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# FACILITIES

## manager

MAY/JUNE 2011

### SUSTAINING COMMUNITY COLLEGES

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Building a Business Case  
for Going Green

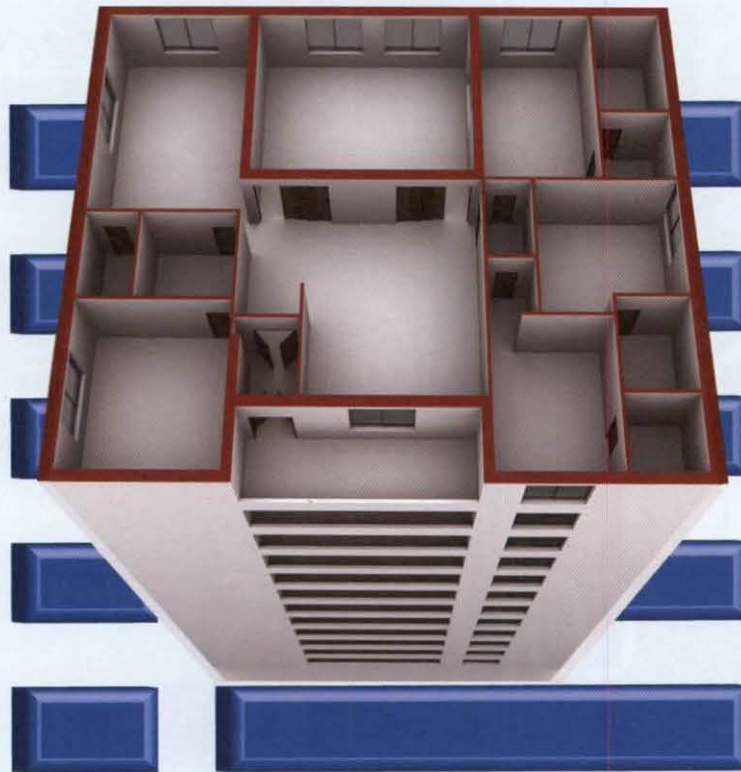
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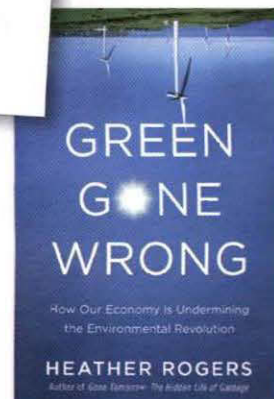
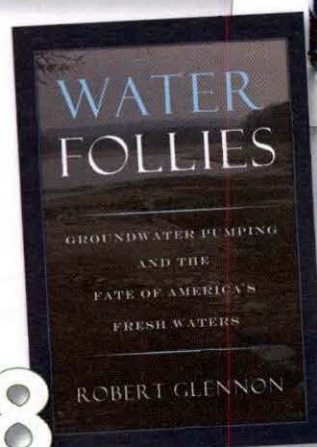
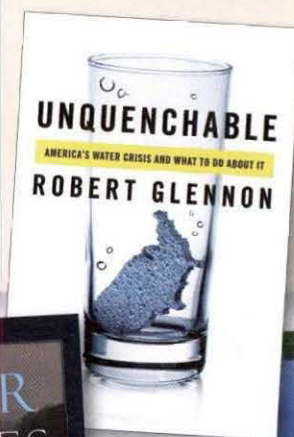
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## Community colleges in the

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The theme of Sustaining Community Colleges for this issue has several meanings. It relates to the support that is needed for community colleges to be successful, but it also refers to how community colleges are sustaining the communities in which they are located. And the focus of many of these articles on environmental sustainability is no accident; the more an institution plans for and invests in energy and environmental programs, the greater long-term benefit to the college.

The articles in this issue discuss actual concepts and processes that are being successfully applied to community college facilities, and which contribute to their viability and value. You will find several case studies discussing specific projects that are underway or have been completed. You'll learn about the Illinois Green Energy Network and how all 48 community colleges are working together to improve that state's energy effectiveness.


APPA President Darrel Meyer questions if we are engaging our community college members the best we can, and alternately, if they are utilizing APPA resources in the most effective manner. Other writers discuss the ways in which we can build a business case for sustainability projects, and provide guidance for streamlining your carbon emissions inventory. We also strongly urge you to use, and contribute to, the new SEED Center website ([www.theseedcenter.org](http://www.theseedcenter.org)),

developed by the American Association of Community Colleges, for sustainability education resources.

• • •

With this issue we introduce a new column on energy-related issues. Power Tools will be coordinated and sometimes written by long-time APPA business partner member Bill Johnson, vice president at the environmental and engineering firm Haley & Aldrich.

Our goal with this new column is, in Bill's words, "to bring you unique planning, design, and implementation solutions to energy-related issues" and to help educational institutions "get the best return on energy investment." We will present articles written by your fellow facility professionals, whose insight and expertise will provide solutions to the questions and concerns you deal with every day related to energy, utilities management, and environmental sustainability.

The new Power Tools column will appear three times per year (January/February, May/June, and September/October issues) and alternate with Matt Adams' Facility Asset Management column. If you have any particular topics or questions that you'd like covered in future columns, please let us know. 

## Coming in July/August 2011

- Special distribution at the APPA 2011 conference in Atlanta
- Operational Guidelines: Custodial, Grounds, Maintenance
- Excerpts from the forthcoming revised editions of APPA's staffing guidelines publications

# FACILITIES manager

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## About APPA

APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and elevate the value and recognition of facilities in education. APPA provides members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing. Formerly the Association of Physical Plant Administrators, APPA is the association of choice for 5,200 educational facilities professionals at more than 1,500 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at [www.appa.org](http://www.appa.org).



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# facilities digest

By Anita Dosik



# vote

## 2011-2012 OFFICERS

We are pleased to present the newly elected officers for APPA's 2011-12 administrative year:

### PRESIDENT-ELECT:

Mary Vosevich, University of New Mexico

### VP FOR PROFESSIONAL AFFAIRS:

David Cain, Coconino Community College

### SECRETARY-TREASURER:

Peter Strazdas, Western Michigan University

The successful candidates will take office at the APPA 2011 conference in Atlanta, Georgia, in July 2011.

Many thanks to the Tally Committee for counting and verifying the votes:

Al Stearns, chair  
Al Guggolz

## APPA U – THE NEXT GENERATION IN PROFESSIONAL DEVELOPMENT

Each January, April, and September, APPA has offered programming for facilities professionals seeking development and training in technical areas such as operations and maintenance, energy and utilities, general administration and planning, design, and construction. Additionally, participants gathered during these times of the year to learn better management skills and take the next steps to becoming the leader they can be. These premier professional development offerings are known as the Institute for Facilities Management and the Leadership Academy.

APPA realizes that the career path of facilities professionals is ever-changing, and therefore, APPA must keep up with these changes. To this end, APPA's Professional Development Vice President, Glenn Smith, is proud to announce the first offering of APPA U this September. The biannually offered event will bring together the Institute for Facilities Management and Leadership Academy in one location. The event will also offer programming based on regional need – such as the Supervisor's Toolkit or Drive-In Workshops – that cover hot topics in our field. APPA U will also provide a forum for the foundational credentialing programs—Educational Facilities Professional (EFP) and Certified Educational Facilities Professional (CEFP). The goal of APPA U is to expose facilities professionals to the vast offerings that can be found through APPA. Bringing together the Institute and the Academy in APPA U will provide a networking opportunity like no other.

What will remain the same? The outstanding programming and resources that our members have come to rely on and expect! And, of course, networking, which is a key benefit, and why APPA is the association of choice for educational facilities professionals.

Be ready ..... APPA U is coming in September .... And we want to see you there!

## APPA MEMBERSHIP RENEWAL NOTICES SENT – PAY BY MAIL OR ONLINE!

The 2010-2011 APPA membership year began April 1, 2011 and runs through March 31, 2012. Renewal notices and invoices have been mailed to all APPA international and regional members.

APPA now accepts dues payments by major credit card through the APPA website at [www.appa.org](http://www.appa.org) via myAPPA, your personalized APPA website account. Institutional, International, and Affiliate member organizations should also take note that their membership renewal invoices will identify the names of individuals authorized to vote in APPA's elections.





## APPA FACILITIES DRIVE-IN WORKSHOPS

APPA recently launched a new professional development service, the APPA Facilities Drive-in Workshop. APPA Drive-in Workshops are designed to support your staff education needs at a time when resources are difficult to come by for employee technical training. The four-hour programs allow local professionals to drive in mid-morning for several short sessions, advance their understanding of the latest facilities technologies and network with peers, and get back to their work and home quickly and conveniently with few, if any, travel costs.

The training is delivered by an APPA business partner that sponsors the workshop, while APPA member institutions serve as the host location and provide an adequate meeting space for up to 70 workshop attendees. Recent Drive-In workshops have been held at campuses in Kansas City, Seattle, San Antonio, Raleigh, North Carolina, Los Angeles, and elsewhere.

APPA staff members coordinate the marketing effort, reaching out to facilities professionals from both member and prospective member institutions within a two-hour driving distance of the workshop location. The workshop program is strictly an educational event with minimal vendor promotion or advertising. Topics are developed and speakers are identified in consultation with the host institution.

For more information on how your institution can host a Facilities Drive-In Workshop, please contact APPA Professional Development Manager Corey Newman at [corey@appa.org](mailto:corey@appa.org). Additional details are also available on the APPA website at <http://appa.org/Training/Driveinprogram.cfm>.

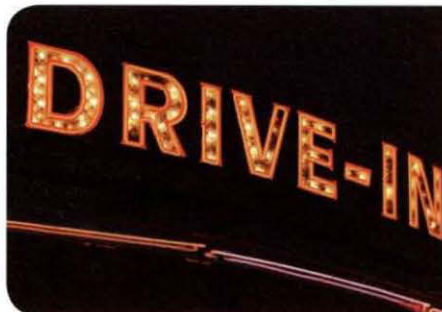
Registration and lunch for workshop attendees are complimentary, regardless of whether your institution or organization is an APPA member. We hope you will take advantage of this training opportunity.

### Thursday, May 26, 2011

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### Wednesday June 8, 2011

Johnson County Community College  
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NEW!

## APPA FACILITIES CAREER CENTER ON THE APPA WEBSITE

APPA has consolidated all of its career opportunities in one location on the APPA website. Here you will be able to post jobs, look for jobs, post and review resumes, and submit or review internship opportunities. The site is divided as follows:

### Job Express

Job Express is APPA's popular Web-based career development site for educational facilities professionals and their employers. Looking for a new employment opportunity? Scan Job Express for the latest job openings. Are you an employer seeking to post a position? Job Express is your best opportunity to reach qualified educational facilities professionals.

### Resume Bank

APPA's career center offers a resume bank for job seekers and employers. Job seekers can post and maintain their resumes with APPA online where they can be conveniently found by prospective employers. Access to the resume bank is free of charge for employers who post position openings through Job Express.

### Internship Listings

Students and individuals seeking hands-on experience in the field of educational facilities can visit APPA's Internship Listings to learn of available internship opportunities.

Visit the career center at  
<http://appa.org/careercenter.cfm>.

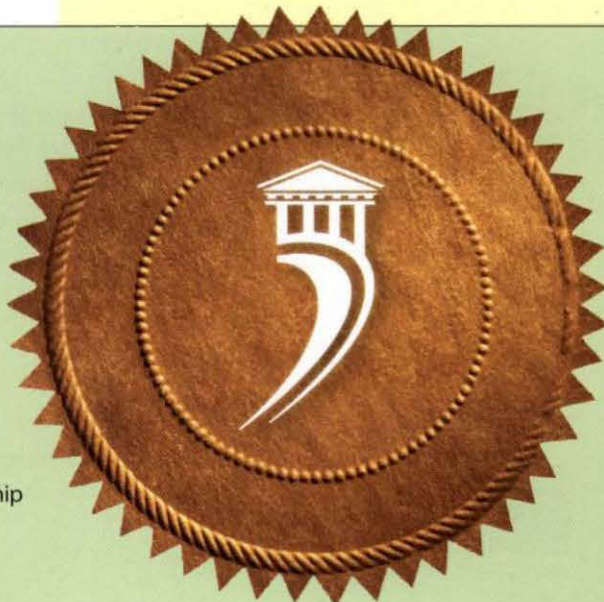
## REWARD YOUR STAFF – SUBMIT FOR A REGIONAL SCHOLARSHIP

When was the last time you were able to send a deserving member of your staff to an APPA event or regional event or even a chapter event? If you are still staring at this sentence – it has been too long!

APPA and our regional/chapter volunteer leadership understand that budgets continue to be an issue. Often times, staff development funding is the first to end up on the cutting room floor. But APPA's regions are here to support your desire to train your staff.

Each region of APPA has a scholarship program that allows you to fund partial tuition to a program; all of the tuition to a program; and in some cases, even travel/lodging. Take a few moments and visit the websites of ERAPPA, MAPPA, SRAPPA, RMA, CAPP, and PCAPP to see what opportunities are available. Keep in mind many times these scholarship funds go unused – so submit a scholarship for a member of your team today!

Visit [www.appa.org/training](http://www.appa.org/training) and click on "scholarships" for more information.





## APPA 2011: CUTTING EDGE AND INSIGHTFUL

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APPA 2011 is the premier event for educational facilities professionals...the ultimate networking and learning experience for facilities officers, directors, and management personnel at every level, and from around the world.

APPA 2011 will explore the latest trends, challenges, and solutions facing facilities organizations within colleges and universities; K-12 private academies and public school systems; libraries, museums, and other institutions of learning.

APPA 2011 offers over 40 conference sessions with diverse perspectives from today's leading facilities officers, campus administrators, college presidents, students, and education experts who are shaping and influencing the direction of education and the campus facilities environment.

For the latest on APPA 2011, visit us at [www.appa.org/training/APPA2011/index.cfm](http://www.appa.org/training/APPA2011/index.cfm).



## APPA BOOKSTORE

The APPA Bookstore: Your Portal for Facilities Management Insight

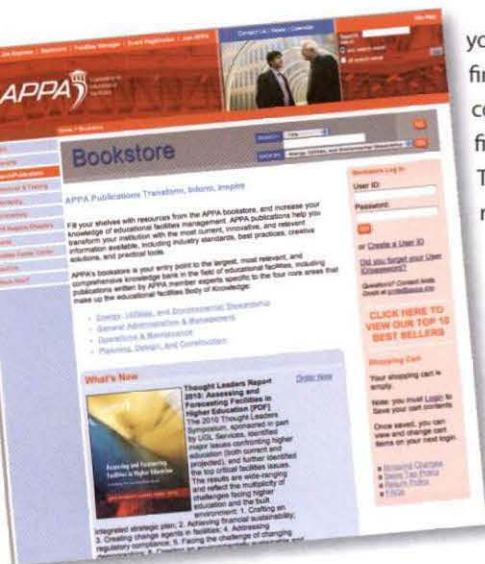
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Be sure to visit the APPA Bookstore at the APPA 2011 conference and at APPA U, where additional discounts will be available to those attending the events!

Get the resources you need to solve your facility's most pressing problems and to help you grow as a leader. Visit [www.appa.org/bookstore](http://www.appa.org/bookstore) today!



## EVENTS

**May 26 Drive-In Workshop**, University of Southern Maine, Portland, ME

**June 8 Drive-In Workshop**, Johnson County Community College, Overland Park, KS

**Sep 18-23 APPA U**, Ft. Lauderdale, FL

**Oct 3-7 ACUHO-I/APPA Housing Facilities Conference**, Orlando, FL

### REGION/CHAPTER EVENTS

**Jun 16-17 MD/DC APPA Conference**, Rocky Gap, MD

**Sep 12-14 RMA 2011 Regional Conference**, Regina, SK, Canada

**Sep 23-28 CAPP 2011 Regional Conference**, Springfield, MO

**Oct 2-5 ERAPPA 2011 Regional Conference**, Halifax, NS, Canada

**Oct 7-13 MAPPA 2011 Regional Conference**, Cincinnati, OH

**Oct 16-18 PCAPPA 2011 Regional Conference**, San Francisco, CA

**Oct 16-18 SRAPPA 2011 Regional Conference**, Jackson, MS

### OTHER EVENTS

**Jun 2-3 2011 National Electrical Code**, Richmond, VA

**Jun 18-21 CAUBO 2011 Conference**; Winds of Innovation, Calgary, AB, Canada

**Jun 23-24 2011 ACUPCC Climate Leadership Summit**, Washington, DC

**Sep 5-9 26th European Photovoltaic Solar Energy Conference and Exhibition (26th EU PVSEC)**, Hamburg, Germany

**Oct 9-12 2011 AASHE Conference & Expo**, Pittsburgh, PA

**Nov 3-4 Campus Heritage Symposium**, Washington, DC

For more information or to submit your organization's event, visit [www.appa.org/applications/calendar/events.cfm](http://www.appa.org/applications/calendar/events.cfm).



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# "Members Respond..."

By E. Lander Medlin

**T**his past fall 2010, APPA contracted with Stratton Research, a third-party publishing and marketing firm, to survey all members requesting feedback to assess and evaluate the value and appropriateness of services provided by International APPA, its regions, and state/local chapters. This survey was designed to help clarify services provided by International APPA as compared with regions and chapters to ensure that International APPA is providing members with a cohesive and integrated array of services while avoiding duplication and competition.

