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APPA Announces Conference Keynote Speakers

Registration is now open for the APPA 2019 Conference & Exhibition, scheduled for July 15-17 in Denver, Colorado. A full slate of concurrent educational sessions can now be viewed on the conference website at *http://annualmeeting.appa.org/*.

APPA will be publishing and distributing a print version of the July/August 2019 issue of *Facilities Manager* for all attendees. In addition, we will distribute a print version of the 2019 Thought Leaders report only to APPA 2019 conference attendees. The topic this year is innovation and entrepreneurship.

A central part of every annual conference are the three general sessions highlighting inspirational, interesting, and thought-provoking keynote presentations. We are pleased to introduce you to the keynoters for the 2019 conference and urge you to register soon to join us this July in Denver. The descriptions are adapted from the conference website.

MONDAY, JULY 15

Erik Aude, Actor

Perseverance & Survival—The Human Spirit

In 2001, Erik was sent to death row in Pakistan for a crime he didn't commit. For a three-year period he endured one of the most dangerous prisons in the world, where he was forced to fight every day to survive. His release in 2004 allowed Erik to pick up his life where he left off as an American actor, stunt coordinator, and professional poker player.

TUESDAY, JULY 16

David Mead, Author and Trainer

Find Your Why

In 2009, shortly after beginning his MBA studies, he met, and was inspired by, Simon Sinek and his concept of the Golden Circle and was invited to join Simon's team. In 2012 he began speaking and facilitating workshops to help shift people's perceptions about leadership and culture. David has co-authored with Simon, *Find Your Why*, a step-by-step, practical guide on how to discover the Why for any individual, team, or organization.

WEDNESDAY, JULY 17

Scott Christopher, Author and Actor

The Levity Effect: Why It Pays to Lighten Up

Since 1995, Scott has circled the globe entertaining and motivating thousands of audiences. His unforgettable messages and off-the-cuff humor illustrate firsthand how levity, humor, and becoming a "people person" enrich lives at work and at home. Scott is also a television host, emcee, and actor (SAG), appearing on network television series *Modern Family, Criminal Minds, Granite Flats,* and others. Scott has a master's in HR management from the University of Connecticut and received his undergraduate degree at Brigham Young University.

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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. Founded in 1914, 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 more than 20,000 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*.

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facilities digest

By Anita Dosik

Candidates Announced for APPA Office—2019-2020

The APPA Board of Directors is pleased to announce the selected slate of officers for the 2019-2020 elections. The Nominating Committee was led by APPA Immediate Past President Chris Kopach.

President-Elect

- **Bob Andrews**, *California State University East Bay*
- **Jim Jackson**, *University of Nebraska Lincoln*

Voting opens to primary/institutional representatives on Tuesday, March 19 at 8:00 a.m. Eastern time. Those eligible to vote will be able to do so online or via paper ballot. The online ballot will include a link to a video statement from each candidate. The ballots close at midnight Eastern time on Tuesday, April 23, 2019.

Please note that the primary/institutional representative will have the option of having an associate member to vote on their behalf via proxy (only one vote will be accepted from each institution).

To learn more about the candidates and to vote, go to *www.appa.org/vote*. If you have any questions, contact Anita Dosik at *anita@appa.org* or 703-542-3837.

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Denver, Colorado
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APPA Dues are Due

APPA has sent membership renewal invoices to all APPA members for the fiscal year April 1, 2019–March 31, 2020.

Please pay your dues promptly to keep receiving APPA's many membership benefits. For more information, contact member services at *membership@appa.org*.

Upcoming Chapter Conferences—2019

APPA maintains a calendar of events taking place in your region or chapter, as well as other events focused on educational facilities. You can view the calendar at *http://www.appa.org/calendar/index.cfm*, and also add events of interest to your APPA colleagues.

Upcoming Chapter Conferences—2019

Mar 31-Apr 2: **Texas** (*San Antonio*)
Apr 16-17: **Iowa** (*Ames*)
May 8-10: **North Carolina** (*Greenville*)
May 13-14: **Tennessee** (*Memphis*)
May 25-29: **Georgia** (*Jekyll Island*)
May 28-31: **Ontario** (*Toronto*)

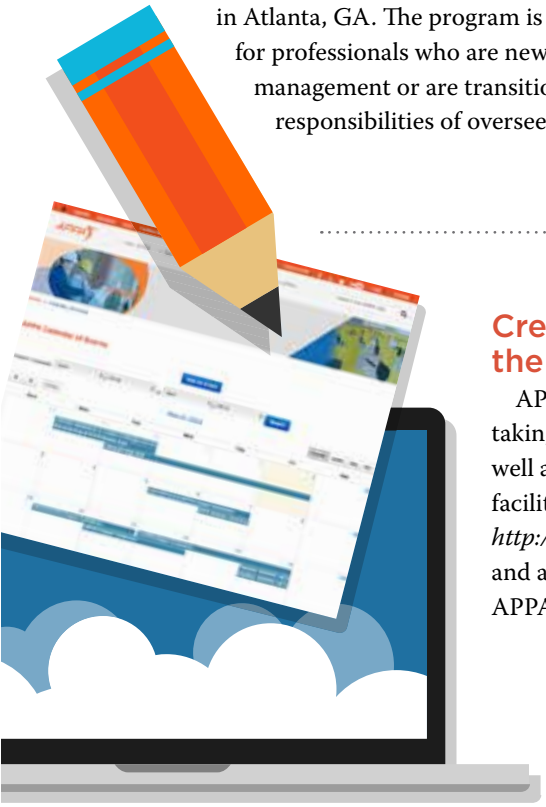
This list is actively being compiled; for the latest information visit *https://www.appa.org/regions/chapters.cfm*.

To submit your chapter information, please email* membership@app.org *with your chapter contact, email, and URL if available.

Essentials of Facilities Management Training Seminar

Essentials of Facilities Management Training Seminar is a foundational development program for college union professionals and other facility administrators. This event, co-presented by **ACUI: Association of College Unions International** and **APPA**, will take place June 17-21, 2019 at Emory University in Atlanta, GA. The program is designed for professionals who are new to facility management or are transitioning into responsibilities of overseeing facilities.

Association of College Unions International



Create Your Own Event on the APPA Online Calendar

APPA maintains a calendar of events taking place in your region or chapter, as well as other events focused on educational facilities. You can view the calendar at *http://www.appa.org/calendar/index.cfm*, and also add events of interest to your APPA colleagues.

