SHADE

THE ROLE OF TREES IN OUR FUTURE

HOW TREES *Impact Energy*

SUSTAINABILITY *Leads the Way*

URBAN AND COMMUNITY FORESTRY

Creating Public/Private Partnerships

SHADE

THE ROLE OF TREES IN OUR FUTURE

IN FULL BLOOM

BUDS 'N' BRANCHES

Georgia Urban Forest Council (GUFC)

MISSION

To sustain Georgia's green legacy by helping communities grow healthy trees.

VISION

To be a broad-based leadership resource in promoting the importance of trees throughout Georgia by leveraging user-friendly technology, influencing the policy-making process and providing cutting-edge programming.

ACKNOWLEDGMENTS

US Forest Service
Georgia Forestry Commission
Georgia Urban Forest Council

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DISCLAIMER STATEMENT

Funds for this project were provided by the Urban & Community Forestry Financial Assistance Program administered by the Georgia Forestry Commission.

AROUND THE STATE

Restoration Project Preserves Stream

New bridge in Midway Park.

Watershed protection is one way Forsyth County protects its natural resources.

Last May, Forsyth County marked the completion of the county's first stream restoration project with a ribbon-cutting ceremony. Located inside Forsyth County's Midway Park, the project was designed to improve overall downstream watershed conditions and water quality, by stabilizing and restoring some 1,000 linear feet of degraded stream bank. A walking path now follows alongside the stream.

Fighting the Chinese Tallow Tree

Ann Fenstermacher (right) and fellow volunteer.

Skidaway Audubon is a non-profit organization devoted to environmental stewardship at The Landings, a residential community on Skidaway Island near Savannah. Recognizing the threat posed by the Chinese Tallow Tree, a Priority 1 invasive species, Skidaway Audubon endorsed the Chinese Tallow Tree Removal Project in 2007 and has since included in its mission the "education about and control of non-native invasive species." Supporting the efforts of volunteer work groups led by Ann Fenstermacher has resulted in a significant reduction in the Chinese Tallow Tree entrenchment — with more than 20,000 trees killed. Flyers and news articles have helped raise community awareness of the project.

Utility Promotes Arboriculture

Snapping Shoals EMC supports tree program.

When a utility company focuses on urban trees, the entire community benefits. Snapping Shoals EMC, located in Covington, is one such utility. Snapping Shoals markets best practices in utility arboriculture directly to its members through participation in the Tree Line USA program. Materials and programs encouraging proper tree care and planting practices are provided to its members. In addition, the utility promotes and participates in Arbor Day, Earth Day and other community events. They have also partnered with the Georgia Forestry Commission in three "Making the Shade Grant" projects, planting trees in elementary school playgrounds.

Support from the Top

Mayor Joiner (center) with JHTC members and other supporters.

Since its establishment in 2007, the Jefferson Heritage Tree Council (JHTC) has had an important person in its corner: Jefferson's Mayor Jim Joiner.

Under Joiner's guidance, JHTC was able to present many urban forestry programs before the Jefferson City Council for approval. Joiner was also instrumental in guiding the City Council to increase JHTC's budget over the past two years.

A significant move toward urban forestry protection came when JHTC revised the ordinances to better maintain Jefferson's tree canopy. Mayor Joiner presided over the City Council as it voted overwhelmingly to approve stronger tree protection laws.

Tree Planting Enhances Thoroughfare

Over 600 trees were recently planted along a two-mile stretch of McGinnis Ferry Road in south Forsyth County, underlining the importance of street tree plantings in our urban environment. The road passes through Technology Park, a master-planned, mixed-use 1,900-acre development that is home to corporations, retail businesses, restaurants, homes, churches and a hospital. Quality of life is an important value for the development.

The tree planting was part of an upgrade to the streetscape, following the widening of the thoroughfare, which carries thousands of cars per day. Both shade and evergreen trees were selected for the project.

Roswell Hosts Arbor Day Weekend

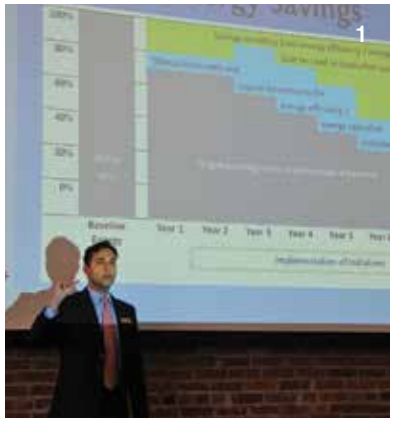
Rotary Club plants trees.

Trees Across Roswell, a unique initiative led by the Roswell Rotary Club, resulted in 2,500 trees being planted on Arbor Day 2012. The Rotary Club turned Arbor Day into "Arbor Day Weekend" with activities taking place on February 17, 18 and 19. The project increased the community's knowledge about the importance of trees and the benefits they provide by actively engaging Roswell residents and by creating a broad-base partnership of support with diverse organizations.

Over 150 people gathered at the Chattahoochee Nature Center (CNC) for a kick-off rally on February 17, with more than 450 individuals participating in the tree planting.

AT THE *Conference*

Attendees at the GUFC Conference and Awards Luncheon, held Oct. 24–25, enjoyed the ambience of LaGrange's historic Del'avant Center, originally home of the Kress and McLellan five-and-dime stores. This year's theme explored "Sustainability and the Role of Trees."



1. Shan Arora of Southface's Sustainable Communities Team; **2.** Checking in at the Conference; **3.** Dr. David Laband, chair, School of Economics, Georgia Institute of Technology; **4.** Conference attendees Beryl Budd, Georgia Forestry Commission (retired), and Nancy Howard, environmental technician, Fayette County Stormwater Management; **5.** City of Rome's Brian Roberts and Susan Thomas; **6.** Renee Hoge, Steve Dempsey and Kevin Nix of Forsyth County's Stormwater Division, Department of Engineering, and Nancy Lovingood, Manager of Development Services, are flanked by (left) GUFC President India Woodson and (right) Georgia Forestry Commission's Sustainable Community Forestry Program coordinator Gary White; **7.** India Woodson, City of LaGrange's Joey Nixon and Jay Bartlett, and Gary White; **8.** India Woodson, Arbor Equity, Inc.'s Dan Bauer and Tyler Baxter, and Gary White; **9.** India Woodson chats with Southface's Shan Arora;

10. India Woodson, City of Savannah's Gordon Denney and Bill Haws, and Gary White; **11.** Learning about AmericanGrove.org; **12.** Marcia Bansley, former Trees Atlanta executive director (retired), introduces Ed Macie, recipient of the Mary Helen Ray Legacy Award; **13.** India Woodson, Ed Macie, regional urban forester, USDA Forest Service, Southern Region; Marcia Bansley, and Gary White; **14.** Awards Luncheon master of ceremonies Eric King; **15.** Ed Macie, USDA Forest Service, Southern Region, presents GUFC Executive Director Mary Lynne Beckley with National Urban and Community Forestry Program Award of Appreciation; **16.** Conference attendees learn about the importance of sustainability.

GEORGIA FORESTRY COMMISSION

Wormsloe Plantation's live oak-canopied entrance is breathtaking.