We achieved a 19 percent response rate calculated at the 95 percent confidence level with a margin error of +/- 3.31 percent. Demographic distributions by institutional Carnegie classification were consistent with current institutional memberships covering the four-year doctoral or masters degree granting institutions, research universities, liberal arts colleges, community colleges, and K-12/preparatory academies (in that order). The typical respondent was: Director/AVP (59%), Assistant/Associate Director/Manager (38%), and Supervisor (4%), with time in position at a median of 9 years, and a median age of 53 (typical mix).

## APPA'S EFFECTIVENESS

In terms of overall effectiveness against organizational goals, International APPA is considered "most effective" in transforming an individual facilities professional into higher performing managers and leaders boasting 84 percent, followed by elevating the recognition and value of

educational facilities and their direct impact on the recruitment and retention of students, faculty, and staff at 70 percent, and helping to transform member institutions into more inviting and supportive learning environments at 69 percent. APPA regions are considered "most effective" in helping directors and mid-level managers improve their technical and managerial skills at 67 percent. APPA chapters are considered "most effective" in helping supervisors and frontline employees improve their knowledge of facilities management and identify state/local issues at 51 percent. This assessment of effectiveness speaks volumes for the contribution these APPA organizations are making toward individual members' growth and development, networking needs, institutional value, and the profession's credibility and influence. This is further reinforced by why members join and what they expect from each entity.

Networking, education, and information rank high for all three entities. However, the difference in degree and focus for each entity provides greater clarity for differentiating roles and responsibilities.

**Members join International APPA** primarily to receive information to keep informed regarding the facilities profession and to gain information on the association's programming/services, *then* to attend professional development programming targeted at the senior level; networking follows. However, **members join the regions** primarily to network with peers, *then* to attend educational events that provide a regional focus at

a more affordable cost. **Members join chapters** to network with peers and gain training at affordable rates, yet the focus is more "hand-on" information for supervisors. With respect to members' *expectations* of services/benefits, verbatim comments targeted these areas:

- APPA International should provide professional development/senior-level programming, relevant/current resources, leadership, and insight on "big picture" issues and trends, benchmarking and best practices, website resources, networking on an international scale, and innovative operational solutions.
- Regions should provide networking and educational opportunities expressly focused on the regional aspects of issues, best practices, codes and standards, and information on what local groups/suppliers are doing with opportunities to share problems/solutions.
- Chapters should provide networking, training opportunities at affordable rates, more hands-on information applicable at the local level, and technical/supervisory training.

With stiff competition for membership in facilities organizations, members overwhelmingly said that APPA International and the regions are their first-choice organizations—good news given increasing institutional financial pressures.

## RECOMMENDATIONS

The following recommendations were made to aid in clarifying the distinct offerings and to further enhance member value:

- **Define the role and member offerings for each organization and develop a program to better communicate the brand.** APPA International is best suited for information/publications/research dissemination and education on strategic, senior-level programming, whereas regions and



chapters can provide strong education/training and extensive networking/idea sharing opportunities with a regional/local focus and angle. This will help solidify the "We are all APPA" brand, further capitalize on the strengths that each organization offers, and ultimately enhance member value.

- **Develop partnership arrangements with regions and chapters to deliver quality and relevant educational offerings developed by International APPA at the regional/chapter level.** Members are looking for more engagement, networking, and affordable educational offerings in their own backyard – a trend that will likely continue to grow with expanding financial pressures. International APPA should consider strategies to partner more with the regions and chapters in offering targeted education and training opportunities.
- **Explore an integrated, combined membership.** An overwhelming num-

ber of respondents are interested in the idea of a "single," integrated membership billing. This step could help strengthen the relationship amongst all three entities and lead to a more integrated approach to programming and offerings overall.

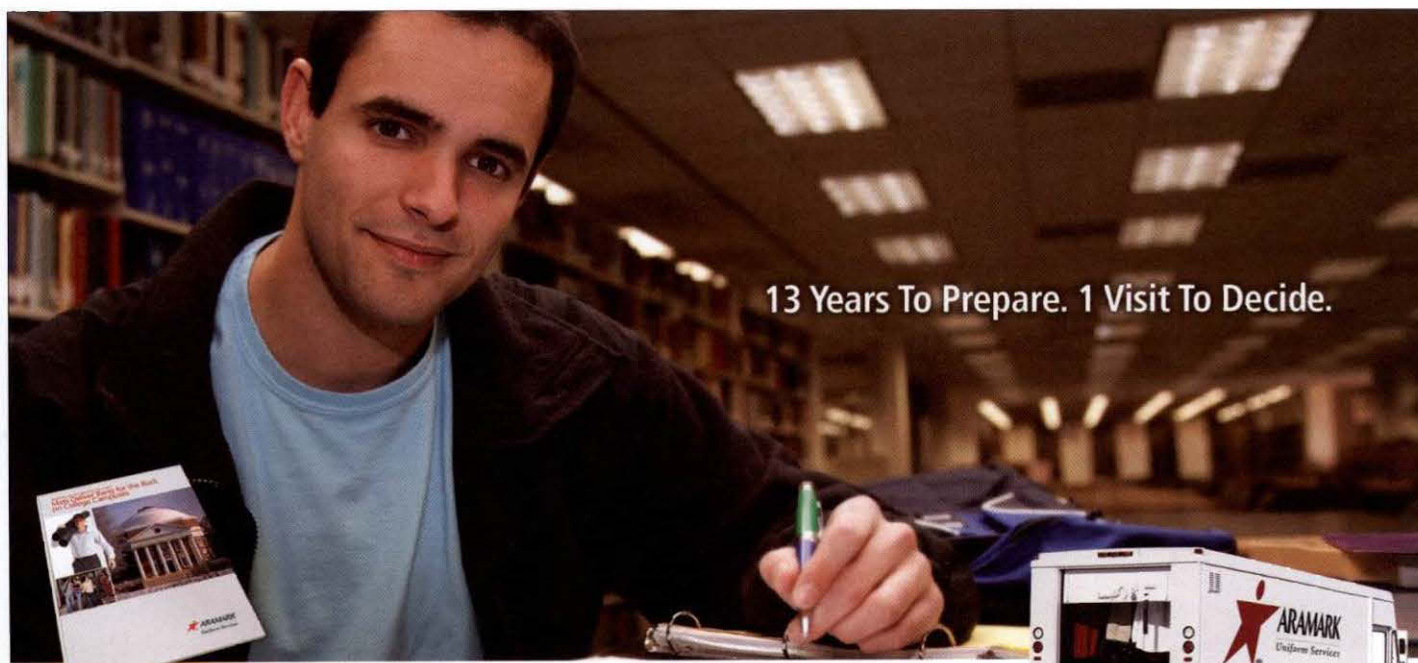
- **Consider refinements to International APPA and chapter educational offerings.** Explore ways to refine and further increase the value of some International APPA educational offerings that focus on, appeal to, and engage both ends of the spectrum – senior-level professionals *and* young facilities professionals. Regions should also assist chapters in providing more targeted, quality training programs. Consider holding targeted focus groups to further assess programming and identify ways to tailor content for broader delivery.

APPA International, the regions, and chapters will use this information to shape a more integrated array of member offerings, each suited to members' needs

at various levels and stages of professional growth and development. All of the data and extensive verbatim comments reflect the high value members place on their involvement in International APPA, its regions, and chapters. Furthermore, the survey responses are guiding APPA leaders as they plan for the future. International APPA's newly developed strategic plan has taken into account the responses to and recommendations from this member survey and an APPA/Regional Relationship Task Force by targeting 5 Leading Strategies which will be buttressed by 5 Foundational Elements. More details on the new strategic plan and its corresponding outcomes and objectives will be provided in future issues.

Thank you again for taking the time and effort to respond to our most recent call for member feedback. ☺

Lander Medlin is APPA's executive vice president; she can be reached at [lander@appa.org](mailto:lander@appa.org).



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# Expanding Community College Involvement In APPA

By William R. Ward II

**A**s a graduate of the APPA Institute for Facilities Management and the Leadership Academy, I have found the organization's training and educational programs to be of great benefit to me and my staff in our efforts to provide outstanding facilities for our students, staff, and the general public. I feel strongly that other institutions, especially my fellow community colleges, could also benefit greatly from membership in APPA.

APPA's mission statement, "To support educational excellence with quality leadership and professional management through education, research, and recognition" is definitely in line with the goals of any institution of higher learning. For APPA to provide support to community colleges achieve their goals, there needs to be greater engagement in the Association by non-participating schools.

## SPREADING THE NEWS ABOUT APPA

Pima Community College's Chancellor and Board of Governors have been very diligent in and supportive of our efforts to upgrade and modernize our facilities. In the winter of 2010, facilities staff completed a number of major accomplishments that have greatly enhanced the operations of our multi-campus district. These include the remodeling of our district-wide Student Services facilities and the replacement of the Desert Vista Campus central plant with a state-of-the-art modular unit. We also completed other equally significant projects such as a complete audit by an outside agency of all our facilities, and

**FOR APPA TO PROVIDE SUPPORT TO COMMUNITY COLLEGES ACHIEVE THEIR GOALS, THERE NEEDS TO BE GREATER ENGAGEMENT IN THE ASSOCIATION BY NON-PARTICIPATING SCHOOLS.**

an in-depth study of all college utilities and infrastructure.

During this same time period, we constantly heard bad news from the State of Arizona concerning the future of funding for higher education. With budgetary cuts looming on the horizon, we felt that it was important that we share the lessons we learned from these and other projects with our fellow community colleges, so that they can benefit from our experiences. We also wanted to hear about the accomplishments of our colleagues at other schools. Since there was no existing in-state facilities management group or organization to allow for this exchange of ideas and lessons learned, we took action to create a forum to accomplish this goal.

I thought it would be an excellent opportunity for all Arizona community college facilities management teams to meet and to address current facility issues facing all state community colleges. I talked with Polly Pinney, executive director, facilities management, at Arizona State University,

who was also the APPA President at the time. After discussions with her, we decided to bring one of our APPA business partners, GLHN Architects and Engineers, on board to provide assistance as event facilitators. Pinney offered to host this event at the Arizona State University in Tempe. We chose the title *Best Practices Symposium* to help generate interest from other schools that were invited to attend.

The drive-in symposium was an overwhelming success. We think of this as the first of many future events where we can periodically gather to discuss best practices, efficiencies, and lessons learned.

It also provided an opportunity to meet together to explore common issues and to arrive at solutions of these issues. Of great importance to the APPA organization, this event provided an excellent venue to share the benefits APPA has identified for community colleges and to encourage participation in the Association.

## EXPANDING INVOLVEMENT

Our symposium served as a model program for APPA to expand community college involvement in the organization. In the spring of 2010, APPA developed Strategic Objective #1 with the goal of increasing membership (particularly in underserved areas such as Community Colleges, K-12 schools, and Historically Black Colleges and Universities) and to arrest renewal losses stemming from the global economic crisis that has dramatically affected all




colleges and universities. Approximately 15 to 20 percent of APPA member institutions are community colleges, but they represent a small share of the institutions attending APPA educational programs. It should be noted that there are approximately 1,500 community colleges throughout the United States alone. Recognizing this disparity in participation, Darrel Meyer, APPA President and the director of facility services, at Metropolitan Community College, Kansas City, Missouri, has established a Community College Task Force to address improved engagement and recruitment of community colleges and other two-year institutions.

**APPROXIMATELY 15 TO 20 PERCENT OF APPA MEMBER INSTITUTIONS ARE COMMUNITY COLLEGES, BUT THEY REPRESENT A SMALL SHARE OF THE INSTITUTIONS ATTENDING APPA EDUCATIONAL PROGRAMS.**

This engagement group has community college "champions" from various institutions throughout the country as its members. These champions are facilities officers and directors from community colleges within APPA's existing membership. They are all participating in a grassroots effort designed to reach out and engage their local area colleges in APPA, to raise visibility of APPA, and to help show the value and benefits of APPA membership to prospective colleges. One of the ways they are doing this is to provide drive-in workshops for potential members to learn the benefits of APPA membership. Various community colleges have already sponsored these events, and the organization is beginning to reap the benefits.

In conclusion, APPA has been the recognized leader in the area of educa-

tional facilities management for many years, and continues to light the way for facilities management. However, like any organization or group, it must continue to expand its membership in order to develop the facilities leadership of the future. The message of the benefits and rewards of membership in the Association must be spread by other "champions"

within the organization who also desire to see APPA continue to expand and be inclusive of all the various size educational groups. 

Bill Ward is assistant vice chancellor, facilities, at Pima Community College in Tucson, AZ. He can be reached at [wward@pima.edu](mailto:wward@pima.edu). This is his first article for *Facilities Manager*.

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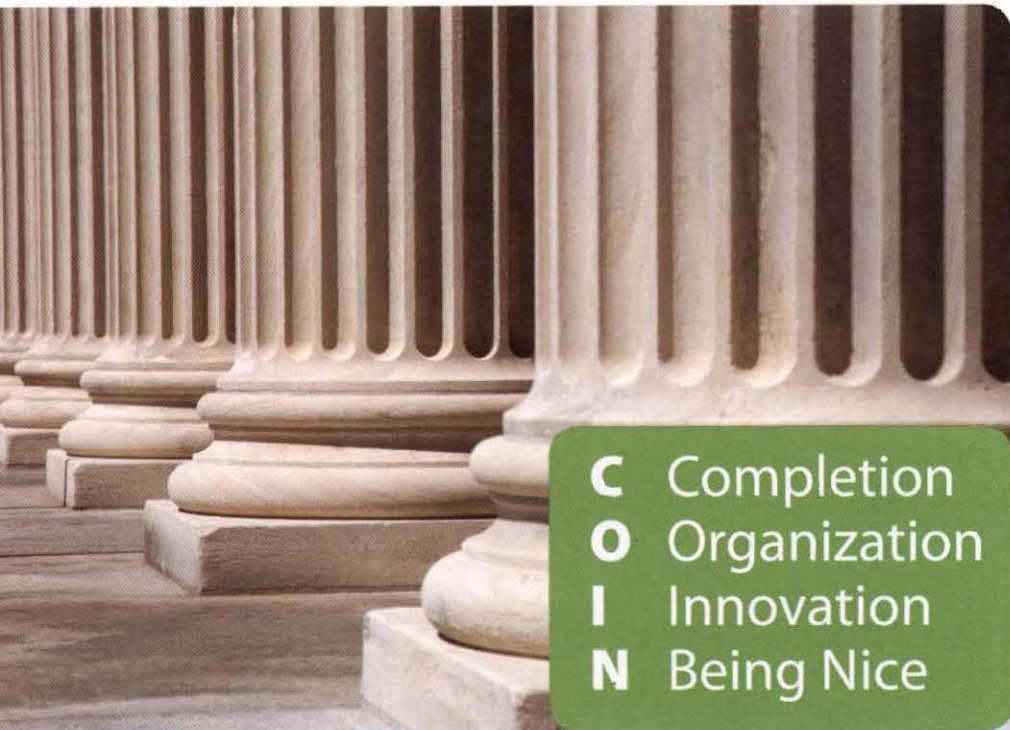
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# Consistent and Clutch ... by Design

By Joe Whitefield



I recently heard a coach say he prefers players who are more consistent to players who have more talent. What an interesting perspective. His follow-up comments addressed his ability to coach (manage) the game better when he knows what to expect from his players (good, bad, or marginal) and can depend on them meeting these expectations more often than not. In essence, consistency allows a good coach to execute a game plan that provides more situations that favor a team's strengths and fewer that expose a team's weaknesses.

This raised a question in my mind: How important is consistency in a facilities organization? Ideally, the business of the institution would happen on a schedule with predictable events nicely spread across the entire

calendar. Most facilities departments are proficient and can provide excellent services when there is adequate time and budget. Consistent demands met with consistent services; it is pretty straightforward. Just like the coach, we too can manage effectively when given the opportunity to deploy our strengths and cover our weaknesses strategically. Without a doubt, it is easier to manage when there is consistency in the demands for our services as well as the performance of our organizations.

The real problem occurs when the ideal conditions (adequate time and budget) are not present. The lack of time creates a condition of urgency. It is much more challenging to be effective when decisions must be made and plans executed quickly. Of course, inefficiency is costly financially as well -exacerbat-

ing the budget issues. One example of this is the often discussed preventative maintenance-vs-corrective maintenance management approach. The former has long-term cost benefits and fewer operational impacts, while the latter has long-term cost implications and operational impacts galore. And yet, time and budget issues continue to drive more and more institutions to the corrective maintenance side of the issue and the negative implications that follow. There is more urgency that increases the tension and leads to a reactive form of management that leaves everyone involved dissatisfied.

## CONSISTENTLY INCONSISTENT

If inconsistency is the only thing that seems to be consistent in your organization, here are a few thoughts.

First, develop a plan for the unplanned events that routinely spring up. This means reviewing the previous months and years of your operations and see where you were caught short in your preparation. Could you have anticipated better? Are there patterns to these events? Are the conditions that led up to the event any different today? How many of these events were a simply a result of poor communication on someone's part? Once you have identified potential causes develop a plan to help these events surface in a timely manner so they can be addressed appropriately. Possible responses include:

1. **Initiating** "horizon meetings" with customers to review the future and improve communications,
2. **Designating** a portion of the workforce to serve as a response team that works on pop up events as necessary, and



**3. Working** to develop a budget mechanism that can be more responsive to events – something similar to a renewal and replacement (R&R) type of account. A little work in this area can help an organization become more responsive and less reactive.


Second, get out in front of the events with clear communication that sets expectations. In the south, nothing disrupts campus operations like snow. While snow removal plans exist, they are not always well communicated. By posting the plan in advance, customers can see the roadways and priority sidewalks that are scheduled to be serviced – and, more importantly, the ones that are not. While this doesn't eliminate all of the calls and complaints once the snow starts falling, it usually helps by establishing a consistent approach that shapes the expectation. Surely there are

other reoccurring unplanned events that could benefit from response planning and advance communication.