CALENDAR OF EVENTS

APPA Events

Apr 11, 2019
Eclipse VOLTTRON Platform Enables Successful Integration of Photovoltaic and Battery Energy Storage Systems on University Campus/University of Toledo, *Webinar*

May 9, 2019
OSHA's Top 10: An Analysis of the Most Cited Workplace Safety Violations in 2018, *Webinar*

Jun 6, 2019
Total Cost of Ownership and APPA TCO 1000, an ANSI Recognized Standard, *Webinar*

Jun 17-21, 2019
APPA/ACUI Essentials of Facilities Management Training Seminar, *Emory University, Atlanta, GA*

Jul 15-17, 2019
APPA 2019 Annual Meeting & Exposition, *Denver, CO*

Sep 8-12, 2019
APPA U—Institute for Facilities Management, *Nashville, TN*

Sep 10-12, 2019
APPA U—Leadership Academy, *Nashville, TN*

Regional Events

Sep 16-18, 2019
RMA 2019 Regional Meeting
Banff, Alberta, Canada

Sep 29-Oct 2, 2019
ERAPPA 2019 Regional Meeting
Erie, PA

Sep 29-Oct 1, 2019
PCAPPA 2019 Regional Meeting
Las Vegas, NV

Sep 30-Oct 3, 2019
CAPPA 2019 Regional Meeting
Winnipeg, Manitoba, Canada

Oct 6-9, 2019
SRAPPA 2019 Regional Meeting
Hosted by Northern Kentucky University, Covington, KY

Oct 13-17, 2019
MAPPA 2019 Regional Meeting
Mall of America, MN

For more information or to submit your organization's event, visit *www.appa.org/calendar.*

Sustainability in Campus Housing: The Overlooked Reality of Sleeping on Eventual Trash

By Mike Padrnos and Christine Hansen

Often times when we think about sustainability on college campuses, we immediately think of recycling bins in dorm rooms, reusable water bottles, and auto-lighting. We may refuse to use items as small as a plastic straw or may be intent on printing our reports on 100 percent recycled paper.

All of that positively contributes to sustainability on college campuses and helps lessen our carbon footprint. However, it can be easy to overlook this logic when we apply it to bigger items that we use every day… *or night*. More often than not, residence hall and dormitory mattresses are disregarded in terms of the amount of eventual landfill trash students are sleeping on. No, we're not talking about poor quality dorm mattresses—that's a different story. We are talking about what happens to residence hall mattresses when they've run their course.

MATTRESSES AND LANDFILLS

Roughly 20 million mattresses are thrown into landfills every year. That's the equivalent of 13.5 Empire State Buildings!

Depending on their construction, mattresses can sit in landfills for over 200 years. Because they don't decompose or breakdown like other waste products, their shelf lives outlast the human lifespan, leaking chemicals into the ground and potentially causing pollution and water contamination. Mattresses can destroy animal habitats and ruin landfill equipment and take up valuable space.

What are the challenges associated with mattress recycling? Even "green campuses"—those leading the environmental charge, committed to sustainability initiatives—are finding it difficult to recycle their mattresses. There are few mattress recyclers available to them and the extra costs incurred (transit and recycling fees) can be budget breaking.

Repurposing, or the donation of used mattresses, is slowing as well due to the increased awareness of bed bugs and other sanitation concerns. With sustainability efforts on the rise and tens of thousands of mattresses being replaced from campus housing each year, it is important to find a reasonable recycling solution.

ENVIRONMENTALLY FRIENDLY SOLUTIONS

Fortunately, a few mattress manufacturers have recognized this growing environmental issue and are bringing environmentally friendly mattress solutions to the collegiate marketplace. There are new mattress constructions available today that are built using recycled or recylable materials—constructions void of any harsh chemicals, foam or steel components.

With college and university sustainability officials increasing their focus on campus waste diversion rates, dorm mattress recycling may be a new area of study that may provide an alternative avenue to advance collegiate green initiatives.

Mike Padrnos is business development manager at Lippert Interiors/somnum® in Elkhart, IN. He can be reached at *mpadrnos@lci1.com*. Christine Hansen is a college intern at Lippert Interiors/somnum® mattress and just graduated from Indiana University South Bend. This is their first article for *Facilities Manager*.

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From the Military to Educational Facilities Management—A Smooth Transition

By Andrew Feick

I have been a proud and active APPA member since 2005, but it's important for me to discuss the value that professional organization membership held for me even before then. I am among the many facilities managers who were in the U.S. military before transitioning to higher education facilities management (FM). It was my good fortune that the U.S. military has a strong mentorship and networking ethic; that is why I was well supported when I decided to leave military service in 1995. My Society of American Military Engineers (SAME) colleagues connected me with several former military engineers who could help me with military transition and employment. It was one of these contacts who gave me an entrance into higher education FM.

In truth, I had no concept of FM as a career at that time, but when I was told, "We are looking for people with your skills to work on college campuses," I was hooked. I had always had a passion for higher education and academic environments, and so it was fortuitous that a former military employer understood how my skills could transfer to higher education FM. Hence, a 23-year (and counting) career was born.

THE VALUE OF PARTICIPATION AND LEADERSHIP

Fast forward to 2005, when I decided to leave contract FM and move to working directly for a college. I was incredibly fortunate to replace the retiring Fred Klee, a former APPA member and ERAPPA President, as facilities director at Ursinus College. Klee strongly impressed on me the value of APPA International, and of participation and leadership within the local APPA chapter and region. Though he was retiring, he introduced me to the institutional chapter members, who embraced me and helped me understand my own institution's place within higher education in the Greater Philadelphia area and helped me navigate these new waters. I have happily returned this favor many times over to new facilities managers in our local APPA chapter.

One of the many rewarding aspects of this profession is that it allows me to help fellow FM professionals of all ages to advance their careers; it is our professional network that offers the most assistance in this area. Just last week I helped connect a former student worker who is a graduating senior from Temple University's FM program with an area institution that I knew was expanding and needing additional FM support. I hope his interview was fruitful! I have also enjoyed informing colleagues about pending retirements at other institutions that will create career opportunities for them—and there are many retirements these days! My own recent transition is a trans-profession networking story.

MOVING FORWARD

I had a lot of hiring to do while at Temple University, and I worked closely with Temple's facilities human resources recruiter. She was an excellent recruiter, and I was sorry when she left Temple to take a position at Swarthmore College. I asked her to let me know if any FM leadership positions would become available there. Swarthmore College is among the finest private liberal arts colleges in the country, and I had known their FM leadership for more than a decade from involvement in our local chapter, Delaware Valley APPA (DVAPPA).

