usedoil/campgn/en-dumpbr.pdf, provides information for do-it-yourselfers and consumers on the impacts of improperly disposed oil, as well as guidance for proper disposal; it is also available in Spanish, www.epa.gov/osw/conserves/materials/usedoil/campgn/sp-dumpbr.pdf.

Computers and Other Electronic Products

- *Donate or Recycle Electronics: eCycle*, www.epa.gov/osw/partnerships/plugin/pdf/donate.pdf, briefly describes the EPA's campaign to encourage the reuse and recycling of electronic products such as computers, monitors, printers, televisions and cell phones.
- *Recycle your cell phone. It's an Easy Call*, includes information from leading cell phone manufacturers, service providers and retailers to increase the awareness and recycling rates for cell phones and Personal Digital Assistants (PDAs), www.epa.gov/osw/partnerships/plugin/cellphone/index.htm; it is also available in Spanish, www.epa.gov/osw/partnerships/plugin/cellphone/spanish/index.htm.
- *Plug-In To eCycling*, www.epa.gov/osw/partnerships/plugin/index.htm, is the website of a partnership between the EPA and consumer electronics manufacturers, retailers, and service providers that offers more opportunities to donate or recycle used electronics.
- *E-cycling Central*, the Electronic Industries Alliance's Consumer Education Initiative, www.eiae.org/, helps identify reuse, recycling and donation programs for electronics products by state.
- *My Green Electronics*, www.mygreenelectronics.org/, from the Consumer Electronics Association, is a resource for consumers wishing to purchase green products or searching for local opportunities to recycle or donate used electronics.

- *TechSoup*, www.techsoup.org, the technology place for nonprofits, offers a comprehensive body of information for those who would like to donate hardware, those who would like to acquire recycled hardware, and refurbishers.
- *If It's Rechargeable, It's Recyclable*, www.rbrc.org/consumer/, from the Rechargeable Battery Recycling Corporation, can help you recycle portable rechargeable batteries commonly found in cordless power tools, cellular and cordless phones, laptop computers, camcorders, digital cameras, and remote control toys. Search for collection sites by zip code.
- *Learn More about eCycling Programs Where You Live*, www.epa.gov/osw/consERVE/materials/ecycling/live.htm, includes specific information about regional and State electronics recycling programs; some of the links are to state pages pertaining to waste management, solid waste or municipal solid waste.
- *Electronics Recycling Web Portal*, www.electronicrecycling.org/Public/default.aspx, contains helpful information and useful links from the National Center for Electronics Recycling, a non-profit organization dedicated to the development and enhancement of a national infrastructure for the recycling of used electronics in the United States.
- *Where Can I Donate or Recycle My Old Computer and Other Electronic Products?*, www.epa.gov/osw/consERVE/materials/ecycling/donate.htm#local, contains invaluable links to local programs, manufacturers and retailer programs, and government-supported donation and recycling programs.

SECTION 6

Building Management

Green building management requires attention to a number of different variables. Among areas association managers and community leaders must consider are sustainable practices, water efficiency, energy and atmosphere, materials and resources, and indoor air quality.

Sustainable Sites

All sustainable building management practices have the potential to make a positive impact on the environment, but no other component impacts the local environment as much as sustainable site operations. Site management components include hardscape and landscape, as well as exterior building practices.

Hardscape strategies. Community leaders should seek to develop procedures that minimize environmental impact in areas such as painting and waterproofing of building exteriors, snow removal and pest management. Particular attention should be paid to chemical runoff and its effect on local plants and water tables.

Natural materials such as sand are preferable to chemical ice-melting products. However, keep in mind that excess sand accumulation should be collected at the end of the season to avoid sediment in storm sewer systems.

Landscape strategies. A sustainable landscaping philosophy minimizes the use of chemicals and irrigation systems. Managers and community volunteers should seek to use native plants that will thrive on local rainfall without additional irrigation, and avoid fertilizers and pesticides that degrade local water bodies.

Rain water runoff. The control of storm water is a major component of site sustainability. Buildings reduce the area of exposed permeable ground available to absorb rainfall. Roofs and paved parking areas act as catch basins, collecting rainfall and contributing to soil erosion. Outdoor parking areas can introduce oil, antifreeze, and other automotive chemicals to the water table through uncontrolled rainwater runoff.

Heat island syndrome. Dark colored anti-reflective surfaces on roofs and parking areas act as heat radiators and absorbers of solar energy, raising the temperatures of the immediate environment. This causes the expenditure of additional energy to cool the interiors of building located within this "heat island."

The use of vegetation or reflective materials on roofs significantly reduces the heat island syndrome. The resulting energy savings in the building's HVAC operations can be considerable.

Light pollution management. Outdoor lighting should be carefully controlled and focused to minimize the impact on nocturnal ecosystems. Motion sensors help by limiting security lighting. Additionally, you should consider ways to minimize lighting for architectural effect.

Water Efficiency

The goal of the board of directors and the association manager should be to reduce

public water consumption in buildings consistent with the efficient operation of building equipment and occupant use.

Use nonpotable water. Wherever possible, sources of nonpotable water such as collected rainwater or well water should be used for non-consumption requirements.

Reduce consumption. The installation of low-flow plumbing fixtures such as shower heads and faucet aerators should be encouraged. Low capacity toilets can dramatically reduce demand on the public water supply. Lowering consumer consumption also reduces the energy demands of water treatment plants.

Energy and Atmosphere

Energy costs are a major contributor to the expenses of building operations, and the creation of that energy has a corresponding environmental impact.

Use commissioning. All community leaders should survey building operations with the goal of maximizing energy efficiency. In addition to reducing consumption, commissioning of building systems and practices can extend the useful life of equipment and reduce maintenance costs.

Reduce CFCs. In older buildings, leaking chlorofluorocarbons (CFCs) in air-conditioning equipment contributes to the degradation of ozone in the atmosphere and absorbs infrared-radiation-causing greenhouse effects. Replacing older CFC based equipment with modern systems also results in more efficient energy use.

Turn to sustainable energy technologies. Solar and wind energy technologies can significantly reduce the demand on public utility consumption and result in overall, long term cost savings. Augmenting public utility energy with sustainable sources can provide benefits for even smaller buildings.