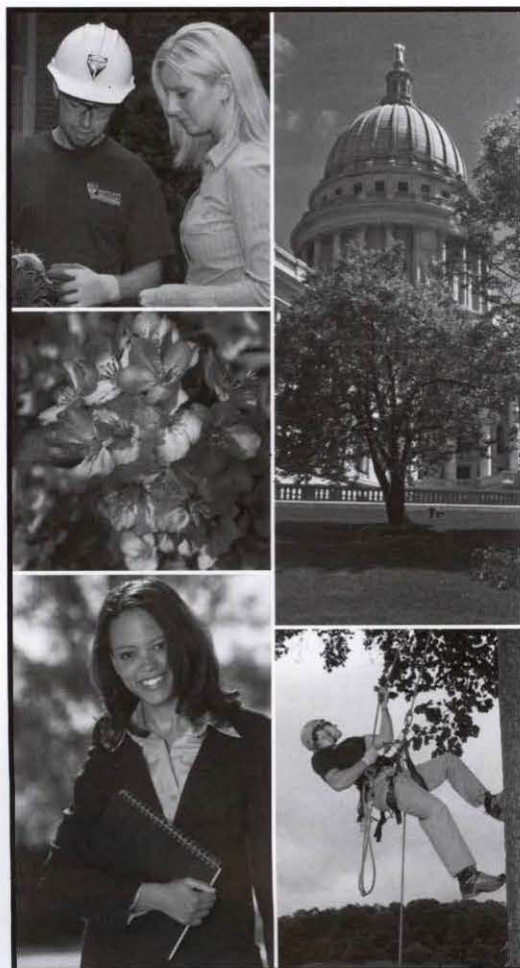
#### **CONSISTENCY AND TIMING MAKE GREAT PARTNERS**

Finally, when time and budget are not on your side, you must rely on timing. Sometimes it is not a matter of doing more with less, we are simply doing less. Reducing services is a necessary part of managing in tough times. Even so, we should still focus on what we are doing more than what we are not doing. With that in mind, it is important to review the schedule for services that are performed for the best timing that provides the most benefits. Services performed too early can degrade, too late simply miss the mark and are wasted. There are a lot of names and phrases that refer to this just-in-time type approach. The one I prefer is "clutch." To be clutch is

to understand the situations and trade-offs and still deliver the service when it matters most: performance under pressure. Every area of a facilities organization has an important timing mechanism. The key is to identify it and manage to it.

In short, consistency is a great friend to customer service organizations like facilities. We should strive to be more consistent by sharpening our anticipation, communication, and management skills. When the demands for our services and the events of the day are more sporadic, we should strive for a method of service delivery that is more responsive than reactive and can be appreciated for its timing and "clutch-ness." 

Joe Whitefield is executive director of facilities services at Middle Tennessee State University, Murfreesboro, TN. He can be reached at [jwhitefi@mtsu.edu](mailto:jwhitefi@mtsu.edu).



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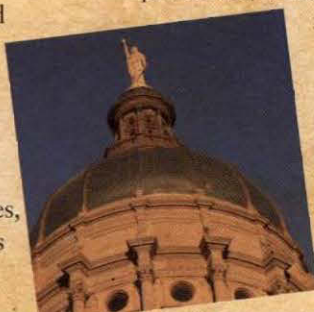
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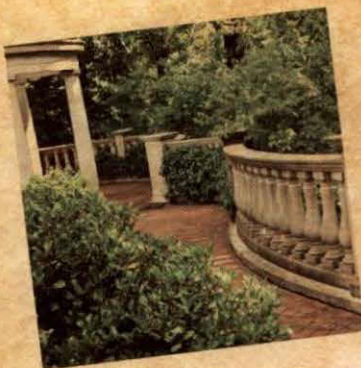
Information technology and communications systems have advanced at unprecedented levels in recent years, creating a "24/7" approach to education that takes students outside of the classroom, and into the internet for instruction, coursework and interaction with faculty and administrators. What is the future impact to capital assets, buildings and infrastructure, and what steps will educational institutions need to take to adjust and succeed in the "next-gen" technology revolution? What will today's campus look like in tomorrow's "non-tethered" learning environment? This session will explore the impact of technology innovation on education, and the role and place of traditional learning over the next 20 years. Hear from a panel of leading education and facility professionals who are adapting their educational institutions for the next stage of learning, research and global competitiveness in education.

# Atlanta



## Balancing Tradition with Innovation: *Is There Room for Both?*

For centuries, a commitment to the traditional and "holistic" learning environment of learning, living and sharing of experiences as one campus community has been a vital component of the institutional mission. But among older learning institutions in particular, educational missions set in place more than a century ago are being challenged by innovation, changing demographics, and new generational expectations of students, as well as expectations of older, returning students seeking to balance work with learning. These changes, coupled with recent economic uncertainties, are placing great stress on the traditional institution model. During this session, a panel of experts and education professionals will examine the sustainability of the traditional education experience and how to strike a balance between old and new that meets the needs of students and the entire campus community.



## Leading the Challenge of Change: *How Facilities Professionals Can Help Repair the Educational Business Model*



Innovation and student expectations -- coupled with economic uncertainties, are placing great stress on the traditional business model for education; resulting in escalating tuition costs, lower funding and reduced services. What corrective measures must be taken to repair the

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Georgia





# ENGAGING »»» OUR COMMUNITY COLLEGES





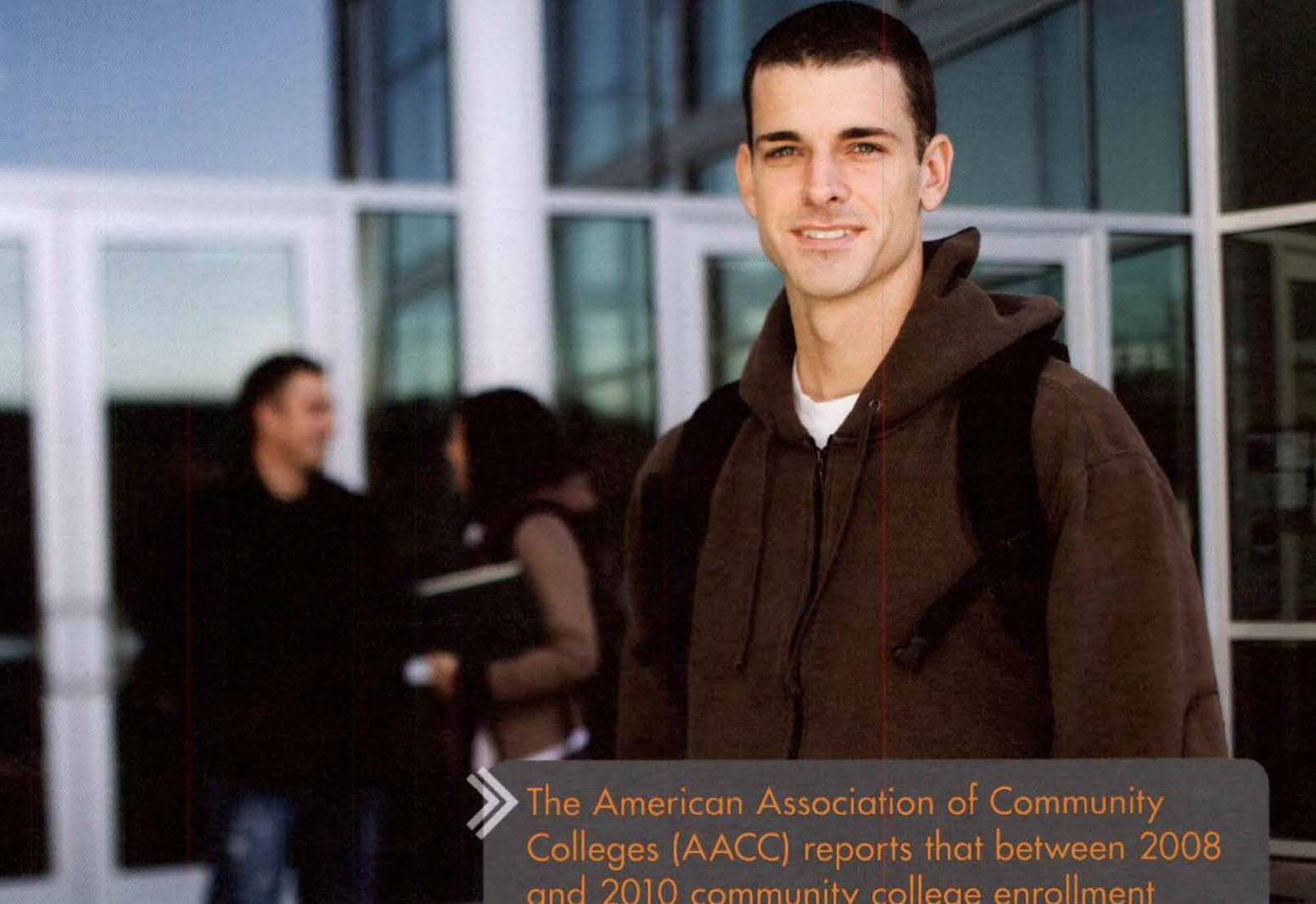
**D**id you know that there are over 12.4 million students enrolled in community colleges across the United States that comprise nearly 1,200 separate public, independent, and tribal institutions? The United States and Canada have a long tradition in recognizing that there are considerable social and economic benefits of providing high quality education to as many people as possible. Community colleges made a significant contribution in expanding educational opportunities for the masses. Attendance at one of these institutions is associated with higher wages, even if a degree is not completed.

As the United States and Canada recover from the global economic crisis that began in 2008, it has become readily apparent that community colleges enjoyed tremendous growth. The American Association of Community Colleges (AACC) reports that between 2008 and 2010 community college enrollment increased an average of 15 percent. The rapid growth of community college enrollment along with the economic downturn has placed a tremendous importance on the operation of the college facilities. Reduced federal and state aid to colleges and universities, increasing concerns over the cost of college education, budget cuts, and future spending issues—targeting spending, major cutbacks, and travel restrictions—are all reasons that community colleges need new and effective leadership more than ever.

#### **DRAW FROM APPA**

Since its founding in 1914, APPA has become a premier association serving diverse memberships of international educational institutions in all areas of facilities management. Given that fact, why are there only 188 institutional community college members within APPA's total membership of nearly 1,500? Could it be that APPA's rich history of providing programs, products, and services designed to increase the effectiveness of the educational facility professional is perceived by many to be designed primarily for colleges and universities that offer baccalaureate, master's, and doctorate degrees? After all, it was not until 1969 that APPA included two-year institutions into its membership. I contend, as an APPA member and a facility professional from a community college for the past 20 years, that being involved with an organization like APPA provides a vast amount of resources to draw from regardless of the type and size of the institution.





» The American Association of Community Colleges (AACC) reports that between 2008 and 2010 community college enrollment increased an average of 15 percent.

APPA leadership has taken action by developing several specific initiatives to increase recruitment and engagement of community colleges.

In May 2010 the president of each of APPA's six regional organizations were asked to recommend a person from its region to serve in a group of Community College "Champions." This group would assist APPA in identifying ways to further engage APPA's community college members and prospective members in APPA activities. Since that time the community college engagement group has been steadily increasing in numbers and has made tremendous strides in developing initiatives to support community college facility professionals. The group is working hard at identifying potential new members within the community college ranks. The potential members have or will receive personal invitations along with follow-up phone calls from the community college champion in their local area pointing out the benefits available through APPA and dates for upcoming events and professional development offerings.

*The organization of a series of state-based or systems-based community college meetings and forums.* A community college state symposium was organized by Bill Ward from Pima Com-

munity College and Polly Pinney from Arizona State University in May 2010. The symposium was promoted as a statewide event where facilities professionals could receive information on relevant issues and gain valuable networking from those in attendance. (Learn more about the Arizona effort in the Membership Matters column on p. 12.) Other community college champions that have been active in promoting and organizing state-based meetings are Joe Wojtysiak from Harrisburg Area Community College in Pennsylvania and JB Messer from Oklahoma Community College in Oklahoma.

*APPA's Facilities Drive-In Workshop* initiative was launched in May 2010 with the first drive-in workshop being held at the Metropolitan Community College in Kansas City, Missouri and sponsored by Tandus Flooring. This program was created to provide the local delivery of professional development and training to educational facilities professionals within a two-hour driving distance to the workshop site; reach out to professionals who may not have access to training and professional development opportunities due to operating budget restrictions or similar constraints; and to encourage networking and engagement of facility professionals within the APPA organization. Since that initial launch






several drive-in workshops have been held at locations around the country including one that was hosted by Alamo Community College and sponsored by Delta Controls in San Antonio, Texas. With many more APPA Drive-In Workshops in the planning stage they provide an excellent way for APPA member institutions to enhance grassroots membership and network within their local vicinity.

**The APPA 2011 Conference**, being held July 16-18 in Atlanta, Georgia, is designing blocks of time for sessions that will focus not only on the needs of community colleges, but for K-12 schools, liberal arts colleges, and other specific groups to ensure the program and content is relevant to the entire community of facilities professionals. A special session will be conducted this summer in Atlanta similar to the APPA 2010 Conference in Boston, Massachusetts where representatives from community colleges met for open discussion designed specifically to determine how APPA can engage and support community colleges facility professionals. Several recommendations of the community college engagement group have been implemented including the creation of an email discussion board for all community colleges and the creation of a mini-survey to solicit suggestions from community colleges on program content and programming for APPA 2011.


**A Plan of Action for 2010-11** was approved by the APPA Board of Directors in July 2010. This plan consisted of seven strategies for the upcoming year. One of those strategies was to recruit and retain several targeted institutional classifications such as Community Colleges, K-12 schools, Historically Black Colleges and Universities, and small liberal arts colleges.


Subsequently the APPA committees (Information and Research, Membership, Professional Affairs, and Professional Development) have been working diligently over the past months on initiatives for APPA to engage and serve these institutional classifications.

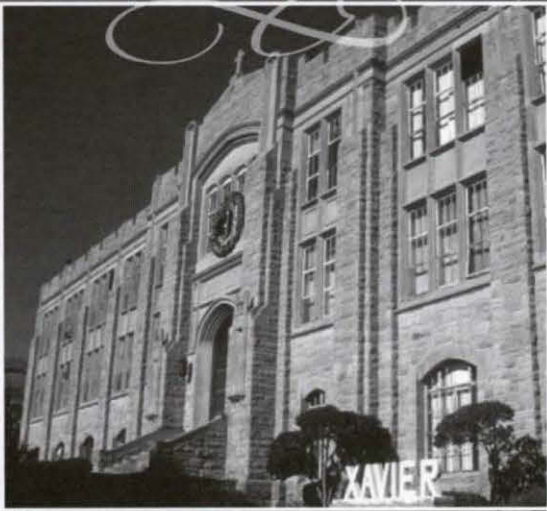
As APPA moves forward in its **Vision**: *To become a global partner in learning by fostering competency, collaboration, credibility for the facilities professional and their organizations in support of the academic mission.* APPA leadership is developing a new APPA strategic plan that will include clear objectives and strategies for meeting the needs of the community college facility professional now and in the future.

Indeed, the future relationship between APPA and community colleges seems bright. It is more important than ever for APPA to be resolute and continue to develop programs based on its strategic plan in these uncertain economic times. Facility professionals from educational institutions need to provide new and effective leadership now more than ever. The broad impact of facilities on an educational institutions success provides an unprecedented opportunity for facility professionals and also new skill set opportunities. With all its history, experience, and professional resources, APPA has taken the role as the professional association of choice for facility professionals and their institutions. 

APPA President Darrel Meyer is director of facility services at Metropolitan Community College, Kansas City, MO. E-mail him at [darrel.meyer@mccck.edu](mailto:darrel.meyer@mccck.edu).