Planning the Future for Georgia's Urban Forests

by Susan Granbery,
Urban & Community Forestry Coordinator,
Georgia Forestry Commission

How will Georgia's urban and community forests fare over the next five years? The Georgia Forestry Commission, in partnership with the Georgia Urban Forest Council, recently held strategic planning meetings that will impact that answer.

During the two-day session, held at Trees Atlanta headquarters in Atlanta, a group of about 20 professionals mapped a detailed plan around three national priorities: 1) conserve working forest landscape; 2) protect forests from harm; and 3) enhance public benefits from trees and forests, as well as other strategic state objectives from Georgia's Forest Action Plan.

The meeting began with an exercise that defined the **strengths, weaknesses, opportunities** and **threats (SWOT)** facing the community.

Some of the **strengths** noted were: strong statewide partnerships, accessible volunteer base, increases in technical training, information accessibility through new technology and an increased awareness of certified arborists.

Numerous **weaknesses** were found in categories such as internal organizational aspects, process, communication and education, resources, socioeconomic and political contexts and negative outcomes. Similar challenges across these categories included declining resources, ineffective communication, lack of focus and the pace of change. As a result, negative outcomes have led to a lack of community support, insufficient influence on government officials and deforestation in Georgia.

The group identified a number of **opportunities** to address key issues that improve the health of Georgia's urban and community forests. In the categories of resources, advocacy, coordination, demonstration projects, education, and media and social networking, many specific strategies were listed that could be used for enhanced advocacy and outreach.

Threats to the conservation and health of Georgia's urban community forests fell into five categories:

1. External resources (lack of program funding from various sources),
2. Natural resources and environment (invasive/pest threats, water restrictions, storms and natural disasters),
3. Social and cultural shifts (less time outdoors, lack of public motivation to rally around big ideas),
4. Organizational resources (loss of staff resources and institutional knowledge due to cutbacks and retirements),
5. Political climate related to environment (state divestment in environmental issues, slow economy).

The group's work culminated in **four major strategic goals,** along with corresponding objectives, indicators, activities, timelines and responsibilities:

✔ **Promote tree canopy and longevity at the landscape scale through the green infrastructure approach.** Some of the objectives and activities to accomplish this include: develop green infrastructure policies and design criteria for model urban forests by producing communication materials for a public campaign; strengthen capacity of local governments to increase canopy in critical areas by planting trees and providing technical assistance; and promote the use of pervious surfaces through training and promotional events.

✔ **Increase active participation of local communities to advocate for community forests through education**

PHOTOS: GEORGIA FORESTRY COMMISSION

and tree plantings. Some of the objectives and activities to reach this goal include: reach all urban legislators with the "state of the urban forest" report by designing targeted media strategy and participating in legislative events; expand the "Children's Forest Network;" and reach out to community gardens and urban farmer programs for co-advocacy opportunities.

✔ **Promote the development and enforcement of local tree ordinances.** Some of the objectives and activities to support this include: assist 25 local communities per year to develop effective tree ordinances that connect to land use planning and transportation by meeting with local tree boards, elected bodies and others for reviewing and updating tree ordinance guide books; increase by 25 percent the public's use of websites and databases that provide tree valuation and conservation information.

✔ **Promote sustainable community forestry by training professionals to implement Best Management Practices.** Some of the objectives and activities to accomplish this include: partner with other agencies for online training; develop Spanish BMP materials; and add one new partner group per year.

The strategic planning meetings were highly rated by participants, especially the SWOT analysis, group discussions and opportunities to network.

The Five-Year Plan for Georgia's Urban & Community Forest, 2013–2017 can be viewed at the Georgia Forestry Commission's website, GaTrees.org.

by Mark McClellan, Management Forester, Georgia Forestry Commission

Seminar Focuses on State Tree

"There's nothing quite as sexy as a live oak!" So stated Dr. Kim Coder of the University of Georgia's Forestry School as he opened a seminar on Georgia's state tree last May in Savannah. Coder, a leading expert on the species, shared his knowledge and insights at the meeting sponsored by the Georgia Urban Forest Council, Georgia Forestry Commission, Savannah Tree Foundation and TreesSC.

Arborists and a variety of tree professionals in attendance learned a great deal about the many varieties of *Quercus virginiana* during the two-day session, which included a tour of Savannah's notable live oaks.

Coder explained that the live oak is rooted in Southern history and has distinct growing zones and preferences. Its future will be impacted by management decisions that address growth patterns, pests and development. Coder shared a number of interesting statistics about the tree, which has become an ecological and cultural icon of the South, including the fact that it's difficult to determine a live oak's age because it produces "false rings." The tree's growth rate is rapid at first, but it slows with age, and as a rule, "They're younger than you think," Coder said.

Georgia, Alabama and Florida are at the center of live oak territory, and experts believe the majority of Georgia's large live oaks took root around 1745. The species' habitat is slowly moving north and inland, but the tree still hasn't been successfully grown at the state capitol in Atlanta.

Live oaks have trademark long, low and large branches that creep over time and help them weather the storms they often face in coastal areas. These trees grow to an average 55 feet tall, with a six-foot diameter and an average crown diameter of 100 feet. Spanish mosses and resurrection ferns thrive on live oaks.

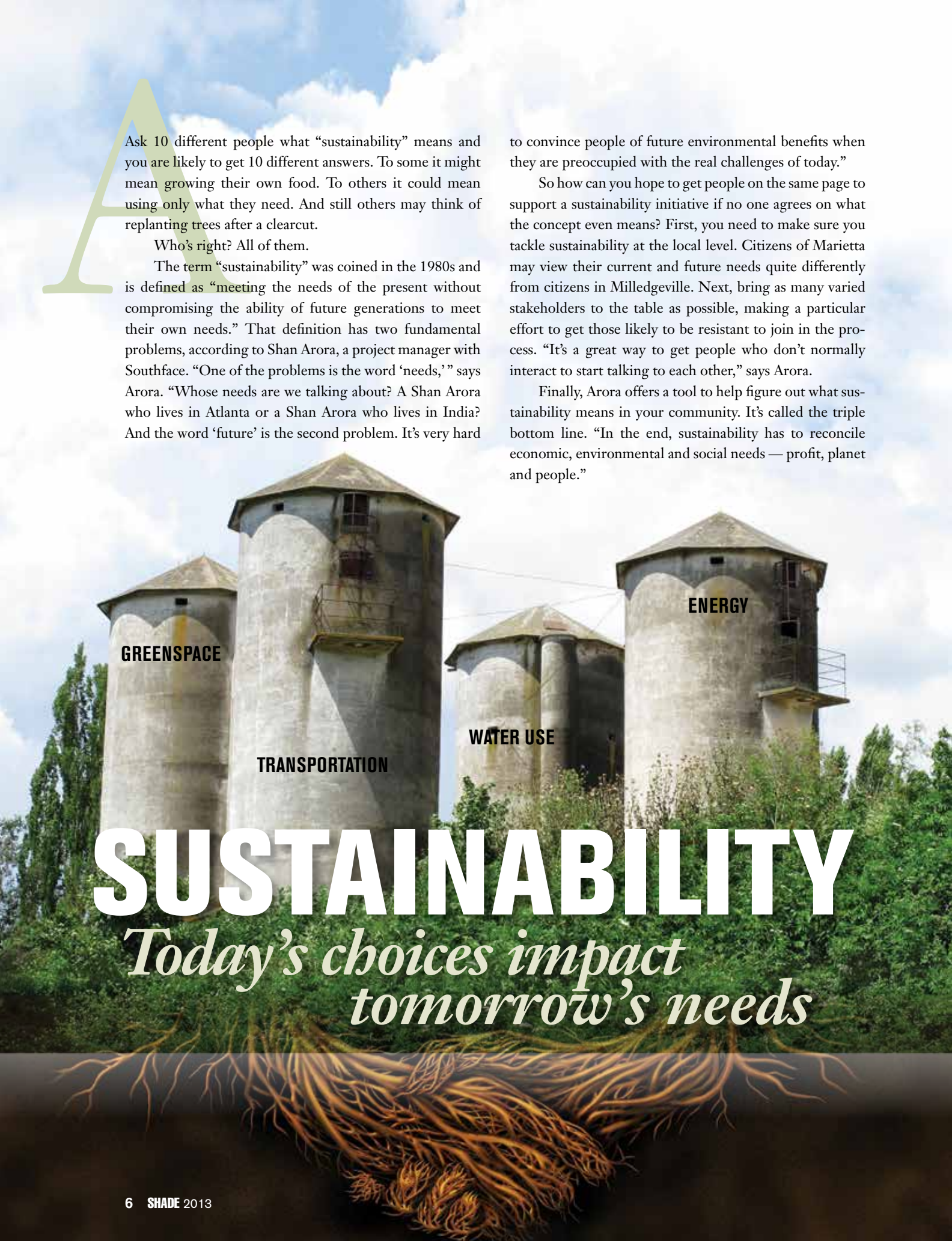
Encroachment from the crowns of competing trees and urbanization are the major concerns for the future of live oaks. If crown encroachment is over 35 percent, it can cause a downward spiral in the tree's health, and mitigation efforts such as crown thinning or removal of the encroaching species should be considered. Root systems should also be protected; paving over them can hasten the tree's demise.