I was excited when she called me two years later to let me know that the facilities VP was retiring and that Swarthmore College was looking to hire an associate VP (AVP) to support the facilities operations and capital program. It was a tremendous advantage that I already had a positive relationship with several of Swarthmore College's facilities department directors through DVAPPA events over the years.

I am genuinely grateful to have been hired by such a fine institution, and it is evident that the positive references from my APPA colleagues and my local DVAPPA relationships helped. The APPA network is the first place I turn when we are looking for top talent to augment our own team.

The rich professional networking opportunities that APPA offers—especially within the APPA network— are what I have chosen to focus on here. They have helped to advance my own FM career, and can certainly help other FM professionals as well. But in addition to those opportunities, APPA membership offers a vast array of professional and personal benefits, from professional development to collegial advice available on the APPA member listserv. Try APPA and find out for yourself!

Andrew Feick is AVP facilities management at Swarthmore College in Swarthmore, PA. He can be reached at *afeick1@swarthmore.edu.* This is his first article for *Facilities Manager*.

Attend our **Military Transition Workshop for Careers in Educational Facilities** at APPA's Annual Conference in Denver, Colorado! Connect with former military officers and enlisted personnel who transition into successful military careers in educational facilities. Admission is free to active duty military in uniform. **Tuesday, July 16, 1:15pm–4:45pm.**

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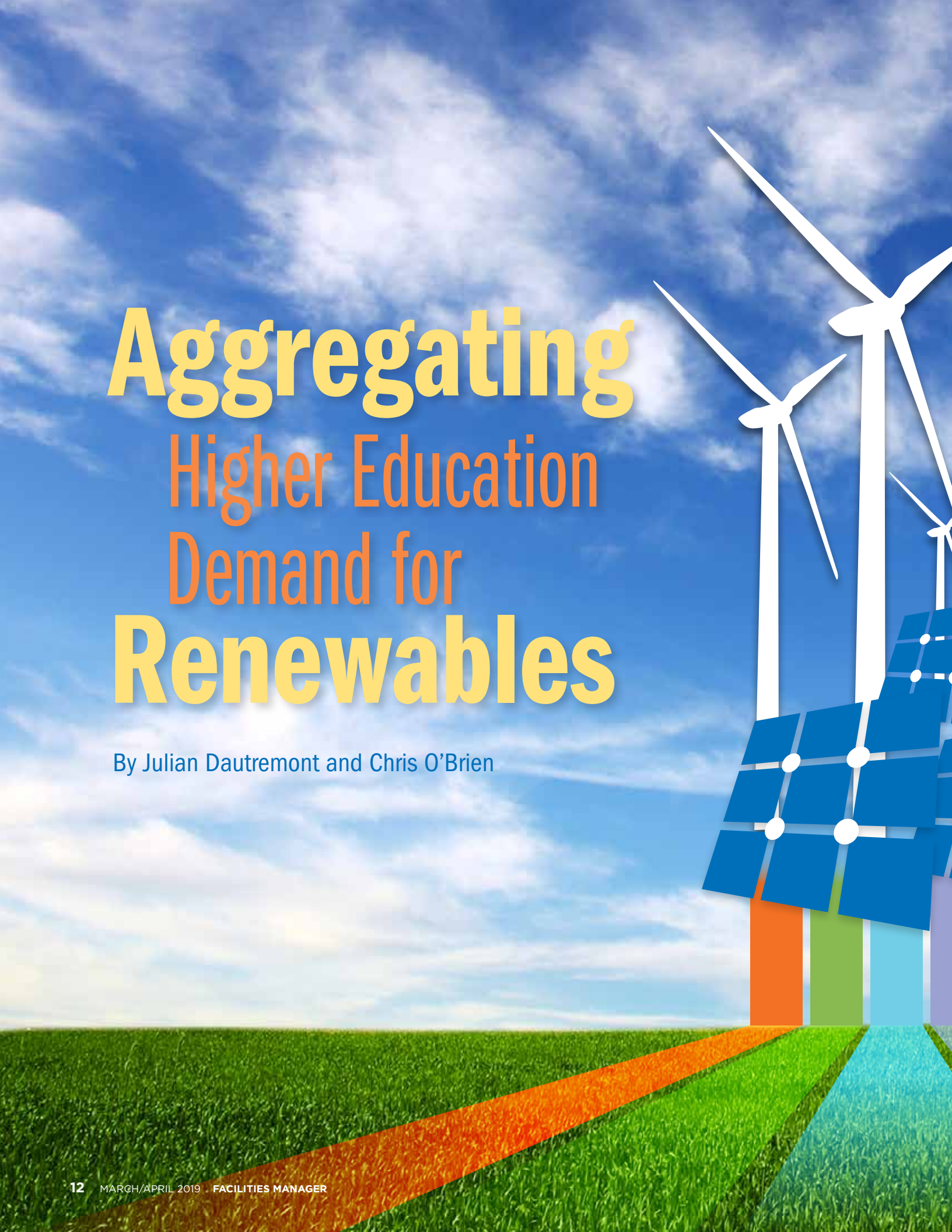

Aggregating Higher Education Demand for Renewables

By Julian Dautremont and Chris O'Brien

Cohorts of colleges and universities are aggregating energy loads to achieve economies of scale when sourcing renewable energy. This article highlights the benefits of this aggregated approach by examining several completed group purchases as well as some in progress, such as a 100,000-MWh effort in Pennsylvania. It also describes best practices for pursuing group renewable energy aggregations structured as power purchase agreements (PPAs).

INTRODUCTION

Campuses are increasingly looking to renewable energy as the most financially attractive strategy for achieving dramatic reductions in greenhouse gas (GHG) emissions while reducing long-term energy costs and minimizing energy price risk.

A number of campuses have already taken steps to source renewable energy. In fact, as reported in *Assessing the Higher Education Sector's Use of Renewable Energy*, more than 240 are already using some amount of renewable energy. However, according to *The State of Sustainability in Higher Education 2016: The Life Cycle of Higher Education Facilities*, average annual campus GHG reductions have not been commensurate with many of the carbon-neutrality target dates compiled in the report. Unless campuses take more dramatic actions, they may be at risk of missing GHG reduction goals.

Since 2009, there has been steady growth in renewable energy adoption by institutions of higher education. Many schools purchase "unbundled" renewable energy certificates (RECs). As the costs of solar and wind energy have dropped, many campuses are now sourcing renewable energy via power purchase agreements (PPAs) from onsite solar arrays as well as from offsite, utility-scale solar and wind farms.