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# Building a Business Case for Going Green

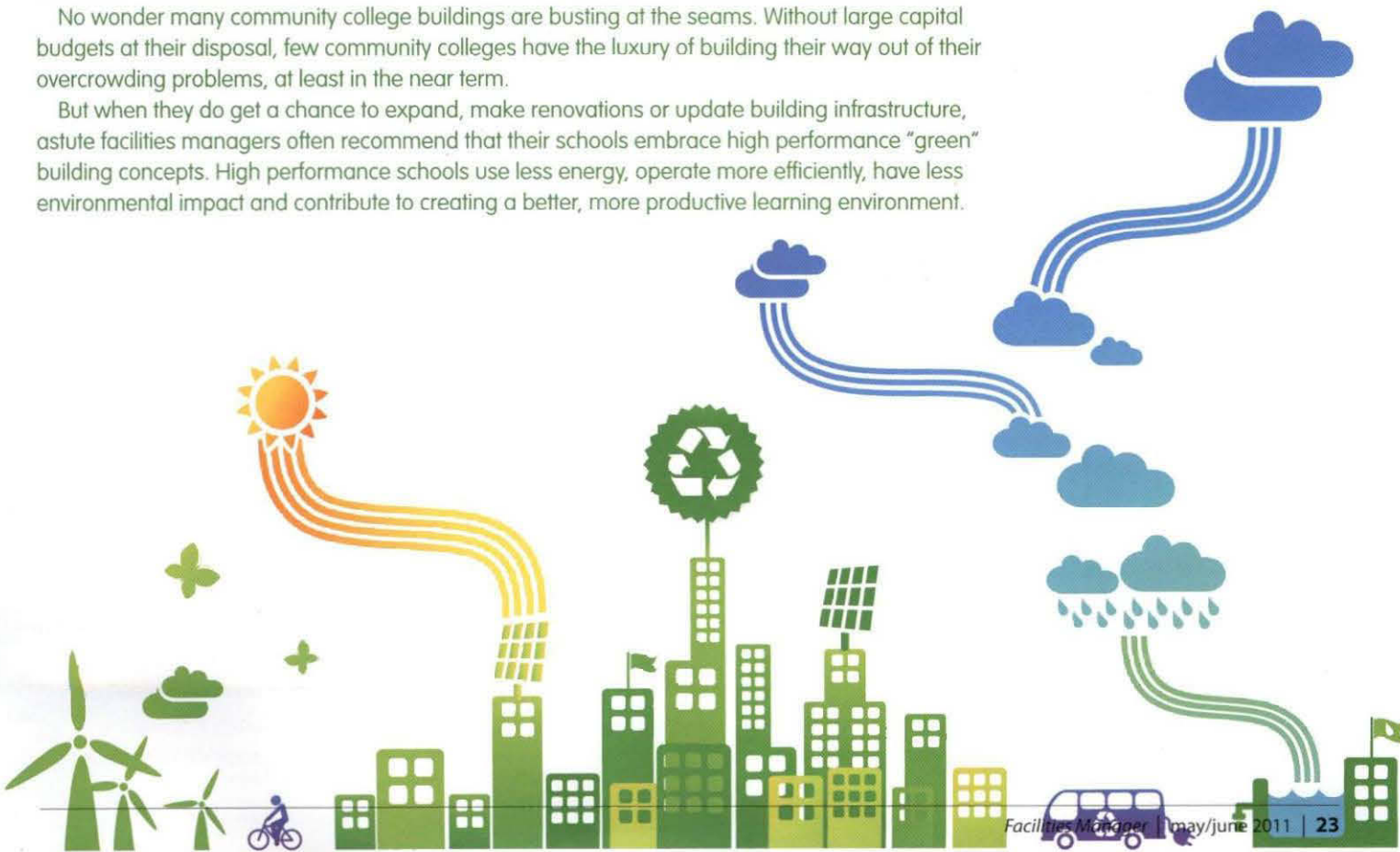
By Bill Harris and Neil Maldeis

Community college enrollments usually rise during tough economic times and the recent recession and slow recovery are no exception. Adults return to school to learn new skills or prepare to change careers and recent high school graduates look for less costly alternatives to a four-year college or university.

In fact, the number of students attending community colleges has grown dramatically in the last decade to about 12.4 million last fall, according to the American Association of Community Colleges (AACC). The AACC says that 1.4 million more students were enrolled in two-year colleges in the fall of 2010 than in the fall of 2007.

No wonder many community college buildings are busting at the seams. Without large capital budgets at their disposal, few community colleges have the luxury of building their way out of their overcrowding problems, at least in the near term.

But when they do get a chance to expand, make renovations or update building infrastructure, astute facilities managers often recommend that their schools embrace high performance "green" building concepts. High performance schools use less energy, operate more efficiently, have less environmental impact and contribute to creating a better, more productive learning environment.







## CAMPUS CONSTRUCTION ACTIVITY MAY BE ON THE UPSWING

In January 2011, the U.S. Department of Labor announced plans to award \$2 billion in grants to community colleges over the next four years as part of the Obama administration's emphasis on increasing the number of "high wage, high skill" jobs in the U.S. In all, the administration plans to invest some \$12 billion in higher education, about \$2.5 billion of which is earmarked for construction projects.

Meanwhile, the National Clearinghouse for Educational Facilities (NCEF) and McGraw Hill Construction expect annual spending on new schools, additions and alterations to increase significantly in the next several years, growing to more than \$70 billion nationwide by the middle of the decade, due in part to pent up demand after several years of slow construction activity.

With more construction likely to take place on community college campuses in the years ahead, facility managers will no doubt play a critical role in helping their organizations make responsible decisions on where and how they invest their capital resources.

Facilities managers are uniquely qualified to recommend building infrastructure and systems solutions that improve their college's ability to achieve its mission and meet the needs of stakeholders in the near term and throughout the long occupied life of campus buildings.

Choosing high performance solutions may result in first costs that are between 0.7 percent and 6.5 percent higher than making conventional choices, according to the U.S. Green Building Council (USGBC). But high performance options pay for themselves many times over during a building's occupied life by reducing energy, operating and maintenance costs. Reducing spending in these areas frees financial resources to support other college priorities.

Just as importantly, high performance school buildings offer a wide range of non-financial benefits including creating a safe, comfortable and efficient place where students, teachers, and staff can do their best work.

## HIGH PERFORMANCE SCHOOLS OFFER SIGNIFICANT COST ADVANTAGES

The high performance schools concept was introduced in the late 1990s. High performance school buildings provide community colleges with a variety of advantages compared to buildings that are designed, constructed, and operated using more traditional building approaches.

For starters, high performance buildings are more energy efficient and cost less to operate and maintain, according to the USGBC, which estimates that life-cycle energy and operational efficiencies yield savings between 20 and 50 percent per year in high performance buildings, compared with conventional buildings.

This performance gap can represent millions of dollars of benefit over a typical community college building's decades-long occupied life. Consider that the National Institute of Building Sciences (NIBS) estimates that operating costs account for

at least 60 percent and often as much as 85 percent of a typical building's total life-cycle costs. So it is critically important that community college decision-makers consider total life-cycle implications – not just first costs – when developing expansion or renovation plans.

## An integrated, life-cycle service strategy that is data-enabled and results-centered helps facilities managers reach and maintain optimum levels of building performance.

Adopting a proactive, knowledge-based service and maintenance approach is key to life-cycle building performance. An integrated, life-cycle service strategy that is data-enabled and results-centered helps facilities managers reach and maintain optimum levels of building performance.

## OPERATIONAL BENEFITS DRIVE MISSION EFFECTIVENESS

High performance schools also deliver operational benefits that are directly linked to an organization's ability to accomplish its primary mission and meet the needs of its stakeholders. For example, high performance schools have been shown to have a positive effect on student performance, attendance, teacher recruitment and retention, occupant satisfaction, brand and reputation, and other factors.

The National Research Council (NRC) found a direct link between indoor air quality, student and teacher health, and absenteeism. The NRC also concluded that improved acoustics and a reduction in noise levels have a positive effect on classroom performance, for both students and teachers.

Adopting a high performance building approach can also add luster to a community college's reputation, improving its image in the community and helping attract students, faculty and other employees. As evidence, a survey by the Princeton Review test preparation company found that two-thirds of students would consider a college's environmental report card before enrolling. To help them choose, the Sierra Club and other organizations publish lists of the most environmentally responsible schools. Meanwhile, a Turner Construction Company poll found that most college administrators and others surveyed believe that "green" colleges improve their chances of attracting and retaining well-qualified faculty members, attracting students, impacting student performance, and securing research funding.

Finally, innovative administrations can integrate high perfor-



mance building concepts into their curriculums. For example, Gateway Technical College in Kenosha, Wisconsin, has developed a “green collar” careers program to prepare students to take jobs in environmental and renewable energy fields. Gateway students are getting hands-on experience as they work on an ongoing program to help install a 60,000 BTU direct exchange geothermal heat pump system that will be providing energy-efficient heating to the campus’ horticulture building.

## BUILDING A CASE FOR HIGH PERFORMANCE COMMUNITY COLLEGE BUILDINGS

With capital project funding still at a premium, community college facility managers will need to build a convincing business case for recommending a high performance building approach on their school’s next construction project.


- **Identify mission-critical factors.** The best business cases link decisions to the college’s mission and objectives. Consider how adopting high performance strategies can contribute to the school’s success by creating an improved learning environment. Also consider how a system failure would negatively impact mission effectiveness.
- **Quantify economic impact.** To the extent possible, estimate the economic impact of each factor on the college. For example, what is the positive impact of reducing absenteeism rates? What is the negative impact of a preventable failure of a building heating, ventilating, and air conditioning (HVAC) system?
- **Conduct a critical building systems audit.** A critical systems audit (CSA) helps facilities managers determine the current level of performance of critical building systems such as HVAC, water, lighting, electrical, mechanical, controls, and instrumentation. Many community colleges engage a third party, such as an energy services company (ESCO) to help conduct their CSA.
- **Gather and analyze energy and operating costs.** An ESCO can help acquire and analyze energy use over a period of several years, which can be compared to aggregate data for similar sized schools and best-in-class facilities. A wide range of benchmarks are available, including the U.S. Energy Information Administration (EIA) Commercial Building Energy Consumption Survey, a nonbiased source of energy information, analysis, and forecasting.

- **Calculate average maintenance costs.** Estimate the average annual cost of planned and unplanned maintenance, using several years of actual cost data, if available. Also calculate the cost of responding to an unplanned failure, including the cost of repairs made in a reactive mode. Consider the disruption to normal operations that an unplanned failure can have and its associated cost.
- **Evaluate operational benefits.** Consider the value added with a high performance approach in such categories as student and teacher performance, productivity, property values, and brand and reputation.

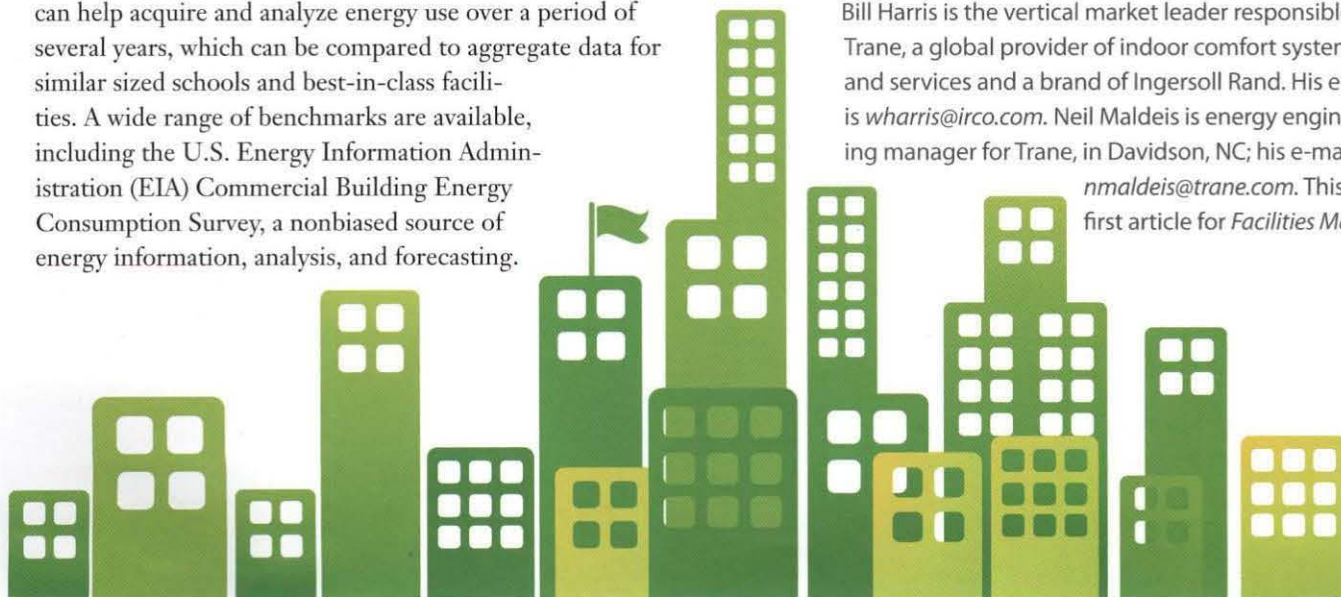
Armed with this information, facilities managers will be well equipped to recommend a high performance schools approach to their next construction project.

The facilities team at Oklahoma City Community College (OCCC) used a comparable approach to develop a plan for major infrastructure improvements supporting the school goals and the needs of a rapidly expanding student body. In partnership with an architect and an ESCO, school officials conducted an energy audit, weighed their options and moved forward on a series of energy conservation measures.

Among other actions, OCCC installed a new building automation system and made improvements to an existing ice storage system. As a result of the project, school officials were able to increase the size of the campus by about 30 percent while reducing energy costs per square foot by about 35 percent.

OCCC’s challenges are not unique among U.S. community colleges. Most campuses are faced with the pressures of growing enrollments and shrinking capital and operating budgets. A high performance schools approach can help administrators and facilities managers meet these challenges head on and focus on their most important mission – creating a better, more comfortable environment for students to learn and professors to teach. 

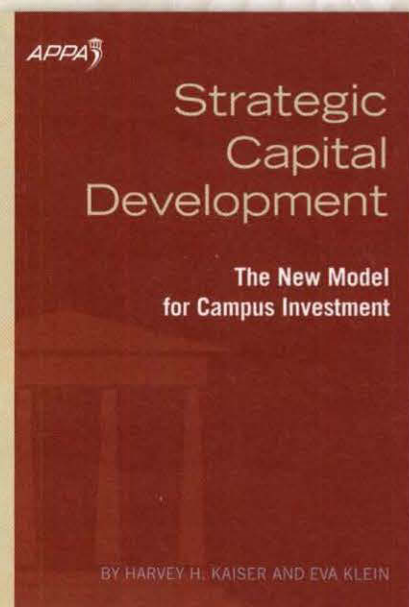
Bill Harris is the vertical market leader responsible for Trane, a global provider of indoor comfort systems and services and a brand of Ingersoll Rand. His e-mail is [wharris@irco.com](mailto:wharris@irco.com). Neil Maldeis is energy engineering manager for Trane, in Davidson, NC; his e-mail is [nmaldeis@trane.com](mailto:nmaldeis@trane.com). This is their first article for *Facilities Manager*.





# Strategic Capital Development: The New Model for Campus Investment

By Harvey H. Kaiser and Eva Klein



**Member price: \$70**  
**Non Member price: \$82**  
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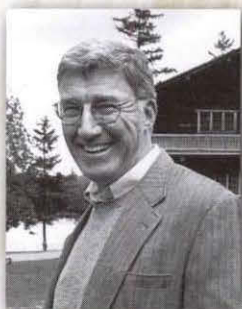
**APPA's newest book, *Strategic Capital Development: The New Model for Campus Investment***, presents a bold approach for planning capital investments from a strategic and long-range perspective. The authors combine their extensive higher education experience, and their specific work of the last decade to improve capital planning and decision-making, to make a case for a new model in which they seek to balance idealism with pragmatism. They define stewardship principles necessary to create and sustain a physical plant that is responsive to institutional strategies and functions; remains attractive to faculty and students; and optimizes available resources.

## **The book is organized into three parts:**

**Part 1**—provides a summary of how capital planning and funding practices in higher education have evolved from the late 1940s to the present—including case studies of relatively more effective planning models.

**Part 2**—makes the authors' case for why change is needed, based on examination of environment/context factors, and articulates six key principles for 21st century facilities stewardship—the foundation for the model.

**Part 3**—provides the proposed model, based on the observations and conclusions in Parts 1 and 2. Following the model overview, Part 3 provides practical, hands-on, how-to details of methodologies and data requirements, along with illustrations of many of these elements.



Harvey H. Kaiser

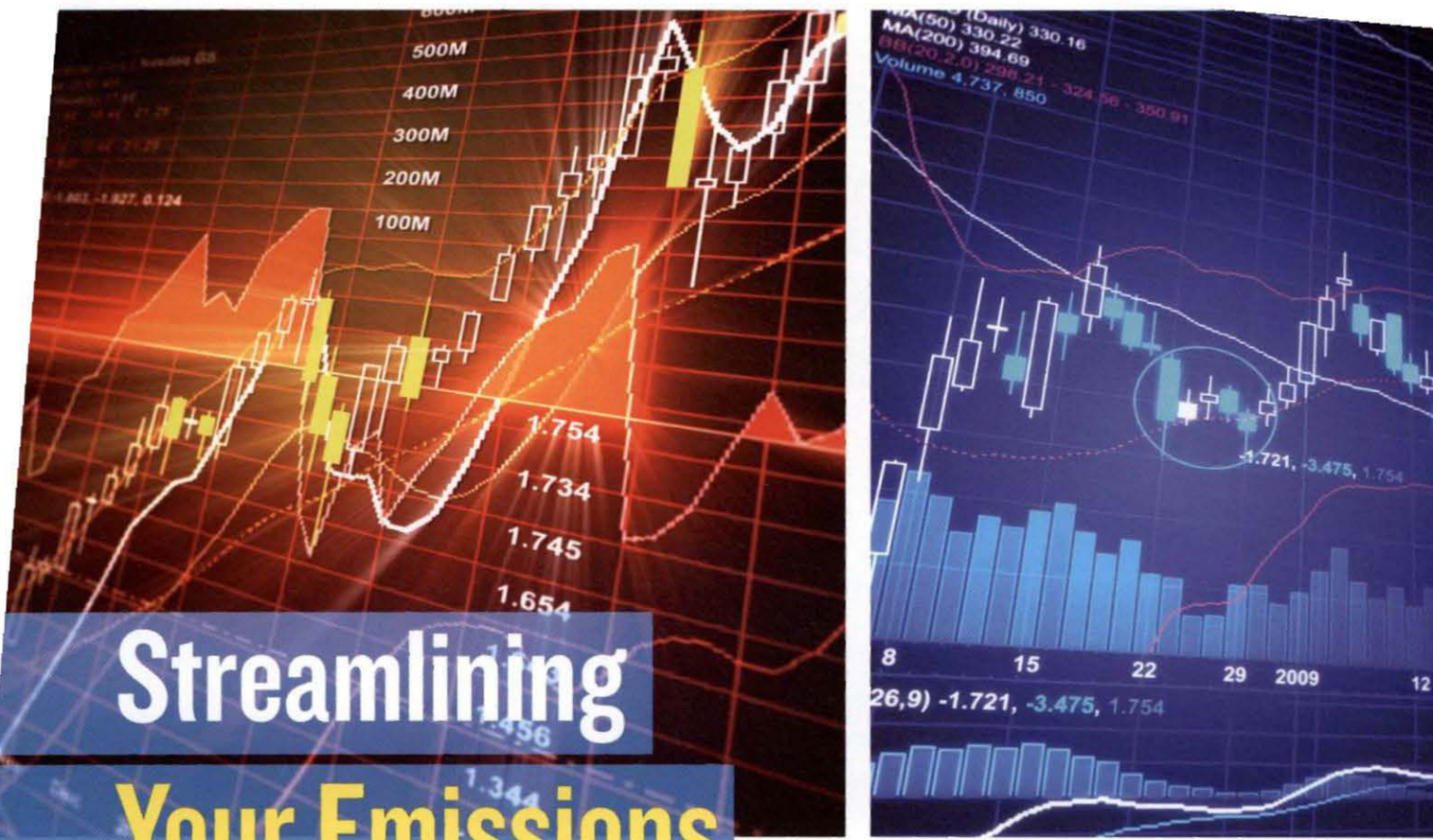


Eva Klein



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# Streamlining Your Emissions

## INVENTORY UPDATES

By John Stokes, LEED AP

Of the 677 school presidents that have signed on to the American College and University Presidents Climate Commitment (ACUPCC), approximately 200 of them are presidents of community colleges.<sup>1</sup> This measure of involvement at the community college level is promising for two reasons: 1) these schools have emerged as a major provider of public higher education, enrolling nearly as many students in their programs as public four-year universities,<sup>2</sup> and 2) community colleges are often uniquely positioned to promote change within and across communities.<sup>3</sup> However, the challenges in meeting the ACUPCC commitments are substantial—for all types of institutions. As reported by Adams, a small number of signatories have actually left the program and many others continue to fall behind the deadlines for submitting required plans and updated emissions inventories. Regardless of the enormous savings needed to meet a neutrality goal, many schools continue to struggle with the basic act of creating and maintaining an accurate emissions inventory.