Use regeneration. Recapturing the waste energy in equipment exhausts through heat exchangers or turbines provides an alternative source of power without adding stress to the environment.

Consider consumption reduction strategies. Energy conservation often can be achieved with very little capital outlay. Replacing incandescent fixtures with fluorescents will dramatically reduce the kilowatt costs of any building. Community associations should select fluorescent bulbs with the lowest mercury content possible because of disposal concerns. The use of occupancy sensors to control lighting when areas are not in use is another inexpensive technique to reduce consumption.

Materials and Resources

The goal of these strategies is to reduce the amount of landfill products resulting from building operations, and minimize the environmental impact of products used in those operations.

Sustainable materials. Community leaders should remain aware of the health and environmental benefits of all materials purchased for use within and around the building. Products that use recycled materials reduce the demand on natural materials as well as the amount of landfill waste. Additionally, the use of local products reduces the impact of transportation.

Waste reduction strategies. The Environmental Protection Agency has established three strategies for reducing waste—source reduction, reuse, and recycling. Source

reduction advocates the elimination of packaging and other non-recyclable material. Recycling removes used products from the waste stream for remanufacturing, either into new versions of the existing product or new products. It reduces the demand on natural resources and can provide an income to the building. Reuse of products that are serviceable but no longer needed by the building also reduces the waste stream and the demand on natural resources.

Indoor Air Quality

Indoor air quality directly affects the health of occupants, as well as energy demands and environmental contamination.

Ventilation strategies. Adequate indoor ventilation is necessary to protect occupants from tobacco smoke (if allowed), carbon dioxide and particulate matter. Air filtration can control exposure to bacteria, pollen, dust, animal dander, and chemical emissions from carpeting, paint and wallpaper.

Cleaning products. The selection of cleaning products affects not only the indoor building environment but the outside environment through the waste stream and sewage system. Associations should seek products that are low in volatile organic compounds (VOC), phosphates, and nitrates.

SECTION 7

Land-Use Management

The outcome of land and lakes best practices is to establish a degree of ecological health and sustain it over time. That requires human assistance.

Green land and lakes management can reduce development sprawl on a community's land area by layering activities simultaneously on a single site to make the most of an area. For example, a school may also be used as a community center, an interpretive trail as a butterfly habitat, and a rooftop as a garden. Sometimes, a meadow may temporarily become a parking lot. Consider sharing activities on one site at differing times of day or different days.

Green land-use management also aims to increase the value of outdoor space. Start by looking for places to remove concrete or paving, in favor of wooded areas that can accept or even store rainwater. Plant deciduous trees on the western side to shade structures in summer while allow sunlight to warm the structures in winter.

Establish a prudent diversity of plant species to make the land more inviting to animals. Selected wisely, plants can provide songbirds and animals with food, shelter and places to raise their young.

Both your community members and wildlife will appreciate the creation of forested areas, which are possible even in urban areas. Create walkable spaces without access to cars. Consider seating, drinking fountains and restrooms for those walkable routes.

Maintain land and lakes sustainably. A major step is to avoid blanket spraying of chemicals, particularly when a natural agent is available. For example, using ladybugs as predators to kill aphids can be greener than using traditional pesticides if ladybugs require less personnel maintenance over time and are environmentally friendly. The Bio-Integral Resource Center, www.birc.org, provides resources and information on integrated pest management practices.

Always consider the long term. It may be cheaper to maintain a large grass lawn this year than create a forest there, but given the annual costs to irrigate, aerate, mow and replace that lawn over time, it could be more sustainable to allow an area to grow on its own into a woodland or desert. Certainly, the natural alternative will ultimately minimize maintenance and replacement costs.

Going natural may not always come naturally, however. First, start to plan what you could accomplish. Hire professionals to help you or find professional volunteers in your community to inventory and analyze the community's land and lakes areas.

Tell them to consider simple solutions to make big improvements. This means more than just hiring a landscape architect. Consider turning to professionals involved in landscape architecture, horticulture, ecology and limnology (the study of lakes). If your community has professionals who would volunteer their expertise, they may make the best professional help.

Understand the dynamics of the living systems in which you work and make the area better for people (e.g., cooler in summer and sheltered from winter winds) and better for wildlife (e.g., improve plant diversity to improve wildlife diversity). This includes concepts such as:

- **Soil management.** Soil forms as rock is broken down by climate, organisms, and vegetation over time. In addition to weathered rock fragments and decaying remains of plants and animals (organic matter), soil also contains varying amounts of air, water and millions of microorganisms. It furnishes mechanical support and nutrients for growing plants. Soil is the basis for establishing plants. Consider your location.
- **Plant selection and planting.** Well-adapted native plant species are superior to introduced species when they provide wildlife food, shelter and places to raise young.
- **Weeding.** This refers to the removal of invasive species. For example, in the southeastern states, the Chinese tallow tree is a noxious invasive species that chokes out preferred native plants, particularly in wetlands. However, in areas to be transformed into forest, you may decide against most weeding to encourage emergence of native plants. Plan to inventory the species at least twice annually to verify that noxious unwanted plants have not sprouted. Before widespread removal, get advice from a horticulturist. The weed you seek to remove today could be the flowering perennial or tree you would want in the future. Typical lawns are not environmentally friendly, so minimize areas of turf, even on the golf course.
- **Watering.** Use prudent watering concepts such as planting native varieties of vegetation, which require less water than non-natives do.
- **Soil enrichment.** Know your soil's content in areas to be planted, but use caution in adding amendments. Your local county extension service will have information about how to take a soil sample and get it analyzed. Still, remember that if you are planting natives from your region, they will most often be acclimated to the soils in your area and require little artificial enrichment. For wooded or forested areas, cultivating will remove beneficial microorganisms and earthworms, which can be more detrimental than leaving soil untilled and planting in spots where nothing is growing. For desert soils, the soil surface needs to remain as it is—relatively compacted—to control wind and water erosion. By contrast, soils in the American Midwest can be improved by loosening to help seedlings germinate; however, except in agricultural situations, such action kills beneficial microorganisms and releases significant carbon.

Maintenance Versus Management

Your overall approach should favor land and lakes *management* techniques rather than landscape *maintenance* techniques. Strive to carefully guard your community's land and lakes as assets.