Onsite solar is an attractive strategy because it can be highly visible to campus stakeholders and because it is "behind-the-meter," which means it can displace more of the delivered cost of electricity. However, it is constrained by the size of the sites on a campus available to host arrays, therefore typically only providing a small portion of campus electricity usage. Given the approaching carbon neutrality target dates, onsite solar is unlikely to provide the scale needed by many campuses to reach their GHG targets on time.

Offsite wind and solar projects are much larger and are therefore capable of providing up to 100 percent of a campus's electricity usage—achieving dramatically larger GHG reductions and far more significant financial benefits.

Both options can be conducive to a consortium-style approach in which two or more entities aggregate their efforts in order to capture economies of scale. Higher education is particularly well suited to aggregation strategies, as evidenced by the growing number of cohorts emerging to achieve scale through renewable energy buyer groups.

BENEFITS OF AGGREGATION: CREATING AN ENERGY COHORT

There are several benefits to aggregating campus energy load for the renewable energy market, including:

Reducing soft costs through peer-learning cohorts

Most campuses have yet to adopt a comprehensive renewable energy strategy or, at least, have yet to execute a large onsite or offsite renewable energy PPA. One of the main benefits of participating in a renewable energy consortium is to climb the learning curve with a group of peers—or, perhaps, lead your peers on that journey. *Soft costs can account for as much as two-thirds of the cost of an institutional renewable energy deal.* Undertaking the learning process as a group can help cut those costs for developers by reducing the effort needed to acquire customers, which gets passed along to the institution in the form of lower PPA prices.

Gaining momentum

Renewable energy developers are attracted to colleges and universities because of their status as "forever" institutions. Stability and longevity tend to go hand-in-hand with strong credit ratings, which helps keep the cost of capital down for developers. But institutions that expect to be around forever (or close to it) also tend to take slow, methodical steps into unfamiliar territory. Thus, it can be challenging to gain traction on large-scale renewable energy efforts. The shared accountability that comes from working with peers can be a good way of keeping things moving forward.

Achieving scale

The average wind-project size in the United States is now over 200 MW. Utility-scale solar projects are smaller, on average, but many are still too large for one campus. Some projects will accommodate smaller PPA contract sizes, but many will not. This means that many (probably the vast majority) of campuses will be restricted in the number of projects willing to seek their business, simply because there is a mismatch between the amount of electricity used by the campus and the amount produced by the project. Going to the market as a group can attract more competition and therefore more attractive bids.

Higher education is especially suited to aggregation, for several reasons:

1. Size matching

A rooftop solar array can sometimes produce all the power a single home needs in a year, and utilities can purchase all the output from a single large wind or solar farm. But most colleges occupy a midsize energy-usage segment in the market, falling somewhere between residential and utility-scale. This means that solar arrays located on campuses are unlikely to produce as much electricity as a campus uses—often just a small percentage of the total annual usage. But wind and solar projects that produce hundreds of thousands of megawatt hours of electricity per year are much too big for most campuses. Thus, combining electricity loads from two or more campuses helps achieve a scale that is more attractive to renewable energy project developers.

2. History of collaboration

While each college and university has its own independent financial responsibilities that require it to compete in the marketplace for students, faculty, and staff, higher education institutions also have a long history of collaborating with institutions that might otherwise be viewed as competitors.

3. Town–gown relations

Some local governments are adopting climate plans or renewable energy targets. Colleges and universities often represent a large constituency to local governments, which can provide opportunities as well as responsibilities. It is possible that an aggregated renewable energy procurement can align with, and contribute to, a local or state government renewable energy goal, providing a positive opportunity for town–gown relationships.

CHALLENGES AND SOLUTIONS: LOCKING ARMS OR HOLDING HANDS?

The benefits of a renewable energy aggregation strategy must be weighed against the challenges of such an approach. Inherently, joining a group can raise questions regarding the independence of each member. This section highlights two sources of tension that institutions may face in aggregating their demand with others and suggests an approach to manage these tensions that can be summarized as "holding hands, not locking arms."

Tension: Coordinating Schedules

Solution: To the extent feasible, identify key decision-making points in the process and schedule them in advance. Individual participants may be better able to keep their internal processes moving forward if there is a clear group deadline. Consider who will need to

sign off on each important milestone and schedule time with them as far in advance as possible. It is easier to cancel a meeting than to get one scheduled with a senior decision-maker at the last minute.

Tension: Agreeing on Project Criteria

Solution: Discuss project criteria early in the process. Criteria can affect financial benefits, risks, and sustainability impacts. Think about criteria in terms of requirements versus "nice-to-haves." Establish clarity about the minimum requirements for success, as compared to what might be a shoot-for-the-stars scenario. Identify any "deal-breaker" criteria that are unlikely to change regardless of other mitigating factors. Otherwise, taking a "consider-all-options" approach until a more complete picture emerges may be helpful.

CRITERIA FOR CONSIDERATION:

- *Financial benefits*—will the project economics mitigate risk associated with energy-price volatility, improve budget certainty, and reduce costs?
- *Location*—are you looking for a solution that is on campus (i.e., "behind the meter"), or will you consider solutions that are nearby, in-state, within your regional market, or beyond your regional market?
- *Environmental attributes*—will you require RECs from the project, or are national RECs sufficient?
- *Academic integration*—does the solution need to include any teaching or research components?
- *Contract term*—how long do you want to contract for renewables?

Different participants may have different requirements. For example, some projects may allow one buyer, or "offtaker" as they are called, to retain RECs from the project, while another offtaker allows the project owner to retain the project RECs. The number of years in the contract term may also be flexible, with one participant contracting for 12 years and another for 15 years, for example.

Keep in mind that one of the benefits of aggregation is minimizing soft costs by working as a group. Thus, the more the

group agrees on similar requirements, the more efficient the process is likely to be. But, in the end, if participants are holding hands rather than locking arms, then each will have the flexibility to make independent decisions about many of the criteria.

AGGREGATE EXAMPLES

Capital Partners Solar Project, 2016

American University (AU) and George Washington University (GWU) in the District of Columbia, banded together to seek renewable sources for at least 50 percent of the electricity used by each campus. The GWU Hospital (a separate buying entity from the university itself) also joined the effort. The group worked with CustomerFirst Renewables (CFR) to pioneer a demand-side aggregation procurement process to competitively solicit and sign PPAs from a utility-scale renewable energy project. In the end, the three members (AU, GWU, and the GWU Hospital) sourced 53 MW of solar from one developer under similar terms. The project has been operational since early 2016 and has provided an opportunity to optimize GW's energy procurement strategy, leading to strong cost savings.