### THE IMP

Strapped with competing demands, leaders must find ways for small colleges to make the most with few resources. This article revisits the idea of an Inventory Management Plan (IMP)—a somewhat tedious but highly effective tool that can be particularly valuable for community colleges, where there is an elevated need for efficiency and continuity of knowledge from one year to the next.



## THE NEED

As a case in point, a small New England community college created their first ACUPCC Climate Action Plan (CAP). This CAP included an updated GHG inventory that was compared against the original baseline, which had been completed years ago with the help of students who are no longer at the school. The Facilities and Engineering staff remembered using the Clean Air-Cool Planet (CA-CP) calculator tool and even had the old CA-CP spreadsheet containing raw data entries...but they had kept very little in terms of detailed documentation, backup source data files, or supporting calculation methods and assumptions. Upon further review, some inconsistencies were found within the data entries, raising even more questions about the original inventory and how reliably they could draw comparisons moving ahead.

**The IMP should focus more on data quality by establishing reliable systems for data collection and process improvement.**

Like so many schools, they faced the unnecessary challenge of essentially relearning the inventory process, starting back at the beginning. What data had to be collected? What was considered within scope? Where were the boundaries drawn around the campus buildings and transportation fleet? How and where could they find the various pieces of source data on campus? Were those personnel still in their positions? What assumptions were made in calculating the commuter emissions for students and staff? At a time when they could have been quickly updating their previous inventory, it seemed like there were more questions than answers. And with limited resources and time to dedicate toward the task, it took months of digging to relocate much of the underlying data.

This example illustrates the importance of a good IMP to ensure continuity of emissions data and analysis. You should think of an IMP as being separate from a Climate Action Plan, which is primarily focused on identifying emission reduction measures and charting the path toward climate neutrality. The IMP should focus more on data *quality* by establishing reliable systems for data collection and process improvement. In fact, as with the project mentioned above, a CAP might even include the creation of an IMP as one of the initial strategies or measures to be taken by the institution. In other words, build the IMP directly into the action plan.

People often want to rush through the inventory process to “get it done,” not realizing that a poorly or hastily constructed inventory is only a disservice in the long run. The inventory is the foundation of the entire ACUPCC commitment, and a solid foundation needs to be accurate, transparent, repeatable, and easily “update-able.” An IMP helps schools institutionalize this pro-

cess by treating knowledge as a manageable asset and providing a framework for collecting and incorporating new information.

## BASIC CONTENTS

Anyone familiar with the EPA's Climate Leaders program is probably already familiar with the idea of an IMP. While Climate Leaders is being phased out over the course of this year, their guidance is useful for any institution. The EPA highlights seven major sections of an IMP:<sup>4</sup>

- **Institutional Information:** name, address, and inventory contact information
- **Boundary Conditions:** organizational and operational boundary descriptions
- **Emissions Quantification:** quantification methodologies and specific emission factors by year
- **Data Management:** specific data sources, people, and collection processes on campus
- **Base Year:** base year adjustments for structural and methodology changes
- **Management Tools:** roles and responsibilities and file maintenance
- **Auditing & Verification:** auditing, management review, and corrective action

For those just getting started, schools should refer to examples that are available at the ACUPCC website. Many institutions are uploading versions of an IMP along with their inventory data, but they do range in quality and completeness. You can also consider following the Simplified Inventory Management Plan available through the EPA at: <http://www.epa.gov/climateleaders/reporting/index.html#imp>. A Google search will also result in several corporate examples that follow the Climate Leaders model.

While it may seem like the creation of an IMP is an additional burden, most of this information is already being discussed and determined during the initial inventory process. It should not be a huge step to formally document them in an IMP for future use.

## FACILITATING CONSISTENCY AND FINDING TIME


There are several benefits of a thorough IMP. Most importantly, it will help ease the process of maintaining and updating an accurate and comparable emissions inventory. This can be especially important for community colleges that have limited resources and continuous turnover but still need to provide ACUPCC inventories at least every other year.

Consider the fact that many institutions use students to complete their greenhouse gas inventories and climate action plans. Community colleges are facing interesting changes in student populations that are directly relevant to the need for an IMP. Turnover and completion rates are especially challenging at community colleges where students are only enrolled for two years and may not live on campus. Many community colleges have a second year retention rate of 30 percent or less.<sup>5</sup> What



happens to the thread of emissions data when that group of students leaves? At a two-year school, each subsequent inventory update might be the responsibility of an entirely new set of students. Similarly, how will the school transition knowledge and responsibility when or if the facilities or sustainability director retires?

This enforces the need for an IMP to facilitate that turnover and ease the transition from one class to the next or from one administration to the next. Schools can combat student and staff turnover by having a well-planned process with consistent methods for tracking, aggregating, analyzing, and reporting data. The key is to avoid recreating the wheel every time new people are involved. It is worth spending additional effort to establish these tools and processes up front, since it is more expensive and time-consuming to repeatedly reinvent the wheel.

One thing working in favor of community colleges is that—in addition to these challenges—they have become “magnets for a new generation of professionals with new ideas about campus life, involvement, activities, and the culture of the community college.”<sup>6</sup> This suggests there will be a steady stream of willing and active participants. The trick is to use their time most effectively. Time saved while updating the emissions inventory can then be more effectively applied toward generating and implementing meaningful and lasting solutions. 

#### END NOTES:

1. Dan Adams, “Climate commitment reaches crossroads,” *Community College Times*, August 30, 2010, <http://www.communitycollegetimes.com/Pages/Sustainability/Climate-commitment-reaches-crossroads.aspx> (accessed February 22, 2011).
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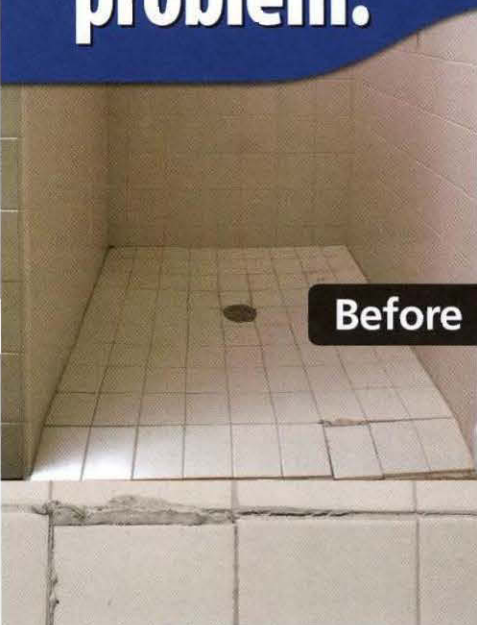
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6. Michael Miller, Myron Pope, and Thomas Steinmann, “A profile of contemporary community college student involvement, technology use, and reliance on selected college life skills,” *College Student Journal* (September 2005). [http://findarticles.com/p/articles/mi\\_m0FCR/is\\_3\\_39/ai\\_n15944505/](http://findarticles.com/p/articles/mi_m0FCR/is_3_39/ai_n15944505/) (accessed March 14, 2011).

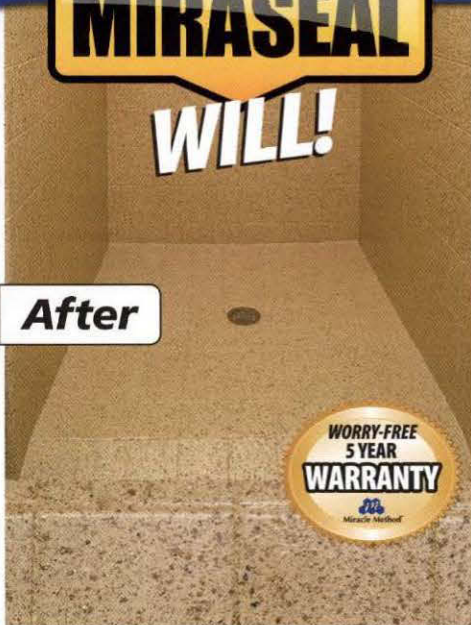
John Stokes is a sustainability specialist with Sebesta Blomberg, Roseville, MN. E-mail him at [jstokes@sebesta.com](mailto:jstokes@sebesta.com). This is his first article for *Facilities Manager*.

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# Initiative

By Carolyn R. Teich

**C**ommitted to fulfilling the promise of the green economy, the American Association of Community Colleges (AACC) launched the Sustainability Education and Economic Development (SEED) initiative ([www.theseedcenter.org](http://www.theseedcenter.org)) in October 2010. The project advances sustainability and clean energy workforce development practices at community colleges by sharing innovative models and resources and building the capacity of college leaders, faculty, and staff to grow the green economy. Through initial funding from The Kresge Foundation and Surda, and support from ecoAmerica, AACC is helping colleges and others navigate an increasingly green world. To date, more than 360 community college presidents have pledged to support the goals of SEED.

The SEED Center includes more than 300 curated green jobs resources, community college program and course descriptions, in-depth success stories, instructional guidance for colleges on developing and advancing green focused programs on campus, and a Wiki to incorporate curricular materials submitted by colleges. Content is updated on a regular basis. As the database grows more robust, it will help college leaders, faculty, and staff plan, implement, and improve their programs and courses. The initial database focuses on solar, wind, green building, energy efficiency, and sustainability education.

According to John Sygielski, chair of the AACC Board of Directors, "Community colleges are inherently positioned to be some of the most influential and impactful organizations to lead the national movement toward sustainability and a greener economy." With more than 1,100 colleges serving over 12.4 million students, colleges are educating and training students for new green jobs as well as the greening of existing jobs. And, they can create a demand for sustainable

products, sustainable behavior, and a sustainable economy.

Over the past year, the AACC Sustainability Task Force consisting of 36 community college presidents chaired by Jerry Weber of the College of Lake County, (IL), crafted a mission and a set of three long-term priority areas for two-year colleges engaged in the green space. The task force identified:

1. workforce development (education and job training for careers in the green economy);
2. community engagement (broadening partnerships with local stakeholders to build sustainable communities; and
3. sustainable colleges (reducing the carbon footprint of college campuses.

By transforming curricula, workforce development, community collaboration, and campus operations, colleges will generate skills, values, and behaviors that will prepare students to participate in a thriving green and sustainable society. The goals are lofty, the rewards are great.



For community colleges, “green” is really about comprehensive change - making sustainability a guiding principle for all institutional educational offerings and practices. It means campuses moving toward carbon neutrality; it means integrating sustainability into campus operations; and it means developing quality green job training opportunities for students and workers.

Three examples of renewable energy programs are illustrative of the scope of community college efforts. Butte College (CA) produces more electricity from on-site solar than any other community college is moving to produce all of their electrical power on site. Mesalands Community College (NM) is home of the North American Wind Research and Training Center (NAWRTC)—the first partnership of its kind between a national energy laboratory (Sandia National Laboratories) and a two-year higher education institution in the country. The Technical College of the Lowcountry (SC) has installed an electrical generator on the Beaufort River to confirm the potential of tidal energy.

#### **STRENGTHS OF COMMUNITY COLLEGES— THEY’RE COLLABORATIVE**

Community colleges are collaborative by nature and sustainability issues provide another opportunity to join other colleges to accomplish their goals. Some of the collaboration includes entire states. Central Carolina Community College (NC) is the Energy Sector lead college for the North Carolina Community College System Code Green Super Curriculum Improvement Project. The college will develop and improve existing curricula in five sectors: energy, transportation, engineering technology,

environment and building. The improvements will be integrated across North Carolina’s 58 community colleges. The Illinois Green Economy Network (IGEN), formerly known as the Illinois Community College Sustainability Network, is a vibrant and growing collaboration between the state’s 48 community colleges. An initiative of the community college Presidents, this network brings community colleges together to expand employment opportunities, improve human and environmental health, foster community engagement and accelerate market competitiveness to drive Illinois’s

emerging green economy. (See p. 35 for more on the Illinois Green Economy Network.)

Other collaborations cross state lines or are national in impact. The NSF-sponsored Advanced Technology Environmental and Energy Center (ATEEC) is headquartered in Iowa, but it reaches across the map. ATEEC’s instructional design team works with education, business, industry, and government clients to analyze gaps and evaluate existing training to provide professional development opportunities for technician educators and technicians. In the environmental and energy technology fields, these opportunities include: program and curriculum development, educator technical training workshops, fellows Institute, peer and

### **Students, staff and faculty learn how to work systemically with the broader community to support the development of a stronger, greener economy.**

technical assistance networking, conferences, forums, webinars, and resource sharing.

Columbia Gorge Community College (OR) formed a regional collaboration with Washington. In addition to orchestrating workforce consortium arrangements between Oregon and Washington state agencies and funders, CGCC was the leader in founding the Columbia Gorge Bi-State Renewable Energy Zone (CGBREZ) to promote and coordinate economic development opportunities across five Oregon and Washington counties. Their wind energy programs are the result of strong collaboration with the wind energy business sector.

#### **STRENGTHS OF COMMUNITY COLLEGES— THEY’RE EVERYWHERE**

Community colleges are ubiquitous, they are positioned to lead and model sustainability. SEED plans to showcase how to use the campus and the community as a living laboratory for sustainability to engage both students and the public in sustainable solutions. Many of the best community college programs create assignments and activities that engage in real world sustainability projects in the local government, business, and nonprofit sectors. Such activities can impact facilities, purchasing and strategic planning, as well as energy production and consumption, and drive the level of environmental and social responsibility in policies and practices. Students, staff and faculty learn how to work systemically with the broader community to support the development of a stronger, greener economy.

Gateway Technical College (WI) created the Center for Sustainable Living, a five-acre property with gardens, orchards, a greenhouse, and an older home that students are retrofitting to meet sustainable energy guidelines. The home will serve as a community showcase in green building construction, remodel-





ing, and geothermal exchange to heat the greenhouse in Wisconsin's extreme winter climate. The students in the Culinary Program will use the greenhouse, gardens, and orchards to produce sustainable and organic foods for on-campus dining.

As the market for green jobs expands, SEED is noting good programs and processes in developing sought after skills for the workforce. As the premier workforce development provider in higher education, community colleges are used to working with businesses to provide the education and training needed to work in various sectors, including which certificates and degrees are required. The new green jobs provide a prime example of multiple certificates arising in new fields. SEED works with government agencies and business groups to assist colleges in determining which certificates are business-driven and which skills are necessary for some of the new jobs. This is a fluid, dynamic process. Green energy sector competencies and recognized credentials allow students of all ages to move in a career pathway.

#### FUTURE PLANS

As part of this effort, AACC recently released a strategic plan for Community Colleges in the Emerging Green Economy: Charting a Course and Leadership Role (posted on the SEED website). The plan expands the workforce development phase to include more efforts to increase community engagement and create more sustainable colleges. Many community colleges have well defined sustainability goals and benchmarks, others have some programs, while others cannot imagine adding another project or program in tight economic times. SEED is designed to assist all colleges on the road to sustainability by providing a forum to understand the challenges, provide technical assistance, provide promising practices, provide resources, and promote the role that community colleges play in a green economy. Webinars, toolkits, and workshops are planned to for the next couple of years to spread the resources. Additionally, scholarship and award opportunities will encourage new endeavors and reward existing work.