Although live oaks are extremely hardy, exotic pests pose another threat. Though no known infestations have occurred in Georgia, the Georgia Forestry Commission is on the lookout for oak wilt and sudden oak death disease, and exotic oak borers, some of which have been positively identified in nearby states.

UGA's Dr. Kim Coder leads the Savannah conference about "everything live oak."

Dr. Coder expressed concern that arborists and other forestry professionals in Georgia are not contributing information to the registry that documents live oaks. He said he knows that many extraordinary specimens are growing in the state, but that records for Florida and Virginia, among others, surpass Georgia's. That, he believes, can impact our cultural heritage. To encourage the documentation and protection of the South's most notable live oaks, visit the online registry at www.louisianagardenclubs.org.

For an in-depth study of the live oak, read Dr. Coder's publication, http://www.gufc.org/wp-content/uploads/2012/03/Live-oak-pub-10-23.pdf



SUSTAINABILITY

Today's choices impact tomorrow's needs

Ask 10 different people what "sustainability" means and you are likely to get 10 different answers. To some it might mean growing their own food. To others it could mean using only what they need. And still others may think of replanting trees after a clearcut.

Who's right? All of them.

The term "sustainability" was coined in the 1980s and is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." That definition has two fundamental problems, according to Shan Arora, a project manager with Southface. "One of the problems is the word 'needs,'" says Arora. "Whose needs are we talking about? A Shan Arora who lives in Atlanta or a Shan Arora who lives in India? And the word 'future' is the second problem. It's very hard to convince people of future environmental benefits when they are preoccupied with the real challenges of today."

So how can you hope to get people on the same page to support a sustainability initiative if no one agrees on what the concept even means? First, you need to make sure you tackle sustainability at the local level. Citizens of Marietta may view their current and future needs quite differently from citizens in Milledgeville. Next, bring as many varied stakeholders to the table as possible, making a particular effort to get those likely to be resistant to join in the process. "It's a great way to get people who don't normally interact to start talking to each other," says Arora.

Finally, Arora offers a tool to help figure out what sustainability means in your community. It's called the triple bottom line. "In the end, sustainability has to reconcile economic, environmental and social needs — profit, planet and people."

"Get people thinking outside of their traditional silos."

Profit

Launching sustainability initiatives has a cost attached, no doubt about it. But properly applied, these initiatives can save companies and governments lots of money. Consider just a few examples:

- Cobb County installed LED lights in crosswalks and traffic signals. The savings — $270,000 a year.
- Interface, the LaGrange-based maker of modular carpet, enacted an aggressive waste elimination policy, which has saved the company some $500 million in avoided waste costs since 1995 (see sidebar, right).
- DeKalb County captures the off-gas from the Seminole Road Landfill and converts it into electricity. This project generates 3.2 megawatts of electricity an hour and has earned over $2 million in revenue for DeKalb County by selling it to Georgia Power.

You can certainly tie trees and urban forestry into the profit argument. Trees boost property values, generate jobs and attract workers. They lower expenses by acting as nature's public utility — cleaning the air, purifying the water, cooling the temperature and promoting public health.

"The city of Decatur, through using i-Tree, has quantified that every $1 spent on trees generates $3 in benefits, such as rising real estate values, energy savings, stormwater management and pollution control," says Arora. "These are preliminary numbers, but you shouldn't shy away from using the profit angle when you're talking about your urban forest."

Planet

As compelling as profits are, they can't tell the whole story. "Trees and the environment might be a hard sell if the only thing we are selling is profit," says Arora. "But their value is far beyond monetary."

Humans evolved in a natural setting, so our connection to nature and to the planet is hardwired into our DNA. People report feeling the most at peace, the most centered when they are in nature.

"I just bought a smart phone," says Arora. "It has five standard wallpapers, and every one is a nature scene. There are 35 ringtones that come standard on the phone, 33 of them have

A Corporate Tale: The "Monster" Goes Green

Ray Anderson was satisfied with Interface, the carpet tile company he founded in LaGrange in 1973 and had built into a thriving business, when he was asked in 1994 to address the sales force about the company's approach to the environment. Since he really didn't know much about the subject, he researched it. What he learned horrified him.

His company, and others like it, were environmental monsters. Carpet makers use lots of petroleum, both as a component of synthetic carpet and as an energy source to power production plants. Dyeing the carpet uses vast amounts of water and energy. And when people get tired of their old, worn carpet, it ends up in the landfill.

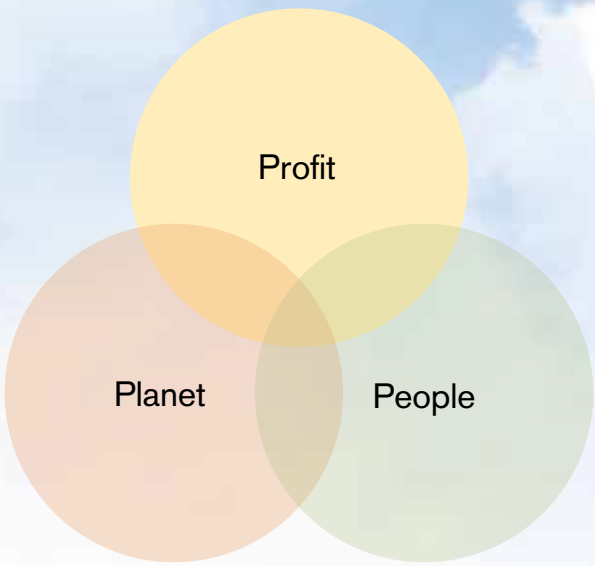
Anderson decided then and there to turn his monster into a paragon of sustainability, with the aim of being 100 percent green by 2020. The company has made great strides in three key areas: footprint reduction, product innovation and culture change.