Consider conservation techniques by returning areas from suburban or urban to forest. Or simply make fairways thinner and return the resulting wider roughs to native vegetation. Similarly, allowing a five-foot swath of land beside pond edges may nurture the return to native vegetation while keeping lawn chemicals from getting into ponds. Give an already existing forested area a boost by planting preferred species welcomed by wildlife.

Maintenance is by rote, but management is understanding that healthy plants, even turf grasses, are best able to resist diseases and pest. Know the good parts of your soil's biology and build upon that. Fertilize conservatively. Create and use compost.

Let nature work its wonders. For example, in some parts of the country, placing corn gluten on turf in February stops crabgrass seeds from germinating. Attract beneficial insects,

including butterflies. Build homes for bats, which can consume enormous amounts of mosquitoes and other bothersome insects.

Remember, your community's land and lakes are valuable. In the typical park or golf course, specimen trees are surrounded by lawn. But you may underestimate the value of understory, those smaller trees, shrubs and groundcovers that would naturally occur under big trees.

The forest canopy reduces solar radiation so the ground does not heat up as rapidly as turf does. The understory provides even more shade, allowing decomposers such as fungi to flourish. This drives the nutrient cycle and provides favorable microclimates for animals, including people. In addition, future trees come from the understory layer. Moreover, replacing lawn with native shrubs and trees in the understory reduces the need for watering, mowing and adding lawn chemicals.¹²⁹ The Million Trees Los Angeles initiative found average annual benefits per tree planted amounted to between \$38 and \$56 per tree planted. Eighty-one percent of total benefits were aesthetic; eight percent, storm water runoff reduction; six percent, energy savings; four percent, air quality improvement; and less than one percent, atmospheric carbon reduction.¹³⁰

The value of larger trees, particularly old-growth forest, stems in large part from their ability to store carbon, even in their soils. Indeed, they continue to absorb carbon dioxide from the atmosphere for centuries.¹³¹ Until recently, conventional scientific wisdom had been that trees take in carbon the first 55 years of their lives; after that, the intake levels off until they die, when substantial carbon is released. But recent studies have found that in forests anywhere between 15 and 800 years of age, the forest absorbs more carbon than it releases.

Also valuable is xeriscaping,¹³² which involves the installation of drought-tolerant plants in a landscape designed for water conservation. Even a densely-planted xeriscape saves enormous volumes of water.¹³³ The most drought tolerant species are the types of plants growing in the woods nearby. No harvesting allowed though: find your native plants at the local garden center.¹³⁴

The green aesthetic for land and lakes management looks different. It looks wild. To some, this means it harbors dangers such as wild animals. Nevertheless, in an increasingly urban and suburban world, urban forests and other areas of wildness or managed areas of native vegetation can be welcomed. For example, gardens built on roofs have been popular in Germany since the 1970s. In the U.S., landscape architects Oehme and VanSweden removed clipped hedges in Washington D.C. public spaces in the 1980s and installed native grasses in their place, softening those hard-edged places. This landscaping style continues to grow in popularity.

Nature's look is not uniform, formal or controlled. Natural areas mature over time, as ugly ducklings over time turn into swans. To speed up the process by planting, exercise caution not to damage the existing soil microorganisms and organisms (earthworms) by disturbing the soil (plowing the soil, turning it over). Plant sparingly. Let leaf litter and dead branches fall where they will. Consider that the weeds coming up today could well be tomorrow's forest, so do not walk or drive upon the area more than is necessary.

Ascetics aside, green land management yields some attractive quality-of-life benefits. Consider that trees' shade can reduce ambient air temperatures by five to eight degrees in the summer.¹³⁵ ¹³⁶ (See Section 1 for more information.)

Another noteworthy benefit is the potential for air-quality improvement. In major cities, trees greatly lessen the need for pollution-control devices by removing tons of ozone, sulfur dioxide, nitrogen dioxide and airborne particulates. Planting more trees in Houston area would make sense because particulate pollution is responsible for an estimated 434 premature deaths in that city each year.¹³⁷ Massive tree planting programs in Mexico City and Sacramento have reduced ozone accumulation.¹³⁸

Moreover, green land management can significantly reduce heating, ventilation and air-conditioning expenses. The shade of a single well-placed mature tree reduces annual air conditioning use two to eight percent (often in the range of 40 to 300 kilowatt hours) and peak cooling demand two to 10 percent (often as much as 0.15 to 0.5 kilowatts).¹³⁹ Trees should be planted on the east and west sides of buildings for greatest energy savings. West shading allows shading during peak demand for energy and highest ambient temperatures. Since air conditioners run more efficiently when kept cool, another way to increase energy savings is to shade the air conditioner.^{140 141}

SECTION 8

Governing Documents

The fully-functioning green community should be supported by the community association's governing documents: the covenants, conditions, and restrictions or declarations (CC&Rs); the articles of incorporation; the bylaws; and the design guidelines, if any have been adopted. To ensure the success of the programs covered in this report, you should pay particular attention to the governing documents to ensure they clearly authorize and uphold the particular green elements being incorporated into the community. It is, of course, easier to work these concepts into brand new documents, but below we will also discuss the additional issues involved in retrofitting the concepts into existing governing documents.

Check local laws. State and local laws, not to mention national laws, are constantly in flux as various jurisdictions respond to the cry for the more efficient use of resources. These laws vary widely from jurisdiction to jurisdiction, so make sure your documents comply with the current applicable laws.

For example, in some jurisdictions solar panels and clotheslines *must* be allowed. In other jurisdictions, sustainable building ordinances may have application to the renovation of structures or new additions. These laws can take a wide variety of forms (from zoning ordinance to statute applicable to condominiums or planned unit developments) and can be present at any or all levels of government—town, city, county, and state.

Check the various Leadership in Energy and Environmental Design (LEED) guidelines or local equivalents. Since first adopted in by the United States Green Building Council in 1999, the LEED Guidelines and other subsequent programs have provided guidance and consistency to people desiring to apply green build standards in various construction and development projects, including new construction, major renovations, homes, retail, and neighborhoods. Under this program, a project can attain one of several LEED certification levels that indicate the extent to which the building incorporates the requirements in the LEED standards.