Massachusetts Institute of Technology, 2017

The Massachusetts Institute of Technology (MIT), Boston Medical Center (BMC), and Post Office Square procured and contracted electricity from a 60-MW solar project. By aggregating the three organizations' demand, each could benefit from the economies of scale inherent in contracting for a larger renewable project, while working as a group ensured that any issues arising during the engagement were problem-solved together, providing an additional reassurance mechanism for a new and unfamiliar business decision and sustaining momentum throughout the engagement. The result was the largest demand-side aggregation across multiple industries in the United States at that time. The project is currently producing energy in line with initial estimates and providing strong environmental and risk mitigation benefits to MIT, BMC, and Post Office Square.

Emerging Aggregation, 2019

A leading university has organized a group of three (possibly four at the time of publication) colleges and universities in Pennsylvania to seek at least 100,000 MWh of electricity from renewable sources. The cohort is working to align their stakeholders around common goals and project criteria, and expects to have gone to the market seeking renewable energy solutions by the time this article is in print. This group has already helped inspire additional emerging aggregations in Pennsylvania.

CONCLUSIONS

According to data reported in *Assessing the Higher Education Sector's Use of Renewable Energy*, the higher education sector is adopting renewable energy at a steady growth rate. Indeed, hundreds of campuses are now buying renewable energy, but most are either buying "unbundled RECs," which incur an added cost, or they are sourcing onsite solar, which is a step in the right direction but lacks the scale needed to make significant financial and environmental impacts.

In short, the renewable energy adoption rate in higher education may be too slow to meet the sector's voluntary GHG reduction goals. Ramping up renewable energy sourcing through large-scale, offsite PPAs may be among the most financially viable ways to meet the goals on time. But large, offsite deals are complex and can be time-consuming.

In this light, renewable energy buying consortia that aggregate campus load and create "learning and doing" cohorts may be the pivotal strategy that enables hundreds of colleges and universities to meet their climate goals under financially attractive conditions.

Julian Dautremont is director of programs at the Association for the Advancement of Sustainability in Higher Education (AASHE) and can be reached at *julian@aashe.org*. Chris O'Brien is director, business development, for CustomerFirst Renewables and can be reached at *cobrien@customerfirstrenewables.com*. This article, their first for *Facilities Manager*, was adapted and updated from the 2018 AASHE document, *Aggregating Higher Education Demand for Renewables: A Primer*.

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Ingersoll Rand

Excellence in Sustainability a Priority at UCalgary

By Clara Deacon

At the University of Calgary (UCalgary), sustainability is a core value. An institution comprising 30,000 students, 1,800 academic staff, and 3,200 nonacademic staff, UCalgary has a commitment to sustainability that is inherent in its longstanding and unwavering commitment to excellence and leadership.

In 2016, UCalgary launched the Institutional Sustainability Strategy (ISS) and three supporting frameworks: academics, operations and administration, and engagement. The ISS provides the direction and impetus for action for the university to advance sustainability, and is in support of UCalgary's *Eyes High* strategic vision and its goal to become one of Canada's top five research institutions. Excellence in sustainability is also embedded in the priorities outlined in UCalgary's Academic and Research Plans.

MacKimmie Tower at the University of Calgary

Photo credit: University of Calgary

CLIMATE ACTION

UCalgary is one of the universities leading the way among Canadian postsecondary institutions in reducing its greenhouse gas (GHG) emission footprint. Guided by the ISS, UCalgary is striving to attain net-carbon neutrality, to be one of the most energy-efficient campuses in Canada, and to be a leader in healthy, high-performance buildings. UCalgary's Climate Action Plan (CAP) provides the roadmap for reaching these objectives.

As a signatory to the 2015 Paris Agreement, Canada is committed to reducing its GHGs 30 percent by 2030, to help reduce global carbon emissions. In 2018, GHG emissions per UCalgary campus user were 36 percent lower than in 2008, with a 30 percent absolute reduction, helping the institution reach Canada's 2030 target a decade ahead of time.

UCalgary has reduced GHG emissions by approximately 69,000 tons annually, by implementing initiatives and programs to reduce the GHG intensity of energy supply and to make new and existing buildings more energy efficient. To put that in perspective, that is approximately equivalent to the energy generated by 17 wind turbines in one year, and positions UCalgary among the leading postsecondary institutions in Canada for GHG emission reductions. UCalgary's recently released 2019 CAP has assigned renewed targets and strategies, setting the trajectory for a 50 percent GHG reduction from 2008 by 2030, and carbon neutrality by 2050.

INNOVATION IN BUILDINGS

"We are acting on our goal to be a Canadian leader in healthy, high-performance green buildings," says Joanne Perdue, associate vice-president (sustainability), University of Calgary. "With 16 certified and registered LEED (Leadership in Energy and Environmental Design) projects, including two projects certified LEED Platinum, and two net-zero carbon buildings under development, we are well on our way."

Among current projects underway, the redeveloped MacKimmie Tower and the new link and block are designed as high-performance, net-zero carbon buildings. The MacKimmie complex, which comprises more than 40,000 sq. m. of renewed spaced in the heart of the main campus, is also one of 16 projects selected to participate under the Canada Green Building Council's new Zero Carbon Building Standard.

To achieve net-zero carbon operations, the redeveloped MacKimmie Tower and new link and block will incorporate an advanced double-wall facade, which creates an energy-saving climatic buffer that also optimizes comfort for building occupants. The complex will generate more than 500 MWh of renewable energy annually through building-integrated photovoltaic systems; this energy generation, combined with energy-efficient design, is predicted to reduce the building's energy consumption by more than 90 percent.

This project is a multiyear, multiphase project, implemented to address deferred maintenance and modernization, enhance pedagogical and administrative environments, and accommodate growth. Over 1,300 people will be moving into the new MacKimmie Tower when it opens in fall 2019. The project is funded thanks to support from the Government of Alberta. The new Mathison Hall building, which is currently under design, also seeks to achieve net-zero carbon operations.

Targeting existing buildings on campus, UCalgary's Utility Reduction Program (URPr) is a key initiative in reducing the impact of building operations on the environment, institutional GHG emissions, and operating costs across the university. On completion, this multiyear program intends to reduce institutional GHG emissions by 23,000 metric tons annually while generating an expected utility cost avoidance of over $3 million per year. URPr builds on the success of the previous multiyear Energy Performance Initiative.