■ **FOOTPRINT REDUCTION.** Interface has reduced its environmental footprint through improving energy efficiency, adopting renewable energy technologies, eliminating waste and reducing facility impact by making its physical locations LEED certified. For example, its aggressive waste elimination efforts have resulted in an 81 percent decrease in total waste to landfills from its carpet factories since 1995, and its cumulative savings from waste elimination activities have totaled more than $107 million.

■ **PRODUCT INNOVATION.** Interface has moved aggressively toward more sustainable products by using recycled and bio-based raw materials and developing ways to recycle its products. For example, it was the first carpet manufacturer to implement a process for the "clean separation" of carpet fiber from backing. The used carpet fiber is recycled into new carpet fiber, and the backing material is crumbled and transformed into new backing. Since 1994, Interface has diverted nearly 84 million pounds of carpet from landfills through recycling, repurposing and energy capture.

■ **CULTURE CHANGE.** The company's sustainability goals have inspired its employees to take the mission outside the company walls, improving communities and redefining how business should be done. Its sales team has founded or holds leadership positions in more than 30 local U.S. and Canadian Green Building Council chapters. Through its Environmental Education Grants program, Interface employees worldwide solicit and endorse grant applications for teachers to promote environmental awareness and responsibility.

Anderson passed away in 2011, but his legacy lives on.



Triple Bottom Line Provides Working Tool

To be most effective, sustainability has to reconcile a community's economic, environmental and social needs – profit, planet and people.

nature outdoorsy themes, such as 'seaside' and 'birdsong by the lake.' This is not by accident. As a species, we have a deep connection with nature, so don't shy away from using the planet in your sales pitch for your sustainability initiative."

Trees, of course, are closely tied with the environment. "The tie is so close that when people want to use a derogatory term for environmentalists, they call them 'tree huggers,'" says Arora. "We just intrinsically understand the central role that trees have in a balanced relationship between humans and the rest of creation."

People

In making the people connection, food is a great entry point, according to Arora. "Food is of immense concern right now," he says. "People are interested in eating locally grown food. Schools and universities in Georgia are doing fantastic things with sustainable food."

Emory University, for example, made a commitment to have 75 percent locally or sustainably grown food served in their cafeterias by 2015. "They began their initiative by hiring a farmer liaison, because farmers in north Georgia, western South Carolina, southern Tennessee and eastern Alabama just did not believe that Emory was really going to buy this much food this close to Atlanta," says Arora. "So the liaison went out and convinced the farmers that if they grow it, Emory would buy it. Now Emory is full steam ahead with this initiative."

A people angle can certainly be made with trees. Studies have shown hospital patients who can see trees and greenery from their windows recover more quickly than those who cannot. Children with ADD perform better after spending time among trees and nature. And some studies suggest trees help reduce crime by building a sense of community among neighbors.

Once you get everyone on board with the idea of pursuing sustainability, thanks to the triple bottom line, how do you actually plan and implement an initiative? As an illustration of how it can be done, Arora offers the work he did with DeKalb County to develop its County Long-Range Comprehensive Energy and Sustainability Plan. First he created a steering committee with representatives from the county, city, board of education, civic organizations and chamber of commerce as well as county commissioners and university sustainability officers. "With this cross-section of the community, we began a charrette-style conversation," says Arora. "A charrette is a collaborative workshop harnessing the talents of all interested parties to create and support a feasible plan that represents transformative change."

For one year, the steering committee discussed what sustainability meant to DeKalb County, focusing on 11 topic areas — energy efficiency, buildings, fleet management, land use, transportation, water use, trees and greenspace, solid waste management, procurement, local and sustainable food, education and outreach. Once the steering committee developed some suggestions for sustainable initiatives in these areas, they went out into the community to get feedback.

"We sat down with different people and asked, 'What are you currently doing?' 'What do you think the near-term, mid-term and long-term goals should be for your department?' and 'What are the challenges you are having?'" says Arora.

The latter question elicited some telling responses. For example, when Arora sat down with fleet managers, they explained that they manage the fleet but don't drive the cars — public safety and public works personnel do. So if the county set an efficiency mandate, the fleet managers didn't feel they had the control needed to meet it.

"That opened our eyes to the critical need for interdepartmental communication and cooperation," says Arora. "In other words, we had to get people out of their silos."

Toward that end, the steering committee took those 11 topics, plus an added one — implementation — and divvied them up into four sustainability areas: sustainability

planning (including plan implementation, education and outreach, green procurement); energy (energy efficiency, buildings, fleet management); complete communities (land use, transportation); and natural resources (water use, trees and greenspace, solid waste management, local and sustainable food).

"The idea was to get department heads thinking outside their traditional silos," says Arora. "We created templates that required each department to sit down and take a look at the list of goals we created and say, 'I might be the operator of a building, but what can I do to reduce the amount of garbage that is produced by the county?' or 'What can I do that might help move our local sustainable food goals further?'"

DeKalb was able to launch this initiative with the help of a $250,000 grant, but Arora argues urban forestry groups could apply some of the lessons learned, even in the absence of funding. "The real key to using the triple bottom line approach is to get people out of their silos," he says. "Some people you deal with might say, 'My job is dealing with stormwater runoff,' or 'My job is dealing with road hazards. Talking to you about the coordinated management of our city's trees is outside my job scope. Why should I care?'

"Your job," continues Arora, "is to convince them that coordination will make their job easier, save time and save money. A well-managed urban forest can reduce stormwater runoff, and proper tree maintenance and pruning can reduce road hazards in the form of downed trees and limbs. Get people out of their silos and show them how their urban forest can enhance profit, the planet and people."

LEE CATHEY MULTI-IMAGE STUDIO INC.

Public/Private Partnership *Scores High Marks*

Cities of all sizes could learn a lesson or two about sustainability from LaGrange, GA. The West Georgia town of 30,000 boasts several successful and innovative green initiatives. LaGrange Mayor Jeff Lukken runs down the list.

One man's waste is another man's energy; at least that's true in LaGrange, GA, says Lukken. Troup County established a public/private partnership with two companies, Interface and Milliken & Co. The result: Innovative landfill design and a biomass reactor capture methane gas put off by decomposing waste, which Interface and Milliken use to fuel their boilers.