When seeking LEED certification, ensure that the governing documents track, and carry forward, the program requirements. For example, the association for a mixed-use condominium project recently added provisions to the declaration regarding recycling programs, making provisions for adequate changing facilities for persons desiring to bike to work in the retail portion of the condominium, and assuring that the initial programs and uses were kept in place over time. Although an existing community may be unable to achieve the standards this program sets out, reviewing the LEED guidelines and other green standards can provide invaluable assistance as a starting place for ideas.

Evaluate and revise "stock" use restrictions. Many CC&Rs prohibit clotheslines, solar panels, compost piles, and vegetable gardens; however, in some cases these items may be permitted in limited circumstances. All of these items are essential (and in some cases, easy to accomplish) components of a green lifestyle. If a particular use or practice seems potentially objectionable, consider putting controls into place to neutralize objections while allowing the existence of the green items in certain circumstances. For

example, the design guidelines or declaration can require that clotheslines must be taken down when not in use or may not be in continual use for more than 10 to 12 hours at a time. Vegetable gardens may be allowed if located in a backyard or if the vegetables are also part of a decorative and aesthetically pleasing landscape plan.

Strict adherence to “cookie-cutter” use restrictions should be reevaluated. The restrictions for any community should be tailored to the needs of the community over time, regardless of a desire to go green, and should have the flexibility to be changed with appropriate notice to owners and input from them. These needs can change as the community changes over time.

Track changing technology. Architectural requirements and use restrictions need to be flexible to accommodate changing technology. When dealing with specific items, the CC&Rs and design guidelines should establish a procedure that allows changes to policies and guidelines without the need to obtain owner consents, while providing adequate notice to the owners and occupants who must comply with them. Creating a built-in sunset provision for guidelines or a mandatory review of the guidelines after a specific period of time will enhance the CC&Rs and design guidelines and assist in tracking the evolution of products available to owners.

Such guidelines should specifically state that new technologies and products not available when the design guidelines were initially adopted must be given special consideration in connection with reviewing requests for approval. Variances should be allowed and granted when new products are in harmony with the intent of the design guidelines and the then-current appearance of the development. Considerations for architectural guideline changes may include such simple ideas as allowing an alternative decking material that should not be painted, when all decks are normally painted. These changes may seem minor, but they can have major implications to owners wishing to maintain and improve their property.

The decking suggestion above comes from a real-life problem, where an architectural review committee insisted that an owner paint a new deck they had approved. In the approval, there was no mention of paint and the owner went to great lengths to point out that it was constructed of a wood alternative that would maintain its color and have a longer, useful life with no maintenance. However, the architectural review committee refused to change its mind, and the deck had to be painted. Unfortunately for the owner, painting the wood alternative voided its warranty and created a maintenance obligation (repainting from time to time) that he had intended to avoid.

Painting was not necessary for this deck material, which would maintain its appearance over time (no color change, warped boards, or similar problems) and requiring painting prevented the owner from obtaining help from the manufacturer of the material if there were problems. This material was never imagined at the time the development’s design guidelines were established. Considering the situation, the architectural review committee’s adherence to an old standard was unreasonable, as the reason the real wood decks were painted in the first place was to protect them from the elements over time and to maintain a uniform appearance. Keep in mind that the market’s evolution may include a return to items that merely fell out of fashion and not just the creation of new products.

With respect to landscaping, design guidelines may require use of native and non-

invasive plants in landscaping, including wildflowers. Use design guideline provisions to minimize lawn areas and encourage tree planting. Consult with professional landscapers and arborists to gain valuable input when drawing up reasonable landscape guidelines for a community. The design guidelines should encourage and may even require xeriscaping (water conserving landscape design) to reduce owner and association costs to irrigate the landscaping.

Along similar lines, the design guidelines should prohibit or limit the use of industrial fertilizers and other synthetic lawn care products because these products can adversely affect the surrounding ecosystem. Prohibiting the use of fertilizers may actually save costs related to management of a nearby pond or lake that would otherwise be spent countering the fertilizer's effect on the water (and its inhabitants).

Another worthy idea is to make sure the design guidelines allow driveways and other concrete slabs to be replaced by geoblock or other aesthetically pleasing permeable surface. In many standard CC&Rs, such materials are not addressed or are implicitly prohibited through omission on listings of materials suitable for driveways, sidewalks, and patios.

Create communitywide programs and services. The association can adopt programs to accomplish green goals without creating restrictions and requiring punitive actions for the failure to comply with those restrictions. This is a positive, proactive, and community-building way to adopt green ideas. The framework for programs the association may want to establish, the creation of committees, and authority for their operation should be set up in advance in the governing documents. Programs should be simple and easy to accomplish because the people involved will be volunteers.

A good set of governing documents should provide guidance for setting up such committees. The committee's actions should be well-defined by a board of directors' resolution that creates that committee. This gives the board a way to oversee what the committee does, as well as to rein it in if it goes off course. It also helps the committee to have a clear statement of responsibilities so there is no confusion over what they can do and what they are expected to do. A committee responsible for electronics and cell phone recycling could solicit used computer equipment and other electronics from owners and donate them to charitable groups or undertake any number of other green activities. Other ideas include committees dedicated to administering more general recycling programs, creating a farmer's market on site, and recycling Christmas trees.

Dealing with existing documents. The greatest challenge in changing existing documents is ensuring continuity among the actual improvements and programs put in place, the marketing plans (if any), the way the improvements and programs are intended to work, and the final product. Even when drafting a new development's CC&Rs, some time and energy should be spent considering current trends and putting in the flexibility to change restrictions (or require reevaluation with sunset provisions) to enable the final product to track current market trends and change as necessary. If this concept is missing in existing documents, it should be added, along with the other changes.

Consider performing a "green audit," which would take the form of an intensive look at the existing documents, including the obvious need for changes to use restrictions, the association's authority to enact changes, the ability to set up programs and committees,

and ways to build in flexibility for adjusting to the evolution of trends. This audit can be used to give an owners' committee or advisory group information that would allow them to share potential changes with other owners and give owners a say in the extent of any proposed changes. Having an open process of researching and crafting a final amendment will give owners a feeling of "buying in" to the final product, improving the chances of adopting a proposed amendment.

The issue is also complicated by determining how an amendment can be adopted and if the adoption of such an amendment is possible as a practical matter. In representing an association (or groups of owners) seeking to change a set of existing governing documents, take into consideration that the task is as much a public relations matter as a legal one.