AACC works with other higher education associations as well as other organizations to further the sustainability agenda. SEED links to other relevant websites which allows community colleges to benefit in many ways, from scientific research to federal regulations to aligning coursework to secondary and



four-year colleges. Sustainability is an integrative endeavor, with no fixed starting and stopping point. The greater the inclusion of travelers along the path, the greater the chance for a successful journey. We welcome the addition of good practices and suggestions from APPA. ☪

This article was adapted from the SEED Center and *Community College Journal*. Carolyn Teich is senior program associate for economic development at the American Association of Community Colleges, Washington, DC. She can be reached at [cteich@aacc.nche.edu](mailto:cteich@aacc.nche.edu). This is her first article for *Facilities Manager*.

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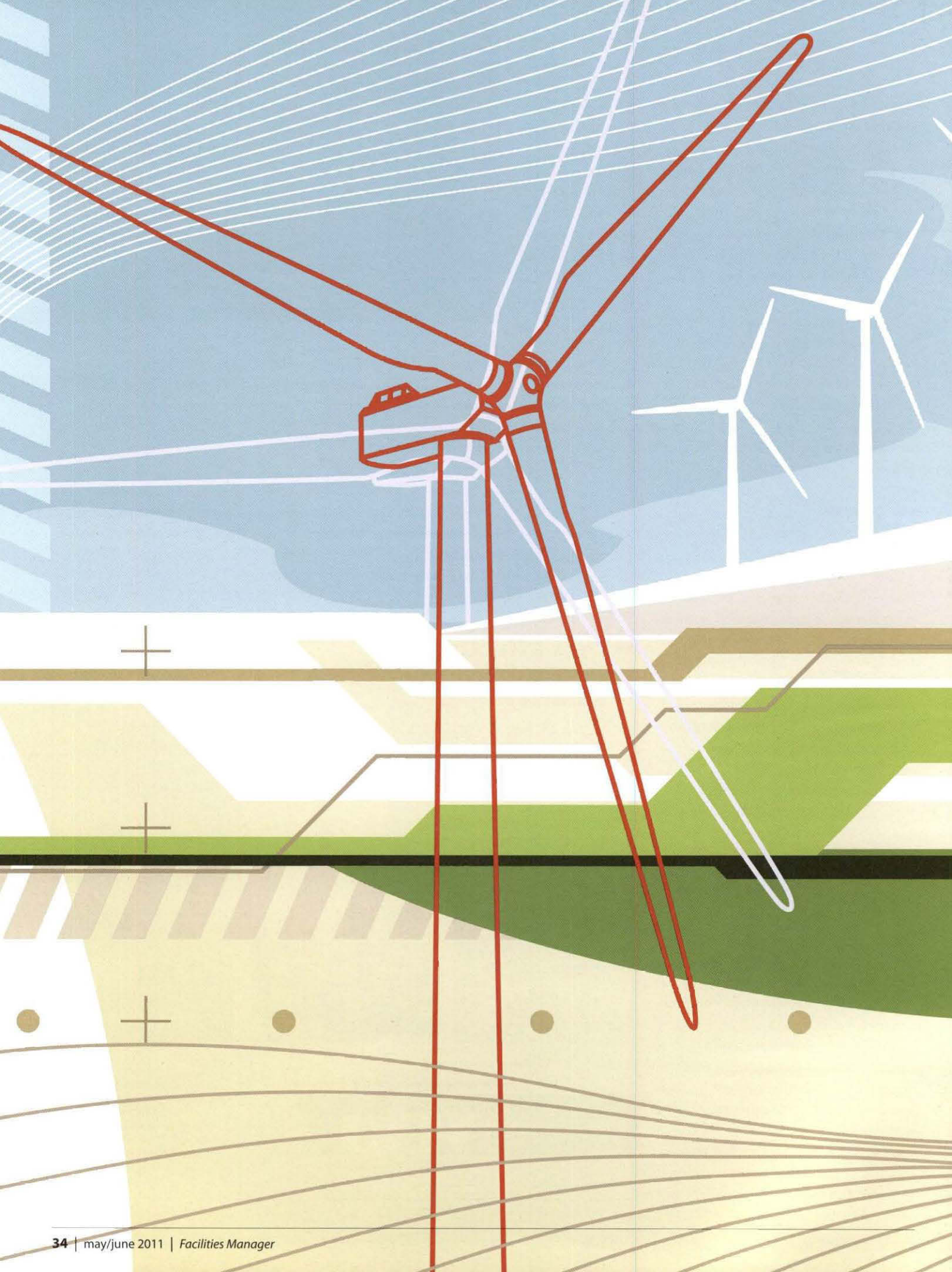


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# The Community College Perspective in the Emerging green economy

By Leith Sharp

**A**lmost half of all students entering higher education now do so through the community college sector. These institutions are a trusted and vital source of education, training, and information for their communities. They are also at the front-line in our society's never ending battle to provide the skills and capacities necessary to ensure our economic, social and environmental well being.

One of today's most important battles involves preparing society for the emerging green economy. The United States is falling behind in realizing the job growth potential that other nations are realizing. Many cost-effective and viable green innovations are failing to take hold due to a lack of related training and education. By addressing this problem, the community college sector will provide a vital stimulus to the green economy.

In Illinois, the community college presidents have created one of the most important green economy initiatives in the country, the **Illinois Green Economy Network**, a partnership of the 48 community colleges of Illinois. See a video clip of our Presidents talking about IGEN at [www.igencc.org](http://www.igencc.org).



This Network brings community colleges together to expand employment opportunities, improve human and environmental health, foster community engagement and accelerate market competitiveness to drive Illinois's emerging green economy. It also provides a vital statewide platform for partnering with government, business, trade organizations, and many others.

Through this Network our 48 colleges are collaborating to offer large numbers of people clear and accelerated education and training pathways into the green economy so that they can take charge of their own future, whatever their age or profession. We are also transforming our own colleges into demonstration facilities and community models for energy efficiency, green building, renewable energy, organic landscaping, waste minimization, and much more. This is the first president-led and statewide community college network of its kind in the U.S.

**The green economy is a larger system or context that will drive a variety of changes in our society, one of which will relate to workforce migration and green job growth.**

#### **THE STRUCTURE OF THE ILLINOIS GREEN ECONOMY NETWORK**

All 48 Illinois community college presidents have signed on as members. A Steering Committee of five presidents and representatives from the Illinois Community College Board provide oversight. IGEN is co-chaired by President Jerry Weber (Kankakee Community College) and President Georgia Costello (Southwestern Illinois College).

IGEN has a coordinating team working across all 48 colleges. We have established 12 college sustainability centers to date with full-time professional staff in each college structured to dedicate 70 percent of their time on the college and 30 percent on Network-related program and service development. We hope to continue to expand the number of centers in coming years. Each sustainability center acts as a hub of sustainability coordination for workforce development, campus, community, and curriculum greening activities. In addition to our college sustainability centers, IGEN has three green economy centers established in three colleges. Green Econ-

omy Centers have a core focus on green workforce and green economic development. For our remaining 36 colleges, IGEN has provided seed funding to each in so they can participate in Network programs, training activities, data collection, and marketing efforts. Our current base annual cost is around \$2.5 million. In FY11, with the support of Illinois Governor Quinn, we received state funding from the Department of Commerce and Economic Opportunity along with two federal appropriations. Going forward, we hope secure additional state funding and support from the utilities of Illinois. In addition, we have applied for a variety of federal grants while also working with corporate sponsors.

#### **WHY IS IGEN IMPORTANT TO ILLINOIS?**

Growing the green economy of this state will have a substantial positive impact on job growth. Data from several states (CA, OR, MI, WA) show that green jobs account for 3 or more percent of their workforce, and that this percentage has been growing rapidly. Illinois is not yet benefiting enough from this opportunity, and some data actually shows a loss of green jobs in this state.

Through IGEN, we are positioning our colleges to drive the green economy by providing statewide access to affordable training and education for the green economy. In a recent survey we found that our 48 colleges are already offering over 412 green economy related certificates, associated degrees, and courses related to energy efficiency (weatherization, auditing etc.), renewable energy (geothermal, solar, wind, biofuels), environmental engineering, green construction, organic farming, green auto mechanics, green IT, green fuels, and more. Prior to the creation of the Network, we found several colleges in the state developing new wind technician certificate programs or environmental engineering associate degrees without knowing about one another. The Network can now connect faculty to one another and support collaborative efforts to develop courses, offer accelerated and flexible online programs with stronger employer involvement and more entrepreneurial content to help grow the state's small business base.

Beyond the creation of new courses and credential, the Network of collaborating college are now infusing sustainability and green economy content into all curriculum, enabling our students to enact informed consumer, workplace, and civic choices. In July 2010 we ran a highly successful train-the-trainer pilot in which we trained 14 college teams to offer a "Green your Curriculum" training program for their faculty. Within three months more than 130 faculty had received the training and have since integrated the new content into their existing courses to the benefit of thousands of students. This pilot will be expanded in the coming semester and is likely to reach a much larger number of faculty again. Visit [www.igencc.org/gyc](http://www.igencc.org/gyc) for more information on this program.

The Network has enabled our colleges to start convening businesses, unions, professional associations, schools, churches,



and community groups within each college district to foster engagement and leadership in growing the green economy of the state. One community college has established a working green committee of over 120 representatives from their local community and businesses. Another has convened a mayoral group focusing on greening the region.

All of our collaborating colleges are working to utilize their campus as sustainability teaching and demonstration facilities, setting an example for the one million people that come through our gates each year. Within our Network, we have LEED platinum certified buildings, one of the largest geothermal systems in the U.S., wind turbines, solar voltaic systems, working organic farms, energy efficient building, recycling and composting programs, electric vehicles, and more. We have an example of almost everything that is possible in relation to greening the campus, but prior to IGEN nobody knew and nobody was sharing the lessons learned. We are sharing these best practices across the collaborating colleges through a variety of peer-to-peer exchanges including webinars, retreats, case studies, and focused training efforts. Recently the Network established a dedicated task force to drive the integration of sustainability into all college strategy plans and campus master plans.

IGEN is less than one year old, and the successes have been many already. We hope that this model will open the way for funding of state networks of this kind in other states. The small investment required to unleash the collaborative potential of the community college sector is one of the best investments the nation can make at this time.

#### THE STRATEGY OF IGEN

America has a long history of meeting its greatest challenges from the community level on up. This is why we are working to drive green economic growth from the regional level up by addressing the four areas detailed below.

**Green Workforce Development:** *Drive Job Growth in the Green Economy*

#### Key Strategies:

1. Provide a variety of new green workforce related online and class taught courses
2. Expand demand for new green services & products by working directly with large businesses and targeted sectors across Illinois to identify and remove related training & education barriers
3. Identify and support key policy instruments that could drive demand for green services & products
4. Support growth in small green business sector to meet demand (In California, 70 percent of new green jobs have been created in the small business sector)
5. Work with business groups to convene new green economy related partnerships and programs

#### **Green Curriculum:** *Preparing Students for Their Role in the Green Economy*

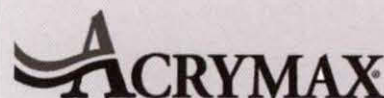
##### Key Strategies:

1. Institute 'Green Your Curriculum' Training for faculty in all Colleges
2. Provide incentives to all faculty to integrate relevant sustainability and green economy content into existing courses (There is potential for it to be integrated into almost all courses)
3. Run an annual state conference to convene faculty, students, and employers to drive progress in greening the curriculum across the state (Plans are underway for the inaugural conference to occur in June, 2011)

#### **Green Campuses:** *Demonstration of the Green Economy in Action*

##### Key Strategies:

1. Institute a targeted energy efficiency program for the Department of Commerce and Economy Opportunity to drive the energy use of our colleges down by ~10 percent within three years
2. Work with campus staff in our 48 member colleges to institute a large number of green campus projects and programs, from green buildings, renewable energy and smart grid applications, electric vehicles, local and organic food, green cleaning, public transportation and more (Almost all of our colleges have signed the Illinois Governors Sustainability Compact)



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**Green Communities:** *Engaging the Community as Partners in the Green Economy*

**Key Strategies:**

1. Our colleges will be the convening platform for a variety of new green community partnerships and programs aimed at fostering engagement and leadership in greening our communities
2. Provide training and education for the community
3. Work in partnership with utilities to drive community energy efficiency

**A NEW ROLE FOR THE COMMUNITY COLLEGE SECTOR**

The green economy and green jobs are often discussed as if they are the same thing. It is important to distinguish between them. The green economy is a larger system or context that will drive a variety of changes in our society, one of which will relate to workforce migration and green job growth.

The relatively slow progress in producing new green jobs is largely the result of our collective failure to ensure that enough of the right conditions, incentives, and drivers are in place at once before pressing forward with any one of the key conditions. In some communities, for example, colleges have done their part in training new solar technicians, only to find that jobs are not there for students because of a lack of regulatory incentives and consumer priorities.

In other communities, political and institutional leaders have pressed for green policy/regulation, still only to find that local business and the general community is not educated adequately to support and/or enact them successfully. In still other communities, businesses have provided new green services only to find that consumers and institutions do not have the right capabilities or training to change their practices fast enough or they are unwilling to make the upfront investment regardless of a guaranteed good payoff. The invaluable lesson to take from these frontier failures is how crucial it is to build up enough of the right conditions before pressing too far forward in any one arena.

For the community college sector to play a meaningful role in driving the emerging green economy to produce green jobs for our students, we must acknowledge and embrace the interdependence that exists between these efforts. If we continue to view our role in the emerging green economy only by way of providing training for a green workforce that may or may not be in demand, we will risk setting our students up for failure.

Initiatives like IGEN are emerging within the community college sector to implement a broader role in transforming communities through: market innovation and demonstration, community values, education and training, financial investment, policy, and regulation. At the national level, the American As-

sociation of Community Colleges recently launched its SEED center, an online platform for sharing curriculum for the green economy, igniting a new level of national collaboration amongst community colleges. Learn more at [www.theseedcenter.org](http://www.theseedcenter.org) and in the article on page 31.

I firmly believe that the community college is one of America's greatest inventions. The two things that stand out amongst their many favorable attributes are their commitment to building great communities and their ability to foster meaningful and productive collaboration to the benefit of all. These attributes will be the foundation of enormous success as our community college sector takes its rightful place as a central player in the nation's emerging green economy. It is a great honor to work with them. ☺

Leith Sharp is the founding executive director of the Illinois Green Economy Network, Grayslake, IL. Prior to taking on this role, she was the founding director of the Harvard Green Campus Initiative (now the Office for Sustainability). E-mail her at [Lsharp@clc.illinois.edu](mailto:Lsharp@clc.illinois.edu). This is her first article for *Facilities Manager*.

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# THREE COMMUNITY COLLEGE CASE STUDIES



1

## The Green Center of Central Pennsylvania

By Joseph Wojtysiak, MSA, CFM, CEFP, and William J. Sutton II, LEED AP

In 2009, HACC, Central Pennsylvania's Community College, and GreenWorks Development formed a partnership to establish the Green Center of Central Pennsylvania. The mission of the center is to serve as the state's preeminent source for education, training and public information about green technologies and sustainable living. The Green Center is housed in the new LEED® Gold building named Campus Square (see photos). Campus Square is regarded as one of the more sustainable buildings to be constructed in the region. The 75,000 square foot building in Midtown Harrisburg has integrated over 30 green building aspects including a roof-mounted 42-kilowatt solar array and a 48-well geothermal HVAC system. The building was also constructed on a brownfield site that was a former gas station. Eleven underground storage tanks were removed and contaminated soils were remediated in order to clean up the area prior to construction.

Inside the Green Center, you will find a plethora of classrooms and training facilities for students of all ages to learn about green technologies. HACC invested nearly one million dollars into renewable energy training equipment. The equipment is made in the U.S. and was purchased from Hampden Engineering in Long Meadow, Massachusetts. The various pieces of equipment include: wind turbines,

solar photo-voltaic arrays, bio-diesel generator and an HVAC heat pump with integrated controls. The equipment is housed on mobile carts that can be used inside, outside, or taken on the road. HACC is planning to partner with the state of Pennsylvania to take the equipment to various locations including K-12 schools and trade expos to show the public the training equipment and educate them on renewable energy.

Also located at the Green Center is a living museum dedicated to teaching visitors about integrating sustainability into their every day lives. The following educational exhibits can be found there: recycling, eco-friendly building materials, water conservation, building weatherization, solar, and energy conservation. Local firms and corporations such as Gannett Fleming, Raudenbush Engineering, Tyco Electronics, and PPL Company (Utility) have partnered with the center as well. They utilize the center to educate their employees and their

customers about sustainability and the work that they do every day to preserve resources. HACC has begun to offer credit and non-credit course work at the Green Center such as a 40- and 60-hour NABSEP (North American Board of Certified Energy Practitioners) approved Solar Training Course, an Energy Auditing Course and an EPA funded Environmental Workforce Development and Job Training





Program. HACC has already placed dozens of students with local firms working in these emerging fields.

Moving forward, HACC is introducing a specialized curriculum where the students will emerge with one of three green degrees in either: Renewable Energy, Green Building Management, or Sustainable Materials and Resource Management. HACC and the Green Center are also reaching out to other organizations internationally such as TAFE University (Sydney, Australia), is the NABCEP training provider for the Berks and Lancaster WIB (Workforce Investment Board), and is now approved as a training provider for Virginia which allows the State to send students to take NABCEP classes. HACC and the Green Center of Central

Pennsylvania plan to continue to grow and teach other colleges/universities how to start similar programs at their facilities and have a positive impact on the environment and their students.