Currently in year four, URPr involves discrete annual projects in various buildings across campus, and encompasses mechanical and building control upgrades, retrocommissioning, lighting retrofits to replace fluorescent tubes with LED lights, the installation of energy recovery systems, and other upgrades that allow older structures to meet current needs by rethinking how UCalgary's buildings operate.

CAMPUS CULTURE AND EXPERIENTIAL LEARNING

"UCalgary is committed to enriching our engagement by helping to make sustainability part of campus life, and by building leadership capacity and partnering with faculties and units," says Perdue.

The university's Sustainable Events program as well as the recently launched Sustainable Offices program help UCalgary community members act to make workplaces and events more inclusive, environmentally conscious, and socially responsible. These programs aim to build and support a sustainability culture on campus by offering UCalgary-specific best practices as well as simple tools, resources, and workshops to support sustainable decision-making.

"We also differentiate ourselves and our sustainability practices through our ongoing pledge to provide opportunities for students to thrive in programs rich with research, formal education, and applied, hands-on experience. This too emerges from our institutional *Eyes High* vision and our Academic Plan," says Perdue.

"We are advancing sustainability education and research by integrating sustainability across disciplines to respond to and partner with our community. Our research aims to solve social, economic, and environmental sustainability challenges locally and globally. At UCalgary, we offer more than 400 sustainability-related courses, with more than 30 percent of our faculty working in sustainability-related research areas."

UCalgary's Community Garden

Photo credit: University of Calgary

The Campus as a Learning Lab (CLL) program brings together students, faculty, and staff to work on projects that make UCalgary more sustainable and bring the ISS to life. In 2018, more than 80 undergraduate and graduate students were involved in more than 25 CLL projects.

One example of a CLL project is the Campus Community Garden, which provides a space for growing pesticide-free food and connecting on projects that support the development of sustainable food systems, healthy eating, and an understanding of food security/insecurity.

Additionally, this year, UCalgary saw the first cohort of graduates from its new undergraduate certificate program in sustainability studies. This program includes partnerships with the City of Calgary and UCalgary operational units, which provide hands-on, sustainability-related research opportunities. Students in the program have the unique opportunity to work with stakeholders and communities on real-world challenges.

UCalgary is a place where students become leaders through experiential learning, grounded in sustainability. The university has over 50 sustainability-related clubs on campus, several of which work together through the Sustainability Club Alliance. This past year, several clubs came together to align their efforts with the United Nations Sustainable Development Goals (SDGs). Student sustainability leaders are supported through a variety of programs offered out of UCalgary's Sustainability Resource Centre.

A MORE SUSTAINABLE FUTURE

UCalgary's efforts in sustainability are continuous, and they adapt based on the growing needs of the community. The university has been recognized for ongoing efforts in sustainability, having received the Global Compact Network Canada's Sustainability Development Goals Award in 2017, and was named Canada's Greenest Campus by Corporate Knights that same year. UCalgary has also maintained a STARS Gold Rating since 2013 for overall sustainability performance from the Association for the Advancement of Sustainability in Higher Education (AASHE), and it has been a certified Fair Trade Campus for the past three years.

"At UCalgary, we are tackling some of the global sustainability challenges facing universities, governments, and businesses in Canada and around the world," says Perdue. "These are difficult challenges and there are no quick solutions, but we recognize the importance of this work. We strive to make sustainability a part of campus life for students, faculty, and staff, building leadership capacity, knowledge, and partnerships across our faculties and units, and with local and global communities."

Clara Deacon is the manager, institutional communications, at the University of Calgary, Calgary, Alberta, Canada; she can be reached at *cclorey@ucalgary.ca*. This is her first article for *Facilities Manager.*

Optimizing Sustainability Throughout a Building's Life Cycle

By Mary Acciani, P.E., CEM

Newly constructed buildings are designed to be extremely energy efficient to meet current building and energy codes, but meeting these code requirements does not optimize the building's energy sustainability. Sustainability goals and especially energy efficiencies designed into a project can be unrealized due to changes during construction, buildings not operated as designed, occupants' behavior countering sustainability goals, and equipment/systems aging. The purpose of this article is to provide facility managers with tools to help optimize the energy efficiency of buildings over each phase of the entire life cycle: **predesign**, **design**, **construction**, **initial occupancy,** and **post-occupancy**.

OPTIMIZING SUSTAINABILITY IN EACH PHASE OF A BUILDING'S LIFE CYCLE

Predesign

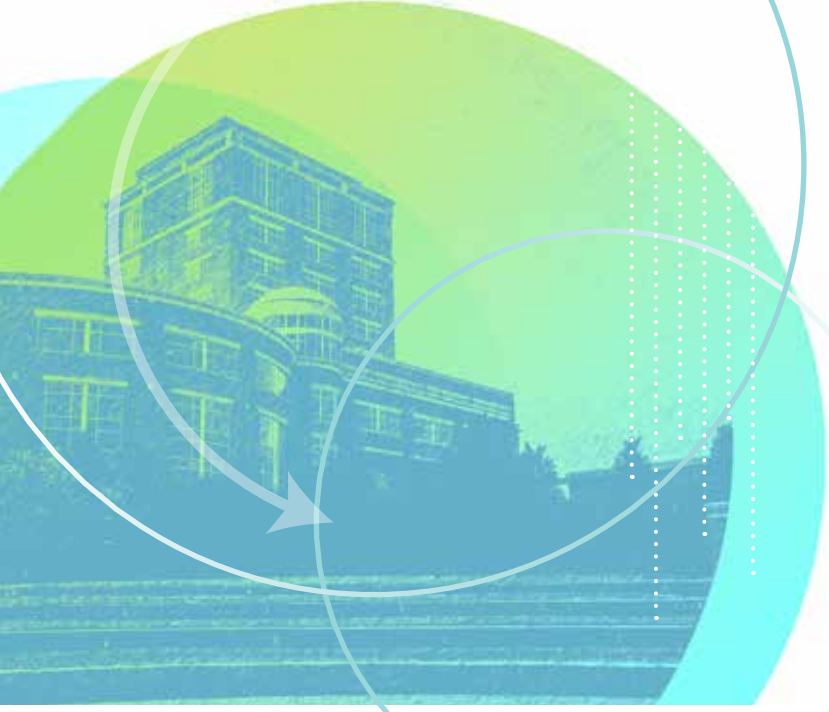
In higher education, the **predesign** phase usually starts with a need identified in an academic or strategic master plan. If the institution has one, a sustainability master plan will provide guidance on sustainability goals the building project should target. During this phase, a design team is hired comprising architects; civil, geotechnical, structural, HVAC, plumbing, fire protection, and electrical engineers; IT/AV/security specialists; and commissioning agents and energy modeling specialists. An institution's goal of making a new project sustainable can be unrealized when project execution fails to focus on what's necessary to assure that the goal is met. Below are recommendations for steps to take during the predesign phase to achieve optimal sustainability.