Once the concepts and potential changes are identified through the audit process, the amendment should be drafted for review and comment. This ensures that owners and board members understand how the changes will be worded. Often, a concept is acceptable all around at the concept stage, but once it is reduced to legalese, new concerns can surface. Going through this draft stage eliminates surprises later on.

Appendix

Top 10 Ways to Help Your Community Go Green

1. Educate your board of directors and ask it to adopt a green mission and vision for your community.
2. Promote and support a comprehensive recycling program for your community. Reward best recyclers.
3. Develop and promote architectural review guidelines that encourage regionally-appropriate, drought-resistant indigenous plants. Better yet, encourage returning community and private areas to forest, prairie, desert or dunes—whatever is appropriate to your community. Announce “most attractive native landscape in a member’s yard” in your newsletter. Give the winner a compost bin.
4. If your community is an urban high-rise, find a way to attract hawks to nest, or create a green roof space for members that attracts hummingbirds. Or host a window garden competition. Announce the results to your membership.
5. When it makes sense, purchase smaller fuel-efficient vehicles, including electric or hybrid models, for personnel. Label the vehicles clearly to make a favorable impression with residents and visitors.
6. Install programmable thermostats in community buildings. Establish an HVAC equipment service program. Publish your success.
7. Post a note on each of your paper towel dispensers: “Remember, These Come from Trees.” This message could save up to 100 pounds of paper every year.
8. Install solar heaters and/or heat pumps to supplement pool heating. Install pool covers to reduce heat loss.
9. Develop architectural review committee guidelines that provide some type of incentive, or at least kudos, for adopting LEEDs or Earthcraft practices in a home or building. Promote the construction or the modification with “Earth Friendly House Under Construction/Modification Here” signage. Brag about these members in the community newsletter.
10. Look around for opportunities to inspire your membership. Find a band of brave souls who will champion your cause – your Green Team. Many citizens would love to get involved in this stuff! Publicize the good deeds of your Green Team.

Case Studies

case study #1

Serenbe

Size:	1,000 acres (developing on a maximum of 30 percent; preserving 70 percent)
Age:	Started in 2004
Location:	Chattahoochee Hills, Georgia (20 minutes southwest of Hartsfield-Jackson Airport)
Contact:	Tucker Berta, Director of Communications
Website:	www.serenbe.com
E-mail:	tucker@serenbe.com
Blog:	www.serenbe.wordpress.com
Phone:	(678) 850-3204

Serenbe is a national model for the future of balanced development in the United States—focusing on land preservation, energy efficiency, green building, walkability, high density building, and community living. With a projected 70 percent of future building occurring in the greenfield, Serenbe demonstrates how urban development models can succeed on the edge of a metropolis while preserving a majority of the greenspace. Serenbe’s ultimate goal is to demonstrate how development can accommodate the need for housing with minimal impact on nature. The community’s land plan call for a preservation of at least 70 percent of the acreage, while accommodating as many or more people as traditional subdivision-style development, which would disturb nearly 80 percent.

Serenbe was the first hamlet built in Chattahoochee Hills. The community has private residential homes (currently, approximately 160 residents), commercial space, art galleries, original shops, stables, a 20-room inn with conference facilities, and an organic farm with a community-supported agriculture program and Saturday markets. The community also is home to three thriving restaurants—Blue Eyed Daisy Bakeshop (the nation’s smallest Silver LEED certified building), The Farmhouse (which has received national critical acclaim in *Gourmet* and *Bon Appétit* magazines, and is consistently featured in local publications), and The Hil (owned by executive chef Hilary White, and recipient of national critical acclaim in *Food and Wine* magazine, and the title of Best New Restaurant by *Atlanta Magazine* and the *Atlanta Journal Constitution*). In 2008, the Urban Land Institute awarded Serenbe its inaugural Sustainability Award, the Atlanta Regional Commission honored Serenbe as a “Development of Excellence” with special merit in conservation, and EarthCraft named Serenbe the EarthCraft Development of the Year.

At the height of Atlanta’s suburban sprawl in the mid-1990s, it became apparent that development was headed to South Fulton, just as it had to every other area surrounding Atlanta. Steve and Marie Nygren called upon other landowners in the Chattahoochee Hill Country area, who formed a group called the Chattahoochee Hill Country Alliance. The group’s mission was to protect the land from traditional development while meeting the realistic need for inevitable development.

The group worked with national conservation leaders and land planners to create the overlay plan, which calls for preservation of a minimum of 70 percent of the 40,000 acres while accommodating as many or more people as traditional development would. Serenbe was created as an urban model that promoted walkability and community living, with central post boxes, a small town café that was open by the time the fourth resident moved in, two gourmet restaurants and a cocktail lounge, porches pulled to the street, and other elements to foster community and create a social fabric, all enhanced and enriched by the Serenbe Institute and community programming.

A recent white paper from the Urban Land Institute predicts that approximately 70 percent of future building will be in the greenfield. Traditionally, greenfield development has been linked to urban sprawl. Serenbe demonstrates how greenfield development models can succeed and preserve a majority of the greenspace. Development must occur to accommodate the need for housing, but does not have to occur at nature's expense. This is accomplished by using the basic tenets of new urbanism—dense building around community centers, just like many historic U.S. towns and English villages.

Serenbe demonstrates how to work with nature's gifts rather than against them. Homes within Serenbe, for example, are sited with minimal disturbance of the land and natural terrain, and are placed in relation to the sun for maximum energy efficiency and natural heating and cooling, and windows are placed for cross-ventilation. All structures are built to the strict green building standards mandated by EarthCraft Home.

In addition to land conservation and green building, Serenbe promotes clean technologies and green practices, such as recycling and composting, alternative fuel usage for maintenance vehicles, geo-thermal heating, and the farm-to-table movement with a partnership between the Serenbe Organic Farm and Serenbe's three restaurants.

Addressing the planet's shrinking water supply is of utmost importance to Serenbe. The community exemplifies several of the water conservation practices President Obama promises to promote in his administration: improved technology for water conservation and efficiency via water-smart appliances such as dual-flush toilets, wastewater treatment using bio-retention and constructed wetlands, minimal landscaping, and storm water treatment via natural buffers. The monthly water bill for Serenbe as a community is 25 percent lower than the national average.