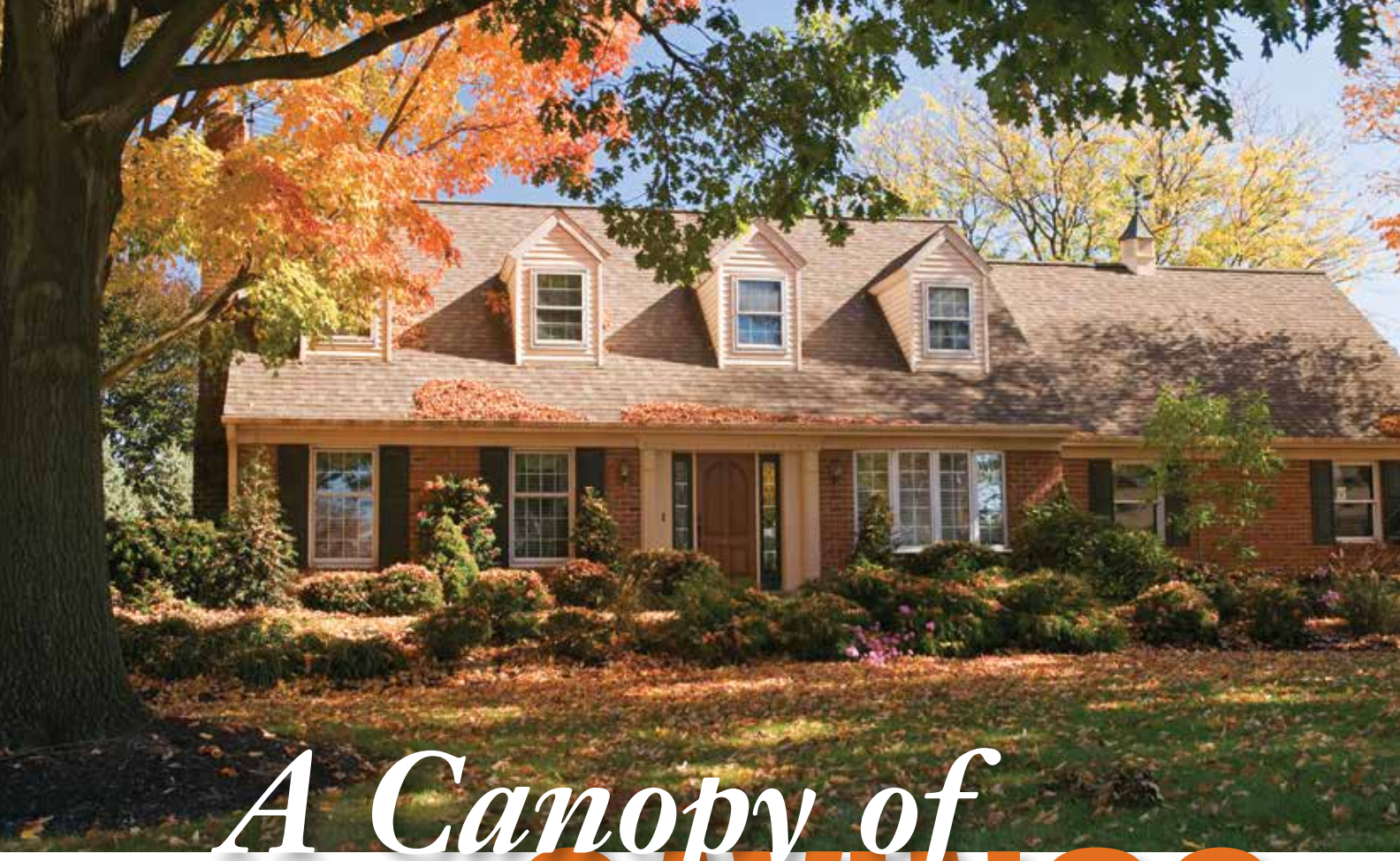
"The total cost of the landfill was about $4 million, and it will generate $28 million in total value to the city of LaGrange, including sales of methane gas," says Lukken. "Interface and Milliken get green energy and the good PR associated with it, as well as reduced fuel costs."

In addition, the innovative design accelerates waste decomposition, which extends the life of the landfill for up to eight years. "A new cell costs about $5 million, so getting eight additional years out of our existing one is a huge value to us," says Lukken.

LaGrange also tries to keep new landfill deposits to a minimum. "When customers bring us materials to be recycled, we give them 80 percent of the profit that we get from recycling it," says Lukken. "Last year we generated about $150,000 in net profits from recycled material, and 80 percent of that went back to the industries. That really encourages them not to put stuff in the landfill."

Through thoughtful zoning regulations, Troup County encourages development near its cities and towns and discourages sprawl. "If you develop within a mile of the city, you are allowed to have one residence per acre," says Lukken. "As you move farther away from the city, the requirement increases to one residence per three acres and then one residence per five acres. We are encouraging growth close to the city to take advantage of existing infrastructure, such as roads and schools, and to discourage sprawl. We are trying to protect the rural, forested personality of our county."

Within the next year, LaGrange plans to open a biomass fuel plant. The plant will use the woody debris left over from clearing roads and constructing buildings to generate electricity. "This debris is usually burned on the site, which generates air pollution," says Lukken. "We plan to use this debris to create another form of green energy."



A Canopy of SAVINGS

The concept seems self-evident — trees provide shade, shade lowers temperatures and lower temperatures translate into lower energy bills. That's fine in theory, but David Laband wanted to quantify those energy savings.

"I took my cue from memories of driving in the country as a child," says Laband, chair of the School of Economics at Georgia Institute of Technology. "I remember the houses were built in a very particular way — on a bit of a rise with windows at 90 degrees so they could catch cross-breezes no matter what direction they were coming from. And they had trees all around their houses.

"We lived our lives in ways that allowed us to capture the benefits of trees," Laband continues. "Then we got air conditioning. We started bulldozing all the trees to put in subdivisions and lost sight of some of those principles. I wanted to be able to attach a monetary value to no longer having those trees around our houses."

Laband originated a study, for which he sent letters to 2,000 homeowners in the Auburn, AL, area asking if they would share their monthly power bills and allow him monthly access to their property to measure shade conditions for one year. From that mailing, 160 agreed.

Laband then did a statistical estimation of the impact that different factors have on monthly electricity consumption, including: size of family, gender, age distribution, loads of laundry per week, square footage of home, age of home, exterior construction material, presence of a swimming pool, multiple freezers, usage of electricity versus natural gas to cook and to heat, thermostat settings in summer versus winter and the shade of trees.

For the next year, Laband collected energy bills for those 160 homes and recorded daily temperatures and humidity. Once a month he gathered shade information on each property. To do this, he visited the property in mid-morning, early afternoon and late afternoon, estimating what percentage of the property was shaded and categorizing the intensity of that shade — intense, moderate or light.

After taking these measurements for a year, Laband was able to attach a dollar value to many variables affecting energy consumption. For example, he found that the larger the family, the more energy they use. In particular, each additional family member adds 3.4 kilowatt hours per day, increasing the daily energy usage by 4 percent. But not all family members have equal impact. Children and women boost energy consumption the most. "Children tend to leave on the TV and all the lights," says Laband. "As for women, my wife explained that one to me. She said, 'We have hair.'"

The larger and/or older a house is, the greater the electricity consumption. A swimming pool turns out to be an incredible energy hog, increasing consumption about 221 kilowatt hours per day, or increasing daily usage by almost a third.

Laband was also able to assign values to shade. He found that every additional percentage of shade reduced kilowatt usage per hour by 1.6, so if you had 10 percent shade, you would save about 1.6 kilowatt hours per day, a little over 2 percent.