Create a sustainability master plan prior to beginning a new building project. If such a plan doesn't exist, having one can help guide the process toward optimization.

Set criteria for site selection. Often an institution's facility master plan will identify sites for future building construction.

Identify attributes of proposed sites to maximize sustainable options. Are sites near public transportation? Is the proposed site a greenfield site or a previously developed site? Is the proposed site large enough and oriented in such a way as to allow building orientation to be optimized? Can renewable energy, solar, or wind energy be located there or at another location on campus?

Set Goals. It's important to identify the desired level of sustainability for the project. Will it be Net Zero? Will it be LEED-certified (Leadership in Energy and Environmental Design) and if so, at what level? Will it be WELL-Building or Living-Building certified? What are the important attributes desired by the institution? If energy optimization is desired, it is critical to define measurable performance goals. Along with identifying desired certification levels, setting measurable performance goals at the beginning of the project makes it easier to evaluate options and make decisions. It's also important to identify the extent of the institution's commitment to fund sustainable options in the project. Many buildings end up less sustainable/energy efficient when the allocated budget is insufficient to cover the additional investment for desired sustainable options.



Select an experienced, sustainability-focused design team. Choose a team whose members have worked together successfully on several *sustainable* projects. Choose one in which the different disciplines respect one another and are all invested in collaboration and cooperation to achieve the optimum sustainability solution for the institution.

Design

In the **design** phase of a project, the architect and design team work with the client to develop a building that meets the institution's needs, fits into the campus, and can be built with the available budget. The design team creates a set of bidding and construction documents that define what the building looks like, how to build it and all of its systems, and what materials are to be used. During this phase, the sustainable aspects of the building project are identified and documented in the bidding and construction documents.

The design phase of a project starts optimistically, but over the course of the design process, the project can become less sustainable because of competing interests. The design phase is typically broken into subphases, which generally include programming/schematic (SD), design development (DD), 50 percent construction documents (CDs), and 100 percent CDs.

During the SD phase, the building is defined. How big is it? How many floors? What shape does it take? What does the building exterior look like? How much window area versus opaque wall area is there? What kind of HVAC systems will be used? Some suggestions for optimizing sustainability in the SD phase are offered below.

Verify concepts early on. During the early design phase, the sustainable potential of the project is identified by the design team. All projects involve a series of compromises, and it is no different with the sustainable aspects. For example, future occupants may desire more window area than what is optimal for maximizing daylighting while minimizing energy use. Or, the most energy-efficient HVAC system may cost more than the budget can handle. Early energy modeling should be used to vet the various options and provide insight and analysis to inform design choices and compromises, in order to verify that performance goals are being achieved. Life-cycle cost analysis of the various design choices should also be performed. It's essential that these choices and compromises be clearly identified and accepted by the whole team—the design team as well as the client team.

Investigate grants and rebates. It pays to investigate grants and rebates for energy-efficient systems and equipment early in the programming phase so they can be included in life-cycle cost analysis and decision making.

Choose enhanced and monitoring-based commissioning (EMBC) as well as envelope commissioning. Fundamental commissioning is necessary to make sure systems work as designed, but it is limited. A commissioning agent who is involved from the beginning of design can provide valuable insight and resources to optimize energy efficiency. In EMBC, the commissioning agent provides another set of experienced eyes reviewing the design prior to 50 percent CDs. The commissioning agent also assists with the requirements for measuring and metering, since providing adequate means to meter and monitor all energy consuming systems is one of the most valuable ways to enable optimization of the energy sustainability of a building.

When the design phase moves into the DD and CD subphases, changes can occur that reduce the overall sustainability of the project. During these subphases, the design team's focus shifts to documenting the ways and means of constructing the building—and sometimes energy efficiency takes a backseat. Strategies for continuing to optimize sustainability are given below.

Monitor goals, budgets, and value engineering. Projects typically review construction estimates after each subphase of design. Changes to the design are often made to keep the construction budget on track, and these changes can reduce project sustainability. For example, although there may be an acceptable payback for the initial investment in an energy-efficient HVAC system, sometimes there is simply not enough funding in the budget, and more expensive energy-efficient options are "value engineered" out of the project.

In order to verify that desired performance goals will be achieved, require an energy model after each subphase of design and for any value-engineering recommendations. Include a review of value-engineering options by the EMBC commissioning agent. Staying informed throughout the project allows the opportunity to make decisions to optimize sustainable aspects. Instead of value engineering to a cheaper HVAC system, an institution may prefer less-expensive finishes. Once a project reaches the final subphase of design, it

is often too late to reverse earlier value-engineering decisions without incurring additional design fees and extending the project schedule.

Review specifications. Make sure that the specifications are written to limit substitution of material and equipment, and that they require the contractor to provide thorough proof that substitutions are equal in every way, including all sustainable/energy-efficiency aspects.

All photos provided by AKF.

Assemble a team with experience working together and who share the desire to achieve optimum solutions.

Construction

After the construction documents are completed, the project is put out to bid and awarded to a contractor or construction manager. During the **construction** phase, there are many times when the sustainable aspects of the project become endangered. If the bids are overbudget, the project often undergoes value engineering, and sustainable aspects are at risk. Contractors often attempt to substitute less-sustainable items for those specified in the construction documents. During construction, installation of systems may not be as designed, which can negatively impact energy efficiency. Below are some strategies to help assure the finished building is as sustainable as it was designed.

Monitor budgets, substitution requests, and value engineering during bidding. Even if bids come in at or under budget, contractors sometimes suggest value-engineering alternates or request substitutions of specified items. To assure that the desired performance goals are achieved, it's important to stay involved and proactively require bidders to provide the energy impact of all suggested value-engineering/substitution recommendations. In the bid documents, require bidders to engage and pay for the design-team energy modeler to prepare new energy models reflective of any value-engineering/substitution suggestions.