Serenbe is also a model for urban renewal, showing a community that promotes walkability, community living and land preservation can succeed, whether it's an infill or greenfield project. City planners and managers are visiting Serenbe to see how to create an urban setting, with walkability, retail, restaurants, galleries, and the feel of a historic community. Many cities around the nation were affected by urban sprawl, and Serenbe gives these places a new model for success and rejuvenation, providing hope to struggling suburban areas.

case study #2

3400 Malone Condominium Association, Inc.

Size:	60 Residential Units and 4 Commercial Units, 2.016 acres and a minimum annual operating budget of \$125,160
Age:	One year
Location:	Chamblee, DeKalb County, Georgia
Board Size:	Three members
Contact:	Larry Davis, Board of Directors of 3400 Malone Condominium Association, Inc.
E-mail:	larryd@lkdavis.com
Type of community:	Mixed-use condominium association

The 3400 Malone Condominium Association, Inc. project proves that even small communities can go green. The association was one of the first in the Atlanta area to comply with the U.S. LEED green building certifications. The first story of the 4-story condominium building includes all of the four commercial units, along with some of the parking spaces. The parking spaces continue onto the next level. The second through fourth level of the condominium building are residential floors.

case study #3

The Kiawah Island Community Association

Size:	4,115 properties
Age:	32 years
Location:	Kiawah Island, SC
Board Size:	Seven members
Contact:	Joe Bunting, CMCA, AMS, LSM, PCAM
E-mail:	joe@kica.us
Type of community:	Large-scale community association

Kiawah Island is a 10,000-acre barrier island community south of Charleston, S.C., located between the Atlantic Ocean and the continental United States. Beginning in 1999, the association started strategic planning, based on a value system. Under the strategic plan, updated annually, the association's mission and vision statements captured the values important to members. One of the seven values is: "Stewardship of Natural Resources. We are driven to protect and enhance the natural environment that makes Kiawah Island such a special place. Living in harmony with wildlife enriches members' quality of life." And the association's vision indicates, "Kiawah Island's natural beauty...makes it an excellent place to live and invest. The association is committed to the preservation and active stewardship of the island's natural resources so that it remains recognized nationally and internationally as a special place, indeed a place like no other." This top-down commitment gives new property purchasers easy access to what the association's membership values.

Interestingly, the association's covenants, written in 1976, have little to say about land conservation and preservation. They indicate general restrictions about environmental control for waterfront and woodland areas. For example, they state the need to "preserve the natural appearance and scenic beauty of the property and to provide a cover for animals which habitually move along the marsh edges," but they indicate that this will be accomplished solely by limiting the clearing that can be done on lots. Since that time, board resolutions for best practices land management that association members could use on their properties and a new standard procedure for staff's land and lakes management were added.

The association did two things to make conservation a priority. First, the Kiawah Island Conservancy was chartered as a non-profit, section 501(c)(3), grassroots organization by association members in 1997 to preserve the natural habitat of Kiawah Island. It is a separate organization from the association. The conservancy has the capability to hold land and conservation easements, and, as such, it acts as a land trust. In this regard, it is a member of the Land Trust Alliance and has adopted and subscribes to the Land Trust Standards and Practices as a guide for its organization and operations. Since its inception, the Kiawah Conservancy has preserved 17 properties in the community that total 300 acres of barrier island habitat.

Second, the association began contributing to the conservancy. According to the community's 2006 members' survey, 83 percent of the respondents cited the island's natural environment as one of the top three reasons they purchased property in the community. The board believed that one of the best possible uses of the reserve funds

was to financially support the members' desire to preserve the community's unique natural environment. A proposal to amend the community association's covenants to accomplish this goal was voted on by the members at its 2007 annual meeting. First, the covenants would redefine the permitted expenditures of the contribution to reserves fund. Second, one of the permitted expenditures would be donations to tax-exempt organizations whose purpose is the conservation of natural lands and habitat on Kiawah Island. The amendments passed with 85 percent voting in favor at a duly held meeting.

The association's land management staff used to blow, mow and go, operating by rote rather than considering what was best for the management of the association's most expensive asset, its land. Staff mowed large areas of unirrigated turf, which in summer became areas of bare soil eroded by wind. In 1998, the association replaced three windshields from members' cars that were hit when the mowers driving through these sand areas flung rocks. Things needed to change since the maintenance methods were not in harmony with the mission and vision of the association. It was apparent mowing was not a problem per se, but mowing bare sand was.

The board approved new Land and Lakes Management Departments Standard Operating Procedures in 2000, which established best practices for managing common properties, and established thresholds for wildness. For example, turf was allowed in specific instances but only where it could be irrigated. Trees and shrubs would be pruned, but only if they posed a danger to lines of sight for vehicular traffic. When pruned, trees and shrubs would retain their natural shapes – no hedges allowed. In addition, integrated pest management was used throughout for both land and lakes.

Regular water quality testing and data input helped build a profile for all lakes. Instances that were exceptions to that profile were treated. For example, the introduction of fish reduced levels of mono-filamentous algae and mosquito larvae.

In 2004, the board approved Landscape Management Guidelines for Association Members. This document had three guiding principles: that the aesthetic beauty of Kiawah Island was in its wildness and is to be protected; that landscape designs would sustain wildlife populations; and that all association members share in protecting Kiawah Island's habitat and environment. The guidelines followed requirements held by the existing architectural review board and the advice of the conservancy. The document also had several landscape objectives:

- The island's natural setting was a unique environment so plants introduced should be native species.
- Members should reduce or remove lawns in favor of areas of native vegetation and forest
- They should monitor irrigation systems to assure efficient use of water,
- Keep three-foot natural buffer zones at pond or lake edges.
- Allow woods to grow between your home and your neighbors.
- Introduce no plantings on the dunes or the marsh edges, since these had their own special plant ecosystems. Do not mow, prune or otherwise maintain there.