Joe Wojtysiak is senior director of facilities management at Harrisburg Area Community College, Harrisburg, PA; he can be reached at [jrwojtys@hacc.edu](mailto:jrwojtys@hacc.edu). William Sutton is project manager for Wohlsen Construction Company, located in Pennsylvania and Delaware, and board member, Green Building Association of Central Pennsylvania. His e-mail is [wsutton@wohlsen.com](mailto:wsutton@wohlsen.com); this is his first article for *Facilities Manager*. The authors wish to acknowledge the editorial assistance of Julia Knight and Cheryl Deitz.



## Green Efforts at Cleveland State Community College

By Tommy Wright

**C**leveland State Community College is an accredited public comprehensive community college committed to quality education and open access. The college operates within the governance of the Tennessee Board of Regents.

Situated in the scenic corridor of hills and valleys of Southeast Tennessee, Cleveland State presents an attractive atmosphere in which to enjoy varied facets of an educational experience. The community offers an abundance of service facilities and recreational opportunities. The college is located 30 miles northeast of Chattanooga.

Approximately 3,500 credit students and 1,500 non-credit students enroll in a typical fall semester. The credit student population is split about evenly in the choice of transfer or career-technical programs. The average age of all students is 28 years. All persons are welcome at Cleveland State and the student population is non-racially identifiable. There are over 200 employees at the college including more than 70 full-time faculty members.

The 105-acre campus has 10 major buildings housing modern classrooms, laboratories, and a student activity center. Additional features include an excellent library, a multi-media center of emphasis, computer laboratories, a 400-seat theatre, a 3,000-seat gymnasium, and athletic fields and tennis courts. Cleveland State offers classes throughout the five county service area.

Much like every other campus in North America, the budget challenges our campus has faced over the last few years has provided us with an opportunity to think creatively about how we can more efficiently serve the needs of our campus and community. Some examples are as follows.

### PRINTER PLAN

During the 2010-11 academic year, we realized that while employees had been enjoying having their own personal ink jet printers this was becoming costly and inefficient. So, after many cost comparisons and energy studies, we created group print stations and installed more efficient laser printers. As a result, we reduced our overall personal printers from 215 to 40.

### AUTO COMPUTER SHUT DOWN/RESTART

For many years we had asked that all computers be left on over night so that updates could be installed. However, we realized it was extremely inefficient to leave the 750 lab computers and the 215 faculty and staff computers running the whole night when updates only take about one hour. So, during the 2010-11 academic year, we purchased software that would allow us to designate the specific times to shut down and restart our computers. This simply change is estimated to save us roughly \$10,000 per year in energy savings.

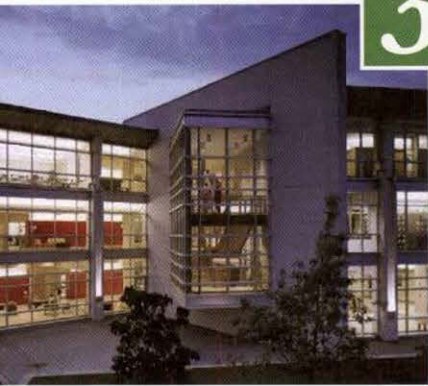
### THE ENERGY CENTER

Through a partnership with our city and county government, the Appalachian Regional Commission, and the U.S. Department of Agriculture Rural Development, we broke ground in February 2011 on an Energy Center, which is an extension of our Business Incubator. This facility will house eight "green" businesses and become home for our alternative fuels academic program. The alternative fuels program plans to use campus-cooking oils to create bio fuel for college vehicles.

For more information about these projects or initiatives, contact the author at [twright04@clevelandstatecc.edu](mailto:twright04@clevelandstatecc.edu).

Dr. Tommy Wright is vice president of finance and administration at Cleveland State Community College, Cleveland, TN; he can be reached at [twright04@clevelandstatecc.edu](mailto:twright04@clevelandstatecc.edu). This is his first article for *Facilities Manager*.





## North Shore's Zero Net Energy Building

By Linda Brantley

**W**hen it opens in fall 2011, North Shore Community College's new Health Professions and Student Services building will be the first state-owned "zero net energy" building in Massachusetts and a prototype of green design that will be used to prepare students with cutting-edge skills for growing healthcare professions.

The \$32 million, 58,000 square foot, three-story project, located just north of Boston in Massachusetts, will save as much energy as it uses through geothermal heating and cooling, solar panels, and smart lighting controls. Zero net energy is a term used to describe a building that is optimally efficient, and over the course of a year, generates energy onsite, using clean renewable resources, in a quantity equal to or greater than the total amount of energy consumed onsite. The building will also meet the requirements of a LEED (Leadership in Energy & Environmental Design) Gold certified building.

The new building, which will also serve as a teaching tool for sustainability, has a green design that will feature LED lighting, Energy Star equipment and smart lighting and controls. The facility will utilize conservation technology and efficiency measures including photovoltaic energy production and the building will have a "green" roof covered in vegetation, "gray" water runoff recovery, and passive solar heating and shading.

Other integrated design components include a south-facing horizontal design, an enhanced building envelope including R-24 to R-30 walls and R-5 windows; chilled beams to provide air conditioning; LED occupancy sensors; solar sun shades and light shelves; and natural ventilation. The building will utilize onsite clean energy technologies, including a 50-well geothermal closed-loop system and 340 kW of solar panels on the roof and in the parking lot. Other "green" design features include a green roof, low-flow fixtures, permeable pavement, and native landscaping. The design, efficiencies, and technologies result in an energy demand of only 27 kBtu per square foot per year for the building—well below a comparable "average" building in this climate, which would require approximately 60 to 80 kBtu/year of energy per square foot.


With utility costs projected at zero, the new super-efficient Health and Student Services Building will: reduce annual grid electricity consumption by approximately 409,000 kWh annually, saving an estimated \$142,000 per year; save roughly \$3.5 million in avoided electricity bills over the next 20 years; and prevent approximately 4,000 metric tons of carbon emissions over the 20-year period (equivalent to eliminating 780 cars from Massachusetts roads or the electricity use of 500 homes).

The facility will enable the college to consolidate all its health programs, offer cutting-edge health and science education and complete its Danvers campus. It will include specially designed space to train students in health programs using the latest in state-of-the-art equipment and technology. Each health discipline will have its own dedicated practice lab and teaching space and will share hands-on simulation suites and control rooms. For instance, one model teaching aspect is there will be a Nurse/ Allied Health Education Sim Lab where students will be able to perform on a "Sim patient" to train with nursing scenario software, and video the training activities. Faculty and students can then review the results and stream "best practices" to other students/classes. This cutting-edge equipment will allow the college to graduate exquisitely prepared students ready to fill real and growing demand for allied health positions.

Plans also include the creation of a high tech nursing reference library, anticipated to become a resource for North Shore health professionals. The new facility will also consolidate NSCC's Student Enrollment Services offices, which combined welcome an estimated 15,000 people every year.

At the October 29, 2009 groundbreaking, NSCC President Wayne M. Burton noted, "Today, we break ground on more than a building. We come together to witness the laying of the cornerstone of a new economic era based on the principles of sustainability and environmental stewardship."

Today President Burton says, "The college is pleased to be on the cutting edge of this movement in Massachusetts. It dovetails perfectly with our internal culture and commitment that North Shore Community College will create an environmentally sound, economically viable, and socially responsible future by advocating the study of sustainability and the application of green principles such as conservation, environmental justice, and green education in our college, communities, and individual lives.

"This core value has resulted in the comprehensive incorporation and integration of environmentally sound practices and programs across the college, from curriculum to energy saving measures, to this new construction. Everyone on the campus is eagerly awaiting the day that the building opens and the implementation of these principles begins in an entirely new way." 

Linda Brantley is director of public relations and new media at North Shore Community College, Danvers, MA; e-mail her at [lbrantle@northshore.edu](mailto:lbrantle@northshore.edu). This is her first article for *Facilities Manager*.





# Focusing on BOK Part 1: General Administration and Management

By Jack Hug, APPA Fellow

The famous phrase *scientia potentia est* is a Latin maxim “For also knowledge itself is power” stated in this form by Sir Francis Bacon, which in modern times is often paraphrased as “knowledge is power.”

The phrase implies that with knowledge or education, one’s potential or abilities in life will certainly increase. Having and sharing knowledge is widely recognized as the basis for improving one’s reputation and influence, thus power.

Ask any group of senior facility officers if they consider knowledge management an important component to the success of their facilities organization, and most will enthusiastically say that they do. Yet, saying that knowledge management is crucial, and knowing what to do about it, are two different things. As Donald Trump has stated, “It is true, knowledge is power, but only if you know how to acquire it.”

## BOK PART 1

The APPA Body of Knowledge (BOK) (the fourth edition of *Facilities Management: A Manual for Plant Administration*) is the source which educational facility managers turn to for acquiring knowledge and information. This new edition does not eliminate or erase the earlier editions, but adds considerably to this most substantial body of authoritative knowledge and information available anywhere.

This article will focus on Part 1: General Administration and Management—The first of APPA’s four Core Competencies.

The chapters that are included in General Administration and Management were not selected at random, but rather chosen as a complementary part of

the more comprehensive and integrated knowledge instrument—the entire APPA BOK. The chapter authors do not attempt to stuff the reader’s head with thoughts and practices of earlier facility innovators, but rather focus on the most current practices and injected their own relevant experience as professional practitioners. Most significantly, the chapters are not written by each author as the absolute *last word* but are rather written to motivate us to expand our knowledge on the subject, and to have at our fingertips when we need a ready reference. This is the source of relevant and useful information to augment our own acquired knowledge on the subject.

A dominant orientation of the general administration and management section is a look inside the facility organization with an eye on the future. It is recognition of two critical practices most apparent in successful facility organizations: management’s critical self-assessment of current organizational capabilities, and an obsession for renewal of organizational capacity. Both practices aimed solely at avoiding organizational decay and aimed at positioning the organization for adapting to changing requirements. Achieving this requires insight and understanding of the facility department’s knowledge: subject matter strengths and weaknesses.

The successful use of the facility management knowledge resources begins with a clear understanding of the know-how that resides in the department. The General Administration and Management Section subject matter (leadership, communication, strategy, human resources, staff development, change management, organization, information management,

financial analysis, accounting, and facilities business management) align perfectly with the general administration and management core competencies.

These core competencies are an absolutely essential component to the organizations foundation for creating value. In essence they represent *life-supporting services* for the organization by providing support and assistance to others delivering facility management services. Mastering the core competencies for general administration and management are also a way of making those who are delivering daily facility services to the campus aware of the working knowledge pool that exists in the organization, and aware of the knowledge links that are essential to improve processes, services, and customer relationships.

## A SIGN OF THE TIMES

Every facilities management organization is already sitting on a vast storehouse of knowledge, but much of it is underused. Organizations that are *APPA Active* and use the Body of Knowledge (BOK) within an organizational environment that fosters a desire for knowledge are organizations that have earned the reputation for regularly making attempts to do things faster, cheaper, and better. In today’s changing campus economy, the key to faster, cheaper, and better is to bring the full force of the organization’s knowledge to bear on the effort. Knowledge has become the lifeblood of a successful facilities organization. Know where and how to acquire it. ①

Jack Hug is past APPA President and is president of Hug Consulting Services, Colorado Springs, CO. He can be reached at [jackhug1@comcast.net](mailto:jackhug1@comcast.net).



# Power Tools - Real World Solutions to Your Toughest Energy Challenges

By William C. Johnson

*Energy-related conversations often invite information overload – and not a lot of solutions. Our purpose for this new column is, instead, to engage multiple voices from among our ranks to bring fresh insight and real knowledge from the trenches on what's working in planning and implementation for energy-related projects. The issue is so far reaching within your everyday facility planning/management world that hearing about successful, do-able solutions will hopefully be helpful and encouraging.*

## AN INTRODUCTION

I'd like to introduce myself and tell you just a little about the mosaic of experiences that has prepared me to lead this effort. I received my B.S. in civil engineering from Northeastern University in 1975. After graduation I worked in solar energy research and development, as well as plant engineering and energy conservation. Honeywell Inc. was a stop along the way, where I was an account manager for three years and learned more about control systems and the business development process than I ever thought possible. My next stop was at AIG Inc., where I was a facility manager for over 600K sf of office space in four states. I dealt with the full gamut of issues from energy, hazardous waste, moves/adds/changes, asbestos, construction and design to every type of building system upgrade known to man. While at AIG, I became one of the first 50 Certified Facility Managers (CFM) through IFMA and have maintained this certification since. For the past almost 20 years I have been working within the higher educational community for various architectural and engineering

firms in a business development function, frequently involved with our clients in needs identification, program design and presentations to trustees. I'm actively involved in numerous organizations from APPA, IFMA, NACUBO, SCUP, ASHE, and IDEA to my most recent involvement as a board member with Second Nature Inc., the co-creator and current implementation arm for the ACUPCC.

I've been around higher education for a long time and have developed a wonderful national network of extremely bright individuals whom I'll call upon to help me keep you informed for this column!

## THE GOAL

My goal with this column is to bring you unique planning, design, and implementation solutions to energy-related issues courtesy of my network. I've heard so many good ideas across the country and over the years about how to get the best return on energy investment. And I've always thought that a lot of people would love to hear about the insights of their fellow facility professionals. In some cases they're simple solutions to tough questions we all share! You will be hearing from a range of experienced institutional energy managers and consultants on these issues and you will be provided with the appropriate contact information to continue your conversations off-line, as you see fit.

These nuggets might involve energy master planning (like how to write an RFP to get what you want versus "get what you get,") to greenhouse gas planning (like how to wrestle this one to the ground and actually come up with a plan when 85

percent of your emissions come from central plant facilities), to individual building metering so that you can actually manage-what-you-can-measure (and how to get this great idea funded outside of a building project,) to how to come up with an organized solution to buying energy (and how to put an RFP together for energy supplier consultants to help you) – just to name a few of the issues you are dealing with.

To get you started with a nugget, take a look at what Wendell Brase of the University of California has been learning about server room energy management in relation to operating temperature conditions and the impacts of this and other issues on carbon footprint reduction strategies. He's a great resource!

<http://www.educause.edu/Community/MemDir/Profiles/WendellCBrase/69421>

## MAKING IT APPLICABLE

Another goal of mine will be to no matter what the subject, make it applicable to a variety of institutional profiles from large to small and public to private trying to provide specific scalable ideas you can use, right now!

So, that's what I'm going to try to accomplish with this column. I pledge that it won't be dull and boring and if you think it is I encourage you to call/e-mail/text/ping me and tell me so, you won't hurt my feelings...remember, I've been doing business development for 20 years...I can take the heat and welcome your input on subjects you want covered. ☺

Bill Johnson is vice president at Haley & Aldrich Inc. in Manchester, NH. He can be reached at [wjohnson@haleyaldrich.com](mailto:wjohnson@haleyaldrich.com).



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*Chuck Price • Director Student Union  
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# Practical Documents For Campus Security: NFPA 730 and 731

By Michael A. Anthony P.E., and Richard J. Davis, P.E. J.D.

**A**PPA members and higher education leaders should be aware of two NFPA (National Fire Protection Association) documents regarding campus security: one is a “guide” and the other is a “standard.” For the education facilities industry, the differences are important. The standard, NFPA 731, is written in code language, and may be adopted by states and local jurisdictions as such. It is also prescriptive and is essentially a “how to” document. However, the guide, NFPA 730, may be the more important of the two because it may affect campus construction details, manage-

ment planning, and campus liability if it becomes the de-facto leading practice document for campus security. It is the document that explains the scope of security planning, or the “what to” do. Together they are important for the following reasons:

- They may become enforceable law if they are adopted by state and local government.
- States may reference them in school design guidelines.
- They may be adopted by insurance companies or risk managers as property loss prevention programs.
- They may be used by plaintiff’s counsel as a standard of care, thereby establishing a duty owed by colleges and university to victims of crime in actions by the victims against the university or college.
- They may compete with specialized real estate or build-

ing security interest groups who want the document they produce to be the leading practice document for our industry.

With some estimates placing the award for verdicts and settlements in excess of \$1.2 million<sup>1</sup>, APPA’s Code Advocacy Task Force would like to help campuses reduce and manage risks in an environment of appropriate codes and standards.

NFPA 730 is much more relevant for campus security than *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs*. NFPA 1600 was correctly referenced in a 2009 report by NACUBO titled, “Campus Safety and Security Project.”<sup>2</sup> The article included discussion and information on events that could be viewed as both disasters and security challenges. However, crime is always a security issue but may not rise to the level of a disaster in all cases.



**NFPA 730** - Guide on Premises Security. This guide describes construction, protection, occupancy features, and practices intended to reduce security vulnerabilities to life and property. The genesis of NFPA 730 was a request by the insurance industry in 1994 to develop a burglary and security document. The project did not materialize until 2000, when the NFPA Standards Council appointed a committee to develop a premises security document. The starting roster of technical experts delivered NFPA 730 and 731.

As a guide, NFPA 730 is advisory or informative in nature and contains only non-mandatory provisions. Although a guide may contain mandatory provisions—not the least of which deal with when and where it applies—the document is not suitable for adoption in its present form by reference in a public statute.




Another document, *Risk Analysis Standard for Natural and Man-Made Hazards to Higher Education Institutions*<sup>3</sup> developed by the American Society for Mechanical Engineering (ASME), issued in 2010, is a relatively new document in the campus security space that will be examined by the CATF for applicability to our industry and likelihood of adoption by relevant agencies. Until that time, the documents APPA members need to be watching regarding security are NFPA 730 and 731. Additional information on the work of the Code Advocacy Task Force can be found on the APPA website.<sup>4</sup>

## SUMMARY

Writers of model law documents must always steer their thinking between two extremes: making a consensus document a commercial prospect by creating a general document that can be used and adopted by everyone; versus incorporating extremely specific provisions that may become obsolete quickly and may not be suitable for broad adoption.