Laband also found that not all shade is created equal. The average house in his study had 17.5 percent shade, which lowered the energy bill by almost $10 a month in the summer months, at the Alabama Power Company rate at the time of this study. Having more dense shade (an average during the day of 19.3 percent of the house) would save more than $21 a month in electricity costs. And a home with 50 percent shade would save more than $32 per month.

"Placing a value on ecosystem services is a hot topic in sustainability circles right now," says Laband. "Now we can place a value on the energy savings trees offer by shading our properties."

How Shade Impacts a House's Electricity Costs

Time of Day in Shade	% of Dwelling in Shade	Density of Shade	Monthly Kwh Hours Used	Electricity Cost per Month
All day	0	N/A	2,294	$275
All day	17	Moderate	2,211	$265
All day	17	Dense	2,132	$256
All day	35	Dense	1,989	$237
All day	50	Dense	1,953	$234
All day	75	Dense	1,893	$227
Late afternoon	25	Dense	2,190	$263
Late afternoon	50	Dense	2,087	$250
Late afternoon	75	Dense	1,983	$238

Compiled by David Laband

Solar panels and trees live side-by-side at the Northview Orthopedic Associates office building in Dahlonega, GA.

Solar Power and Trees *Create a Win-Win Team*

Our country is in the midst of another gold rush, but this one has nothing to do with an underground mineral. The gold we are currently embracing comes from that big orb in the sky. With technological advances, plummeting prices and an aging electrical grid, solar power use is increasing exponentially these days. In fact, in 2010 — in the middle of a recession — U.S. solar installations grew by 37 percent.

What does this rush toward solar mean for urban forests? After all, shade trees and solar panels aren't exactly what you'd think of as cozy bedfellows. In fact, they are often on opposite sides of a legal battle. A few high-profile legal cases have pitted a tree-hugging neighbor against a sun-worshiper next door and vice versa.

It doesn't have to be that way, says Dan Staley, an urban planner specializing in green infrastructure and owner of DCS Consulting Services in Aurora, CO. After all, urban foresters and solar panel advocates are on the same side. "The major reason people go into the solar industry is because they want to help preserve the environment," says Staley. "They are generally very cognizant of the many benefits trees offer, and in general they would be more than willing to work with homeowners and businesses to preserve trees. The issue is to get arborists and solar installers working together so we can all enjoy the benefits of both trees and solar panels."

In fact, the rise of solar power provides a real opportunity for arborists and other tree professionals. Marketing services such as "solar access pruning" or "solar-safe pruning" offers a potentially lucrative and renewable business, particularly in the residential market. "The greatest opportunity for arborists to make a difference is the residential market, no doubt," says Staley. "The commercial market is much easier, since the roofs are so much larger. You have so much space that you can just move the solar panels to a spot that is not shaded. But the residential market requires some solar expertise to make it work well."

Expertise comes in the form of applying a basic equation. The sun's path is fixed. You can make a solar path diagram anywhere in the world and figure out how much power you want to collect. In North America, for example, you collect almost 100 percent of the power between 10 a.m. and 2 p.m. The variable is the site — each one is different. That means you need to do a solar analysis on each site to measure how the sun's rays hit the structure and the effect of shade from trees.

Once you understand the specifics of the site, you can develop a solar access zone, which would limit the height of plant material to 15 feet in certain defined areas. Staley and his wife are actually working on an app with which an arborist could define a solar access zone with their iPhone

or Android. "Something like that is on the near horizon," he says.

Staley divides the residential market into single lots — both new and retrofit — and neighborhood scale — again, both new and retrofit. Here's a look at how trees and solar panels can coexist in these different scenarios.

New construction offers a great opportunity for solar-sensitive arborists, but you might have to be a bit aggressive. "As an arborist, you should take the initiative and contact the developer of a new home," says Staley. "You might say, 'I see you are marketing your properties as green, well, let me help you with your tree selection and placement.'"

The key is to arrange the plants to maximize the benefits. "In Georgia and most warm Southern states, you have a happy coincidence," says Staley. "The most efficient tree placement for energy savings is straight west of the house or structure. Fortunately, where we want solar access — facing south — is the same place where we get very few benefits from the tree. So we can have tall trees straight west of the structure and have shorter trees south of the structure."

A residential retrofit is more challenging since you're not starting with a blank slate, but it also offers greater potential opportunity. With a retrofit, the arborist likely will face one of two situations. First, a homeowner may want to cut down the tree or trees to clear space for a solar panel. "I wouldn't recommend this — it results in a net energy loss because the elimination of shade heats the home so much, it generally outweighs the gain from solar panels," says Staley. "But if the homeowner insists, you can assist in the selection and placement of new trees to replace the ones cut down."

The second scenario would involve a homeowner who wants to keep his trees but also wants solar panels. "The arborist has many services to offer in this case," says Staley. "You have the one-time business of establishing the solar access zone and then repeat business from clearance pruning, which would be a combination of limb removal and thinning."

On a neighborhood scale, the concepts are basically the same. With new construction, you have the advantage of starting with a blank slate. You can alter the house setbacks, parcel sizes, roof angles and tree placement to maximize the benefits of both trees and solar panels. So on an east-west running street, for example, the homes on the north side of the street might be designed to collect solar power on the side facing the street. The homes on the south side would have their panels facing their backyards. That means the north-side homes might have longer setbacks and smaller front yard trees. Homes on the south side would have tall trees near the street to shade the asphalt and reduce the heat island effect.

"Here comes the sun,
Here comes the sun, and I say
It's all right."
–The Beatles

That's all well and good for new construction, but surely you can't retrofit an entire existing neighborhood that way, can you? "We have just that opportunity in New York and New Jersey right now in the wake of Sandy," says Staley.

"The message I want to get out is this," he continues. "Trees and solar panels can happily coexist — with some thought and planning."

Solar House IN THE WOODS

Renee Warrick has gotten Dan Staley's message loud and clear. The managing partner of Present Energi LLC has a goal of bringing solar energy technology to west Georgia, and she started with her own home.

Warrick and her husband bought three heavily wooded acres on which to build their dream home. "We picked the lot because of all the beautiful hardwoods, and we knew we wanted to keep as many as possible," she says. "But we also knew we wanted to put in solar panels."

Warrick has been able to have her cake and eat it too, to some degree. She lost some trees necessary for construction and establishing a septic system, but her lot is still heavily wooded. She has solar panels mounted on the south-facing roof and more on a pole in the ground that are able to be tilted to catch the sun's rays.

A relatively new technology helped Warrick quite a bit. Her solar panels use microinverters rather than the traditional single inverter. Solar panels capture DC (direct current) energy that has to be converted into AC (alternating current) to be used in our homes. Traditional solar panels are all wired together like Christmas tree lights into one inverter, so if one panel is shaded (think one Christmas tree light goes out), the whole system is less efficient. With microinverters, each panel has its own inverter, so one could be partially shaded but the others are working at maximum efficiency.

"A microinverter system works really well when you have trees," says Warrick. "Plus, it's modular, so you can add on more panels later. I know we don't have the most efficient solar system because of our trees, but we are still able to generate anywhere from 30 percent to 60 percent of our electricity needs, depending on the time of year."