Reaching out for help and giving to the greater community, the association hosts graduate students from the local land grant university, who research the community's land and lakes. The local municipality hires a biologist to help track wildlife populations on island and the state monitors alligators. The community's resort operates an interpretive nature center, which hosts onsite tours for members and guests. To access nature areas, the association created 17 miles of leisure trails and three nature viewing towers. The National Oceanic and Atmospheric Administration regularly uses the island for

research. Children from local schools help with lake-edge erosion control and creation of oyster beds in the island's creeks. Such infusions of outside help and interest convinced members that the community is more than a grouping of homes and businesses. It is an area that fosters habitats for wildlife and flora.

Last year, the community sought and received a certificate of exceptional merit from the National Wildlife Federation, recognizing the establishment of a community wildlife habitat for the whole island. This certificate stated that the community had taken exceptional action in preserving, enhancing and restoring wildlife habitat and in communicating the importance of habitat stewardship to the public.

case study #4

Marlyn Condominium, Inc.

Size:	121 units
Age:	71 years; condo conversion, 25 years ago
Location:	Washington, D.C.
Board Size:	5 members
Contact:	Harry Richter, CMCA, General Manager
E-mail:	managemarlyn@aol.com

The Marlyn was built by well-known Washington real estate developer Gustave Ring in 1938. The building is named after his wife, Marion, and his daughter, Carlyn. The Art Deco design came from architect Francis L. Koenig, working as assistant to Harvey H. Warwick, Sr., the architect of record. At the time of its construction, The Marlyn enjoyed the distinction of being the country's first residential apartment building with central air conditioning.

Situated on a steeply sloped site on Cathedral Avenue between Idaho Avenue and 39th Street, the building is a six story u-shaped facility with an elevator located in the apex of each wing. One hundred and twenty units include studio, one- and two-bedroom accommodations. Amenities include a fitness center and sauna, entertainment facilities, separate entrances for residents and visitors, and indoor parking. The building was converted to a condominium in 1974.

Initial Conditions

Heating/cooling. By 2008, the original state-of-the-art air conditioning system had been replaced with contemporary central HVAC equipment utilizing the same distribution infrastructure. The original steam heat had been converted to a hybrid steam/hydronic system, with two steam boilers feeding into a heat exchanger that supplied hot water to convector units inside the apartments.

The two Superior steam boilers were manufactured in 1968 and are described as dry-back Marine boilers. The burners have been converted from oil to natural gas. The distribution system is called a "two pipe" system utilizing steam traps to separate the supply and return sides of the piping.

Ventilation. In 2007, ventilation ductwork on the roof was removed. This was an extensive system of ducts and exhaust fans that serviced kitchen areas in each tier.

Hot Water. Domestic hot water is provided during heating season by the steam boilers and off-season by gas fueled heaters.

Elevators. The elevators are original equipment, maintained by Otis Elevator, the manufacturer and original installation company. One machine has a DC motor rated at 40 amps, the other an AC motor rated at 40 amps.

Windows. In 2006, windows in residential units were replaced with thermal pane windows.

Lighting/interior. The building was designed without day lighting for the common area hallways, so lighting fixtures in these areas were on continuously. Floors one through five are each lit by 13 fluorescent fixtures, each with a single 22-watt bulb, with the ground floor using four of the same fixtures. The sixth floor has a dropped ceiling

to accommodate HVAC piping. It was lit by 16 fluorescent fixtures, each having two 39-watt bulbs, plus 14 spotlights, each rated at 50 watts.

A communal laundry center in the basement, open at all times, is lit by four fluorescent fixtures, each with two 40-watt bulbs. The room has a large window area covering approximately 30 percent of the exterior wall. There are 10 washers and 10 dryers, and an exhaust fan that can be manually operated.

Other continuously-lit areas included the basement hallway and the lobby. The lobby has windows and two glass-door entrances. The basement has one window and two service doors with windowpanes providing minimum lighting, and 13 compact fluorescent bulbs in single bulb fixtures.

There is an indoor parking garage, lit continuously with 54 fluorescent bulbs rated at 40 watts each. The garage has six glass block windows providing daylight over approximately 10 percent of the exterior walls.

Lighting/exterior. Exterior lighting consists of four high-intensity floodlights mounted at roof level, and approximately 20 spotlights providing area and landscaping lighting. The front entrance also uses designer canister fixtures with enclosed flood lights for landscape lighting.

Miscellaneous. Seven electric motors of various capacities operate intermittently on the HVAC, domestic water, and gas burner equipment. A refrigerated vending machine in the basement runs continuously. Two saunas use electric heating elements. One full size and two office size refrigerators are available in the party room and staff rooms.

Evaluation of Initial Conditions

Heating/cooling. During initial inspection and interviews with maintenance personnel, the boilers were reported to be functioning properly with no operational problems. The boilers were set to operate between two and five pounds of pressure; producing steam when the pressure drops to two psi and running until the five psi limit is reached.

The "MAIN" setting of five psi is the point at which the burner shuts down. When the pressure has dropped three psi—the "DIFFERENTIAL," the burner comes on again.

The pressure setting for a steam boiler is determined by the distance from the boiler to the furthest part of the building receiving heat. In a two-pipe system, such as this one, the design standard is two ounces of pressure for every 100 feet of pipe. The Marlyn was originally designed to use steam to heat convectors inside the apartments. Assuming the convector furthest from the boiler room is approximately 200 feet away with an equal distance for the return piping, eight ounces of steam pressure would have been needed to cover the 400 feet of piping. Even in its original design, five psi would have been excessive when only 0.5 psi was needed.

But when the original design was modified, the distance that needed to be covered by steam was drastically reduced to the length of the boiler room. Steam now travels from the boilers, across the room to the heat exchanger, where it transfers its heat to the water that is pumped out to the apartments.

Operating a boiler at higher than necessary pressure significantly increases fuel consumption without any corresponding benefit. Downstream of the heat exchanger on the steam piping return is a steam trap intended to prevent steam from entering the return line to the condensate tank. A bypass loop has been installed around the trap, controlled by a gate valve marked "Open winter condensate." The need for this bypass loop is unclear.

Energy efficiency. The process of greening a building must begin with the establishment of a performance baseline. The local utility company is a good place to start. To

create an electricity usage profile for The Marlyn, the association reviewed kilowatt hour use for the previous twelve months. The chart lists kilowatt hours per month.

The building has three electric meters servicing the common elements. The meter used to generate this graph was the main house meter. It is a Time Use Meter (TUM), which measures consumption during specific periods of the day.