The outcome can be the document is so general that it is useless in guiding an industry toward practical solutions. NFPA 730 and 731 are not perfect documents. However, they have been developed by the NFPA's procedures conforming to the American National Standards Institute's process

for consensus documents and are on solid ground. They can be improved and form a suitable platform for that work. For colleges and universities, the existing structure is useful and worth building upon. 

## REFERENCES:

- 1 "NFPA 730 & 731 New Premises Security System Standard Strives to Make the World a Safer Place", Jim Lardear, *NEC Digest*, February 2005, National Fire Protection Association, Quincy, MA
- 2 "Results of the National Campus Safety and Security Project" Report by the National Association of College and University Business Officers (NACUBO), July 2009. <http://www.nacubo.org/Documents/Initiatives/CSSPSurveyResults.pdf>
- 3 *Risk Analysis Standards for Natural and Man-Made Hazards to Higher Education Institutions*, American Society of Mechanical Engineers Innovative Technology Institute (ASME-ITI) - 2010 [http://www.asme-iti.org/Initiatives/Higher\\_Education.cfm](http://www.asme-iti.org/Initiatives/Higher_Education.cfm)
- 4 APPA Code Advocacy Task Force Transcripts: <http://appa.org/standards.cfm>

Mike Anthony is a senior electrical engineer at the University of Michigan. He can be reached at [maanthon@umich.edu](mailto:maanthon@umich.edu). Richard Davis is the facilities engineer at Evergreen State College and can be reached at [davisr@evergreen.edu](mailto:davisr@evergreen.edu). The authors would like to extend their gratitude to Anne Gross at NACUBO for her comments on this article.

**NFPA 731** - Standard for the Installation of Electronic Premises Security Systems. This standard covers the application, location, installation, performance, testing, and maintenance of electronic premises security systems and their components.

By comparison, NFPA 731, a standard, is a document that contains only mandatory provisions, using the word "shall" to indicate requirements, and which is in a form generally suitable for mandatory reference by another standard or code. It may be adopted into law. Non-mandatory provisions are located in an appendix or annex, footnote, or advisory note and are not considered a part of the requirements of the standard.

Even though NFPA 730 was not written to be enforceable and is crafted in non-mandatory language, it may have the practical effect of increasing APPA member liability exposure because it is the only document developed according to a true ANSI process that contains a dedicated chapter on security in educational facilities.

NFPA 730, Guide for Premises Security, 2011 Edition
About NFPA 730
Chapter 1 Administration
Chapter 2 Referenced Publications
Chapter 3 Definitions
Chapter 4 General
Chapter 5 Security Planning
Chapter 6 Administrative Controls
Chapter 7 Security Perimeters
Chapter 8 Crime Prevention Through Environmental Design
Chapter 9 Security Systems
Chapter 10 Accessory Property
<b>Chapter 11 Educational Facilities, Colleges, and Universities</b>
Chapter 12 Health Care
Chapter 13 Reserved
Chapter 14 Lodging
Chapter 15 Multi-Dwelling Unit
Chapter 16 Restaurants
Chapter 17 Shopping Centers
Chapter 18 Retail Establishments
Chapter 19 Office Buildings
Chapter 20 Industrial Facilities
Annex A Explanatory Material
Annex B Homeland Security Advisory System
Annex C Critical Infrastructure Protection
Annex D Special Events
Annex E Special Topics
Annex F Sample Forms
Annex G Informational References

Proposals for the 2013 revision of NFPA 730 & 731 are due May 24, 2012. Feel free to communicate with anyone on the Code Advocacy Task Force regarding any ideas you would like to contribute to these documents.





Book Review Editor: Theodore J. Weidner, Ph.D., P.E., AIA

**This month I'll cover three books** discussing the environment and the challenges we face due to water issues. Two books by the same author (one older than the other) address water issues, while the third is more general in nature.

All present some alarming facts about how we live within the environment and how the unintended consequences of our decisions—either self-serving or societal—demonstrate that more global, long term solutions are needed.

#### **WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS**

Robert Glennon, Island Press, Washington, DC, 2002, 224 pages, hardcover, \$44.78; softcover, \$18.57.

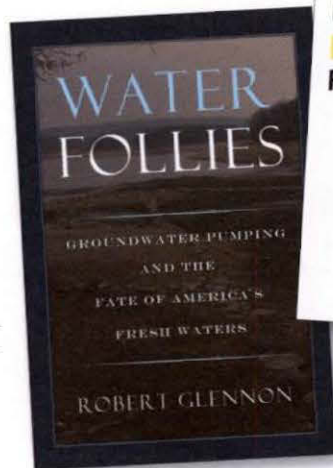
#### **UNQUENCHABLE: AMERICA'S WATER CRISIS AND WHAT TO DO ABOUT IT**

Robert Glennon, Island Press, Washington, DC, 2009, 432 pages, hardcover, \$27.95; softcover, \$19.95; and Kindle, \$9.99.

Some states have a lot of fresh water, while others are highly dependent on ground or importation from others. We typically look at the states with limited water supplies in the middle of the country and mountain west as being the only ones affected by water problems. Despite that, recent events in the southeast and in other "wet" areas prove that no area is immune to water problems. Robert Glennon, professor of law and public policy at the University of Arizona, illustrates these problems at length in both *Water Follies* and *Unquenchable*.

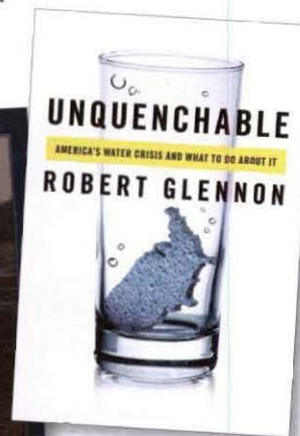
I grew up in Ohio, not far from Lake Erie and went to college along the Hudson River. Both locations had plenty of water. And in fact, the industrial revolu-

tion of the 1800's thrived along the Hudson due to the availability of water for transportation and power to operate the mills before the widespread use of electricity. The availability of water was not an issue because there was plenty of it due to spring rains which sometimes even caused damage due to too much water. Then I moved to the center of the nation where my sensitivity to water issues increased because water is not quite so plentiful.



Little did I realize that I should have been sensitive to water issues regardless of where I lived.

Glennon concentrates on groundwater in *Water Follies*: where and how it is being used and how it affects surface water. Many think of groundwater as being separate from surface water, and that wells drawing water from aquifers do not affect rivers and streams and vice versa. While not a hydrologist, Glennon demonstrates through numerous examples that pumping water from a well in a river basin, even relatively far from the river, affects the amount of water in the river. In Nebraska, we've had a long-standing disagreement with Colorado and Kansas over the use of water in the Republican River basin. The disagreement centers



on wells for the irrigation of crops in Colorado and Nebraska affecting the availability of water downstream in Nebraska and Kansas either from with river or groundwater. It's a big issue because the western half of Nebraska relies on irrigation to grow crops (as does Kansas.) The issue is not limited to drier areas as Glennon demonstrates with examples in Florida, Georgia,

Maine, Massachusetts, and Minnesota (the land of Ten Thousand Lakes). None of these states are outwardly perceived as having water problems.

As a second volume in his chronicle of water issues, in *Unquenchable* Glennon opens with the value of water for entertainment, and the lengths different regions of the country will go to in order to meet the demands for water. Dry regions accustomed to paying for water will offer to pay more to address their growth needs. Those unaccustomed to paying will resort to other tactics. In the middle, entrepreneurs package the same water and then charge prices exceeding that of gasoline (for the time being.) How crazy is that? It really won't be long before a different kind of Alaska Pipeline gets constructed to address the water demands of dry, heavily populated parts of this country.

There were times reading these books I felt that Glennon was providing too many details, taking too long to develop the scenarios, and not getting to the point. However, each chapter presents a different part of the country with water problems, and a brief history of how the problem developed. Despite that the lengthy details, I found both books compelling and informative. Reading between the lines one can see there are answers other than short-term, MBA-



like solutions. They do involve shared commitment to the solution, mostly by consumers. However, as long as the shopping public is willing to pay a significant premium for “spring” water over tap water, we will always have some water issues to resolve.

## GREEN GONE WRONG: HOW OUR ECONOMY IS UNDERMINING THE ENVIRONMENTAL REVOLUTION

Heather Rogers, Simon and Schuster, New York, NY, 2010, 126 pages, hardcover, \$26.00, Kindle, \$9.95.

Nearly fifty years ago, Rachel Carson wrote *Silent Spring* and highlighted the problems facing the environment as a result of man’s attempts to exert some control on nature and utilize chemicals to eliminate pests that harm crops and spread disease. It took a while, but the EPA was created, laws were written or changed, and regulations were promulgated to eliminate the consequences of short-term thinking about environment. In *Green Gone Wrong*, Rogers identifies a number of areas where the laws and regulations continue to do harm even though they were originally conceived as being the right thing to do.

Our environment is a wonderful and creative system. It provides for diverse life forms that support or harm our existence. While it changes over time allowing the evolution of living forms to respond to external influences such as weather, pests, and resources, the environment may not respond as we presumed it would when we made human decisions about how to preserve and maintain it.

Divided into three major parts: Food, Shelter, and Transportation, Rogers explains how current policies have been followed by business people but haven’t yielded the desired results. Whether it is organic food labeling rules that actually

encourage large scale farming techniques (monocropping) that drive the true, small scale, organic farmer out of the market; lighting that requires households develop hazardous waste handling practices (mercury spill containment) previously reserved for business; or fuel

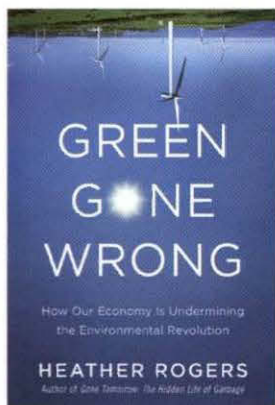
economy rules which result in greater consumption of energy (biofuels); decisions that were made with the intent to preserve the environment now appear to be less than wise.

Rogers does not disassemble the entire environmental apparatus. There are numerous examples of good and effective practices presented. However, there is a clear problem with decisions made by well-intentioned people—either independently or influenced by lobby-

ists—that don’t make sense given the recorded outcomes. In the end, Rogers is pragmatic but short on solutions; these are not problems resolved by a single person. A balance of economy, ecology, and society can be incorporated in a successful business or lifestyle. Whether it works globally or not will be measured by others who are committed to a global measuring stick; who unfortunately, are not usually the decision makers.

Looking at issues not addressed by Rogers, there may be upcoming unintended consequences for us, such as the recent problem identified in San Francisco where low flow toilets are now contributing to issues with waste water transport and treatment. ☹

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**Schweitzer Engineering Laboratories, Inc.** recently announced a price reduction of 20 percent on its popular SEL-3354 Embedded Automation Computing Platform. The SEL-3354's new lower base price results from improved manufacturability and quantities of scale. As part of SEL's commitment to lead the industry in price, quality, features, innovation, delivery, and service, the company constantly strives to reduce the cost of product development and manufacture in ways that also



improve product quality. The SEL-3354 is designed to withstand the harsh environments and temperatures of utility substations and industrial control and automation systems. By eliminating all moving parts, including rotating hard drives and fans, and by automatically correcting soft bit errors at run time with ECC memory, the SEL-3354 achieves a mean time between failures (MTBF) of over 100 years. This is ten times the MTBF of typical industrial computers. For greater detail visit Schweitzer Engineering Laboratories at [www.selinc.com](http://www.selinc.com).

**Schwank** announces the launch of sportSchwank a gas-fired infrared luminous heater for stadiums and outdoor venues. It has been impossible to provide outdoor comfort heat to spectators in open air stadiums, however the sportSchwank luminous heater is the infrared-heating solution to overcome open-air conditions and comfort the fans. sportSchwank has been engineered to meet the exacting heating requirements of stadiums, sports arenas and outdoor venues. sportSchwank can be installed up to 180 feet high for added comfort without affecting spectators view or range of movement, while keeping them comfortable even in cold climate conditions. This proven technology has been used for many years by Schwank in Europe at several open air soccer stadium projects. For additional details visit Schwank at [www.schwankgroup.com](http://www.schwankgroup.com).

**Brush and Clean** announced the release of their new Hybrid Pro Carpet & Hard Floor Cleaner. Available in two models, the Pro Hybrid 35 and 45, the new cleaner is designed to effectively clean both hard flooring and carpet, the innovative system utilizes counter-rotating brushes to scrub and actively lift dirt, grime and cleaning compound to instantly produce dry, clean surfaces. An ideal cost-effective solution for commercial spaces that have both carpet and hard floors the Hybrid Pro Carpet & Hard Floor Cleaner's unique all-in-one design offers an unequalled level of versatility with its ability to clean profiled floors, PVC, tile, grout, natural stone, rubberized, and non-slip safety floors, as well as carpet. The system is offered in two sizes with cleaning capacities of up to 6,000 square feet/ hr on carpets and 9,000 square feet/ hr of hard floors. The capacities can also be doubled by twinning the machines. For more information, please visit Brush and Clean at [www.brushandclean.com](http://www.brushandclean.com).





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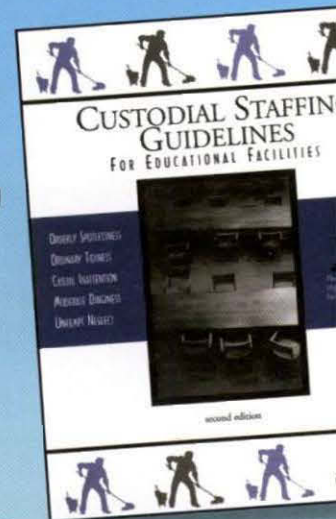
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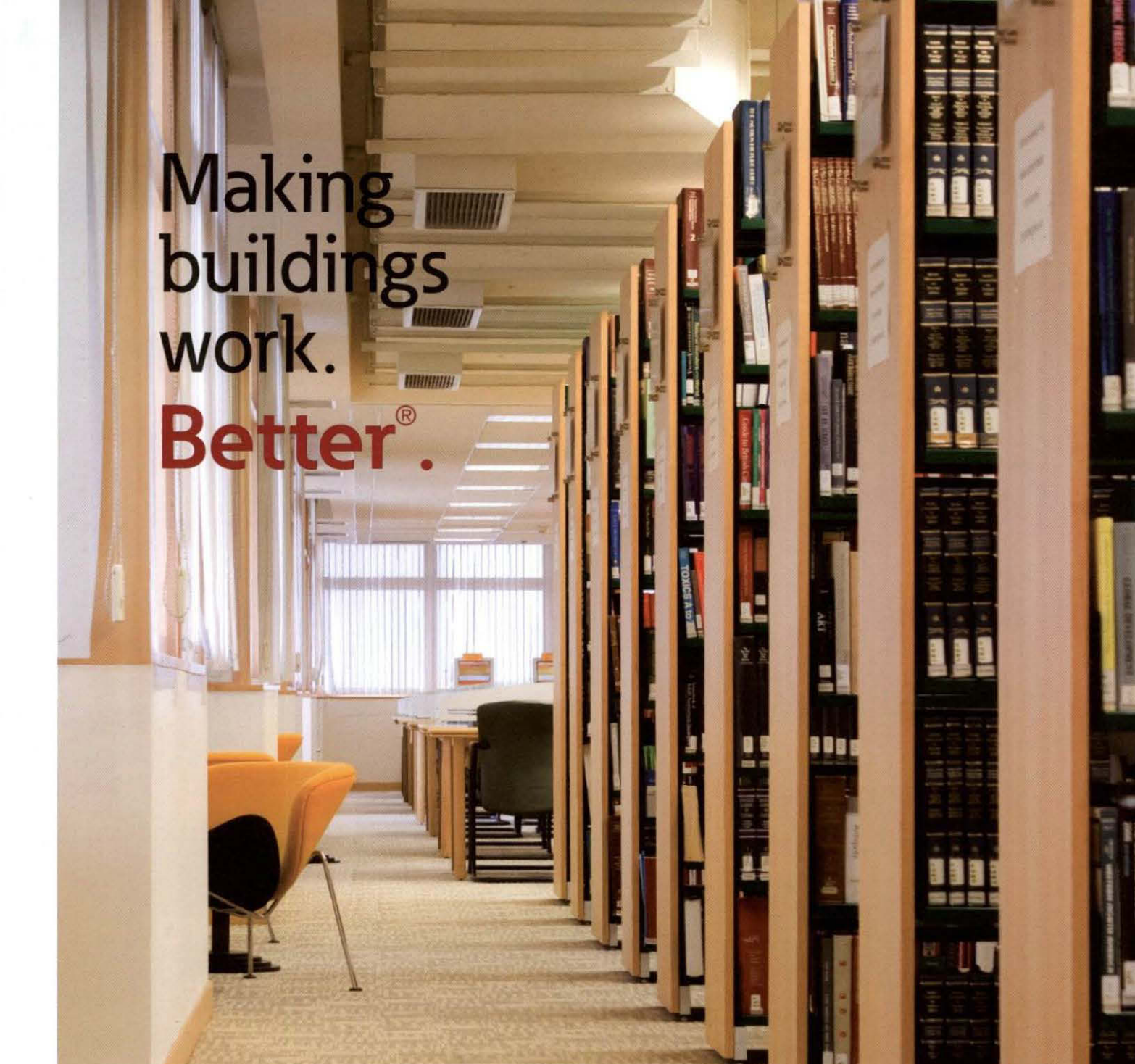
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