GREEN *Goes Skyward*

Look up, and you might see green on a maze of roofs. More and more, when buildings are touted as "going green," it is meant in the most literal sense.

Though still lagging behind Europe, where green roofs have been accepted for decades, North America is starting to catch on to the green roof craze. In 2011, the industry grew by 115 percent over the previous year — the largest growth rate yet recorded here.

"Green roofs are one of the fastest-growing segments in the roofing industry," says Trey Whitley, southeast district sales manager for American Hydrotech, a waterproofing and roofing company.

Green roofs can be divided into two categories: extensive and intensive.

An extensive green roof is built primarily for its environmental benefits and less as a human habitat. It requires two to five inches of soil and is more suitable for retrofitting onto existing roofs, according to Whitley. Extensive roofs tend to require very little maintenance.

Intensive roofs are widely used on commercial buildings and are suitable for human habitat. They require a soil depth of at least six to 12 inches and can incorporate all types of plants, from ground covers to small trees. These types of roofs, particularly in the Southeast, require a good bit of maintenance, especially up front.

"In the Southeast, if you get behind in getting these roofs established, you'll always be chasing them," says Whitley. "For that reason, we require a water source, irrigation and a maintenance plan before we'll install a green roof. Once they get established, they'll do great, but it can take a lot of irrigation and maintenance to get them established."

Both types of green roofs offer many benefits to building owners and to the public.

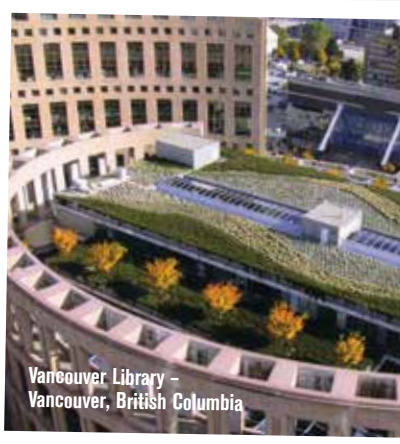
A MYRIAD OF OWNER BENEFITS

✔ ***Increased life expectancy.*** Although green roofs cost more to install than their traditional counterparts, they are made to last. "If you look at the life cycle cost analysis,

Green roofs thrive all across North America.


Mashantucket Pequot Museum – Mashantucket, CT


Providence Everett Medical Center – Everett, WA


Vancouver Library – Vancouver, British Columbia

you'd have to replace your original roof every 15 years or so," says Whitley. "But there are some green roofs that have been out there for 30 and 40 years. It's a permanent roof, and the design intent is to last the life of the structure."

✔ ***Energy efficiency.*** Green roofs are terrific insulators. They can help keep the building cooler in the summer and warmer in the winter. Their insulation prowess also helps to filter out noise, which is particularly valuable in buildings near airports, factories or busy freeways.

✔ ***Additional usable space.*** Intensive green roofs allow owners to use otherwise unusable space. They can serve many purposes, from gardening to restaurant terraces and from playgrounds to walking paths. "I've seen all kinds of unique uses," says Whitley. "Some schools have put vegetable gardens on their roofs and used them to teach students about gardening."

✔ ***Tenant benefits.*** Research has shown that workers who look out onto green settings enjoy a boost in productivity, and patients who can see green from their hospital window recover more quickly.

✔ ***Increased marketability.*** Going green is a great sales tool, and a green roof is a very visible statement of your green intentions. Green roofs have been shown to facilitate sales, lease-outs and employee recruitment.

✔ ***Building incentives.*** More and more municipalities and other government agencies are providing incentives that can help offset the cost of a green roof. Although no such incentives exist in Georgia at this time, Whitley says they may appear in the future, especially if they are linked to reducing storm water management.

HIGH MARKS FOR PUBLIC BENEFITS

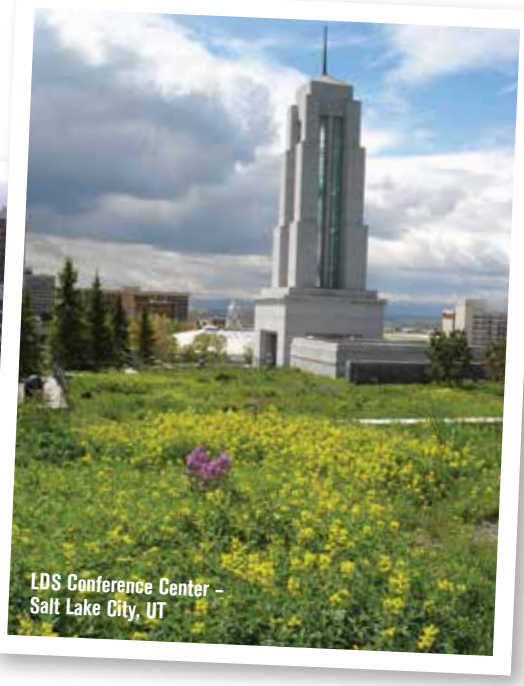
✔ ***Mitigates urban heat island.*** Plants on a green roof absorb light that would otherwise be converted into heat energy. They also cover some of the hottest surfaces in the urban environment — black rooftops.

✔ ***Reduces dust and smog levels.*** Green roof vegetation helps to filter out dust and smog particles. Nitrates and other aerosol contaminants are absorbed out of the air in rainfall and bound within the soil.

✔ ***Encourages storm water retention.*** Depending on the design, a green roof can typically reduce storm water run-off by 50 to 90 percent. Additionally, the peak flow volume is greatly reduced, and the peak flow period is delayed by as much as 4 hours, minimizing the impact on existing sewer systems.

"Georgia Tech is a great example of this," says Whitley. "There is no room to build at Tech, so if they put up a new building, they have to be able to capture the storm water. In one recent project, they installed a buried cistern that captures 100 percent of the water for the entire site and reuses the gray water in the building."

Given the many benefits green roofs offer, Whitley expects to see their continued growth. "Green roofs are already a mainstay in commercial roofing, and we are only going to see the numbers grow," he says. "The issue at hand is maintenance after the installation and long term. When that has been addressed, we have seen great success!"



LDS Conference Center – Salt Lake City, UT

Millennium Park – Chicago, IL

PHOTOS COURTESY OF AMERICAN HYDROTECH, INC.

The People Factor

From left to right: Gene and Carole Brogdon and Chris and Ted Flake.

Protecting Richmond Hill's tree canopy is a family affair for these members of the CBTF.

Planting and preserving trees is a family affair for **TED and CHRIS FLAKE.** Both have been members of the Coastal Bryan Tree Foundation since its inception in 2001, when Rena Patten gathered a group of like-minded friends to preserve the canopy in their rapidly developing community of Richmond Hill, just outside of Savannah.

"I'm a builder, and Gene (Brogdon, see below) is a developer," says Ted. "We both saw the need to plant and protect trees."

Today Ted serves as the foundation's president – its third since it was founded. During his 12 years with the foundation, he has seen the planting of some 566 trees. "Seeing those first trees we planted and how large they are now – it really gives you a sense of accomplishment," says Ted.

Ted, Gene and others worked closely with the county and the city to develop a tree ordinance. "We wanted to put guidelines in place to preserve our canopy, but we needed something that would work for builders and developers," says Ted. "I think we achieved that."