Hours for on-peak usage are noon to 8 p.m., Monday through Friday. Hours for interim usage are 8 a.m. to noon, and 8 p.m. to midnight, Monday through Friday. Hours for off-peak usage are midnight to 8 a.m., Monday through Friday, and all day Saturday, Sunday and holidays.

Because off-peak usage includes all time periods on weekends and holidays, the association would expect off-peak use to be approximately one-third greater than on peak and interim use combined for the same month. Usage above that one-third figure can be attributed to activities exclusive to the midnight to 8 a.m. period. This time period is one of minimal building operations. Although the laundry center is open 24 hours, usage drops off significantly after 10 p.m. Likewise, elevator use after midnight is minimal. The extra nighttime consumption is due to exterior lighting. Once a performance baseline has been established, it can be used to measure improvements.

Additional Resources

Books available from CAI

Building Community: Proven Strategies for Turning Homeowners into Neighbors, Community Associations Press, 2005.

Greening Your Home: Sustainable Options for Every System in Your House, by Clayton Bennett, 2008.

Influencer: the Power to Change Anything, by Patterson, Grenny, Maxfield, McMillan & Switzler, 2008.

Web Resources

www.ase.org, Alliance to Save Energy, energy conservation

www.bikesatwork.com, alternative transportation

www.commuterolutions.com, alternative transportation

www.abanet.org/enviro/climatechallenge, American Bar Association, legal industry

www.aceee.org, American Council for an Energy Efficient Economy, environmental policy

www.greencars.org, American Council for an Energy Efficient Economy, transportation

www.caigreen.org, CAI's Community Green website

www.zipcar.com, car sharing

www.carsharing.net, carpooling

www.erideshare.com, carpooling

www.carpoolworld.com, carpooling

www.abacus-us.com, catalog mailing list

www.catalogchoice.com, catalog mailing list

www.realclimate.org, Climate Science from Climate Scientists

www.climateprogress.org, an insider's view of climate science, politics and solutions

www.noimpactman.typepad.com/blog/, Colin Beavan, irreverent blog

www.cnu.org, Congress for the New Urbanism, transportation/sustainability

www.optoutprescreen.com, credit card solicitation

www.treehugger.com, a Discovery Company

<http://blog.michellekaufmann.com/?p=1822>, *Embracing Thoughtful, Walkable Neighborhoods* (white paper)

www.dsireusa.org, energy tax credits

www.grist.org, environmental news and commentary

www.climateethics.org, ethical analysis of climate science and policy

www.ec.europa.eu/sustainable, European Union, sustainability

www.ec.europa.eu/environment, European Union, environment

www.fscus.org, Forest Stewardship Council, green building materials and paper products

www.gliving.tv, G Monkey, hip green living

www.fueleconomy.gov, improved gas mileage

www.nahb.org/news_details.aspx?sectionID=0&newsID=8533, green building standards

www.ecorazzi.com, green gossip

www.thegreenoffice.com, Green Offices (commercial site)

www.greenroofs.org, Green Roofs for Healthy Cities, building-new and existing

www.guardian.co.uk/environment/climatechange, *The Guardian*
www.plantnative.org, landscaping
www.nahbgreen.org, NAHB Green
www.greenlivingtips.com, Michael Bloch, Australian blog
www.nrdc.org/greenliving, National Resources Defense Council, green living
www.thegreenguide.com, National Geographic, multiple
www.switchboard.nrdc.org/, Natural Resources Defense Council
www.dotearth.blogs.nytimes.com/,
www.worldchanging.com, nonprofit organization of writers, designers and thinkers
www.mongabay.com, Rainforest Conservation
www.build.recycle.net, recycling
www.redo.org, recycling
www.earth911.org, recycling source
www.freecycle.org, reuse
www.habitat.org, reused building materials
www.greenlivingideas.com, Sean Daily, blog
www.swcs.org, Soil and Water Conservation Society
www.smartoffice.com, Sustainable Development International Corporation, green offices
www.eartheasy.com, sustainable products (commercial site)
www.carbonrally.com, Sustainability Challenge
www.ecogeek.org, techie blog
www.thisoldhouse.com/toh/green, This Old House, green retrofits
www.builderonline.com/table-of-contents/BUILDER/2008.aspx, Top 10 Green Products
www.greenguard.org, toxic emissions
www.ucsusa.org, Union of Concerned Scientists
www.nrel.gov, U.S. Department of Energy, renewable energy
www.energystar.gov, U.S. Department of Energy, energy
www.usgbc.org, United States Green Building Council (USGBC), new and existing buildings
www.epa.gov, U.S. Environmental Protection Agency, multiple
www.epa.gov/e-cycling, U.S. Environmental Protection Agency, electronics recycling
www.greenhomeguide.org, USGBC, green retrofits
www.regreenprogram.org, USGBC, residential improvements
www.epa.gov/greenvehicles, vehicles
www.greencars.org, vehicles
www.recycleamerica.com, Waste Management Recycle America, recycling source
www.awwa.org/waterwiser, water conservation
www.wendel.com, Wendel, Rosen, Black and Green, green law firm
www.wbdg.org, Whole Building Design Guide, green building

Other Best Practices Reports (available at www.cairf.org)

Community Harmony & Spirit

Community Security

Energy Efficiency

Financial Operations

Governance

Reserve Studies/Management

Strategic Planning

Transition

Reference Notes

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- 4 United Nations. 1987. "Report of the World Commission on Environment and Development," General Assembly Resolution 42/187, 11 December 1987.
- 5 California Polytechnic University, College of Environmental Design, John T Lyle Center for Regenerative Studies, Mission Statement, www.csupomona.edu/~crs/.
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About the Foundation for Community Association Research

The Foundation for Community Association Research is a national, nonprofit 501(c)(3) devoted to common interest community research, development, and scholarship. Incorporated in 1975, the Foundation is the only organization both recording the history of, and identifying trends in, residential community association living; supports and conducts research; and makes that information available to those involved in association governance and management.

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Community Associations Institute (CAI) is a national, nonprofit 501(c)(6) association created in 1973 to provide resources and education to America's 300,000 residential condominium, cooperative, and homeowner associations and related professionals and service providers. The Institute is dedicated to fostering vibrant, responsive, competent community associations that promote harmony, community, and responsible leadership.

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