While Chris has never held an office, she has served the foundation diligently. A fourth and fifth-grade math teacher, Chris brings trees to the students and students to the trees. She brought Project Learning Tree (PLT) to her school system. A program of the American Forest Foundation, PLT provides instructions for teachers on integrating environmental education into the classroom. Chris works with area principals to come up with site plans for tree plantings on school property. She also coordinates with high school teachers to find student volunteers for tree plantings.

"I was telling my daughter recently, no matter how many times you see certain things, you are always in awe of them. Trees are one of those things," says Chris.

Like Ted and Chris, **GENE and CAROLE BROGDON** have been with the Coastal Bryan Tree Foundation since Day One. Gene just stepped down after serving for 10 years as the foundation's treasurer, and Carole remains active in fundraising efforts.

"I've been a developer most of my life, and we were in a fairly rapidly growing area," says Gene. "Although I tried to save a lot of trees when I developed, I saw a need for a coordinated effort to preserve and replant trees."

"And I've just always been a tree person," says Carole. "I've always been interested in the environment and how we can take care of it."

Gene lent his talents to drafting the tree ordinance and managing the foundation's budget. He also takes a lead role in organizing the tree plantings and even brings his backhoe to help out. However, for the last two years the foundation has elected not to plant any new trees, instead focusing on watering and maintaining the trees it has already planted.

Carole, a CPA by trade, helped write the successful grant application that allowed them to incorporate as a 501(c)(3) organization. "I'm good with paperwork and details," says Carole. She also helped organize the first Root Ball fundraiser in 2005. The every-other-year event draws some 150 to 200 people for dinner, a silent auction and entertainment.

Today Carole and Gene are in business together, managing a commercial project that they own. They still find time to participate in the foundation, but with an eye to future leadership. "We think it's time for the younger generation to step up," says Gene. "But we'll always stay active in the foundation. It's a great feeling seeing the trees we've planted, how they've grown and knowing we've been a part of that."

OUR CHILDREN ARE OUR FUTURE

The Georgia Urban Forest Council's mission is to "sustain Georgia's green legacy by helping communities grow healthy trees." 2013 GUFC President Rob Ryan focuses on the need to incorporate "green" education into our children's school curriculum.

SHADE: What change is needed in our children's educational curriculum?

RYAN: We need to do more to weave environmental and ecological lessons into our children's educational curriculum – not just to focus on the feel-good, warm and fuzzy field trips and general walks in the woods, but to really tie it into their educational careers and upbringing. Yes, there are wonderful and very powerful initiatives through educationally grounded organizations like the Nature Conservancy, National Wildlife Federation, Sierra Club and the Forest Service, to name a few. Many of these groups offer programs that last a day, a weekend or a week.

If some of the tenets that these groups strongly believe in could be brought into our schools on a full-time basis, this would go a long way toward ensuring our future. Schools are constantly tweaking the way they teach math, science, history or even reading, often cross-pollinating lessons across all subjects throughout the yearly curriculum. This could and should be done with learning about green subjects as well. For that matter, schools are being designed and built using state-of-the-art green techniques, professing their stewardship and environmental themes. These schools present a perfect opportunity to incorporate lessons from the green building process into the curriculum, creating a hands-on laboratory to parallel the teaching lessons.

SHADE: Why is classroom education important?

RYAN: Let's face it: Most kids, while they learn many life lessons from their parents, don't really listen to those parents when it comes to the 3R's and other academic topics; they listen to and learn from their teachers at school.

My own experiences with my children has shown that they tolerate (and even enjoy) my passion for the outdoor world, the environment and things ecologically-based. Our family hikes, my identification of plant material, the majestic scenery we have enjoyed and my preaching about water conservation are perhaps fleetingly acknowledged. I hope that somewhere in their sponge-like minds, they will remember and learn from the experiences.

However, to truly learn about all things environmental, the lesson needs to be repetitive – a thread that weaves together all the tidbits of the natural world, such as the urban forest and how that small piece of the puzzle is actually large and incredibly important.

SHADE: How can future generations sustain our green legacy?

RYAN: Whether our children know it or not, the urban forest touches their lives every day. Reinforcing this in their schoolwork would be a home run. Over 80 percent of children in the United States reside in urban and suburban areas and attend schools in these areas. Their experiences with our natural systems are limited.

These landscapes need to be part of a visible teaching tool, providing knowledge to all children, with the hope that they will use that knowledge to sustain our green legacy, embrace it and protect it. Nature needs to matter to our children; it needs to become relevant, and it needs to be reintegrated into our children's life experiences.

Smart Forestry Links

Alliance for Community Trees
www.actrees.org

American Forests
www.americanforests.org

The American Grove
www.americangrove.org

Coastal Bryan Tree Foundation
www.coastalbryantreefoundation.org

Georgia Grove
www.americangrove.org/ga

Green Roofs for Healthy Cities
www.greenroofs.org

Southface
www.southface.org

Sustainable Urban Forests Coalition
www.urbanforestcoalition.com

US Forest Service
www.fs.fed.us

University of Georgia Warnell School of Forestry and Natural Resources
www.forestry.uga.edu

Urban Forest Strike Teams
www.ufst.org

www.urbanforestrysouth.org

GEORGIA FORESTRY COMMISSION
www.gatrees.org

www.gufc.org

GUFC
315 W. Ponce de Leon Avenue
Suite 554
Decatur, GA 30030
404-377-0404
www.gufc.org

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U.S. Postage
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Forester with a Paintbrush

At its annual conference, GUFC rewards individuals, organizations, businesses, municipalities and counties for outstanding work in protecting and enhancing our community forests. Each award winner receives a framed, limited-edition print of a painting of a Georgia tree or trees.

In selecting the tree (or trees) for the painting, GUFC seeks guidance from the community in which it will hold the annual conference. This past year, LaGrange's Sam Breyfogle nominated a group of historic trees — six post oaks and a shagbark hickory placed on the Troup Heritage tree register.

Once the trees are picked, a photograph is taken and sent to the artist who has been painting the GUFC award for over 20 years — Barry Nehr. "We chose Barry to be our artist because of his outstanding work with the U.S. Forest Service," says Sharon Dolliver, a founding member of the GUFC.

Nehr has a special connection with trees. He began drawing when he was five years old, but he always planned to be a forest ranger. After studying forestry, he worked for about seven years as a forester in the Allegheny National Forest. While in that post, Nehr designed and illustrated a couple of brochures. His talent caught the eye of officials in the U.S. Forest Service office in Atlanta, who eventually lured him south. Nehr joined the Atlanta team as assistant to the then-regional illustrator Harry Rossoll — the creator of Smokey the Bear. When Rossoll retired, Nehr took his post as regional illustrator, a spot he held until 1989, when he too retired.


Barry Nehr

Today Nehr spends his time painting murals for exhibit companies — and painting the annual GUFC award tree. "Our annual awards ceremony is extremely unique because we are able to give award recipients limited-edition, framed prints of these paintings," says Mary Lynne Beckley, executive director of the GUFC. "It's such a wonderful tradition for GUFC, and we are so honored to be able to work with Barry each year." To see Nehr's work, visit barrynehr.com.