Monitor contractor substitutions during construction. Substitution of specified equipment and material is common in construction projects. Contractors will claim they are unable to procure the specified equipment or that they cannot get it in time to meet the schedule. Sometimes they will submit substituted equipment with the hope that it will be approved as an equal. Rarely do they provide the owner with a reduction in the contract cost even if the substituted equipment is less expensive than what was specified. The design professionals should be fully engaged to review equipment submittals to assure that what is provided is equal in all respects to what was specified. With EMBC, the commissioning agent will review contractor submittals and provide yet another set of eyes.

Commission all systems. In addition to commissioning HVAC systems, domestic water heating systems, lighting, daylighting, and renewable energy systems provide for commissioning of electrical service and distribution as well as the building envelope. All of these contribute to the overall efficiency of the building, and commissioning can verify that they perform as designed.

Verify the contractor provides thorough training for facilities operations staff. The systems in a highly sustainable building are complicated and often on the leading edge of innovation. It is important for facilities staff to understand the systems, how they operate, and how to maintain them to keep them at peak efficiency. Contractors sometimes provide only rudimentary training. With EMBC, the commissioning agent develops a systems manual and verifies that the appropriate training is provided by the contractors. Videotaping the training sessions is a good way to keep the information available so as to refresh the knowledge of current staff or train new staff.

Initial Occupancy

Once the building is completed, commissioned, and has received a certificate of occupancy from the code official, the **initial occupancy** phase begins.

The initial occupancy period of a building can be challenging. Occupants are learning to adjust to new surroundings with features they may not have encountered before. Building operators are learning to work with complicated systems with which they may not have experience. Behaviors of both occupants and building operators can have negative consequences for the building's energy efficiency. Strategies to help optimize sustainability through this phase are listed below.

Educate occupants and building operators. Consider having the project design team conduct educational workshops to present the salient green features of the building. This will help occupants and operators understand the purpose behind the various systems' design features. Also, be sure to provide a building user's guide.

Engage occupants. Consider including a dashboard system to display monitored and tracked energy consumption in order to provide feedback to occupants.

Engage building operators with enhanced and monitoring-based commissioning. With EMBC, the commissioning agent conducts a review of building operations 10 months after substantial completion. The performance of energy- and water-consuming systems are monitored to determine energy and water use profiles that can help uncover conflicts between systems and out-of-sequence operation of system components.

Analysis of monitored systems is made at least quarterly in the first year of occupancy. An action plan is developed for identifying and correcting operational errors and deficiencies to achieve performance goals identified for the project. Training is provided to prevent errors, and a plan is developed for repairs needed to maintain performance.

Post-Occupancy

Once the first year of occupancy is through, optimization of the sustainable aspects of the building depends on the systems continuing to operate at the most efficient point as they age. Strategies to achieve **post-occupancy** optimization follow.

Millersville University's completed Lombardo Welcome Center.

Provide diligent maintenance. The importance of diligent maintenance can't be overstated. Performing preventive maintenance keeps equipment and systems operating at like-new efficiencies. Neglecting preventive maintenance to save time or money can create a domino effect, reducing system efficiencies. For example, neglecting timely changing of air-handling-unit filters results in dirty filters. These dirty filters obstruct airflow, with the result that fans must use more energy to overcome the obstruction. If the filters are extremely dirty, the fans may not be able to provide enough air, potentially resulting in poor temperature control and complaining occupants. This leads to issues addressed by the next strategy.

Operate the building according to the designed sequence of operations. Building operators sometimes make changes to how buildings are operated based on their own preferences or as a result of complaining occupants. Making changes to the operating sequences will negatively affect the building's energy efficiency. If occupants are suddenly complaining and the building is past the initial occupancy phase, it's likely due to systems not behaving as designed because they need maintenance or repair.

Conduct energy audits on aging buildings. After a building has been operating for 10 years or more, its systems are no longer state-of-the-art. Conducting energy audits on these buildings can identify worthwhile energy conservation measures (ECMs) with attractive payback periods. Implementing these ECMs will improve the energy sustainability of the building.

Retrocommission aging buildings. As buildings age, components and systems can develop problems and not perform optimally. Retrocommissioning can fine-tune existing systems to make them operate more efficiently.

CONCLUSION

As the saying goes, "The devil is in the details." And so it is with building sustainability. The strategies described above will help address those devilish details and optimize sustainability throughout a building's life cycle.

Mary Acciani is a professional engineer at AKF Group Engineers, Hamilton, NJ; she can be reached at *macciani@akfgroup.com*. This is her first article for *Facilities Manager* and was adapted from her presentation at the 2018 Conference of the Association for the Advancement of Sustainability in Higher Education.

APPA Student Internship Program

Enhancing Students' Futures by Expanding Their Facilities Network

By Gig Supanichrattana, Mac Gao, and Kristie Toohill

APPA is excited to partner with colleges and universities to make student internships even more purposeful and valuable. Many schools offer internships, but the APPA Student Internship Program will give undergraduate and graduate students more preparation and knowledge of educational facilities than a standard internship will. APPA's internship program has a solid structure that will help the host institutions and organizations deliver a successful internship and create a unique experience for the student interns.

The goal of the APPA Student Internship Program is to attract outstanding students from different schools to intern and get connected to APPA by applying for student membership at no cost. For those students who have no idea what educational facilities are about, APPA will be a welcome introduction. APPA believes it is necessary to build awareness more broadly and to present educational facilities as a viable, rewarding, and meaningful career path, by keeping students engaged and allowing them to be placed with the right people.

PILOTING THE APPA STUDENT INTERNSHIP PROGRAM

The APPA Student Internship pilot program was launched in summer 2018 as part of continuing efforts to engage the next generation of leaders in educational facilities and to expand their facilities network through connecting with APPA. Grand Valley State University and Illinois State University voluntarily participated in the pilot program this past summer and throughout the fall semester. During the pilot program, students had the opportunity to apply their knowledge to real-world situations and to develop the skills required for their future careers. Host institutions also benefited through new technologies and innovative ideas from the student interns.

WHAT MAKES THE APPA STUDENT INTERNSHIP PROGRAM DIFFERENT?

APPA has established strong foundations for the framework of the APPA Student Internship Program and provides many useful tools to help participants complete it successfully. APPA made this program as simple and straightforward as possible in order to serve the needs of the program participants. Standards and guidelines are framed by clear goals to assure the quality of the program.

APPA has considered what will bring real benefit to the students and employers involved in the program, and has integrated those elements. Program interns will get hands-on experience through participating in APPA activities and be able to build connections with facilities professionals. The host institution will also be able to focus on building a facilities network between the students, their institutions, and APPA.

> "For employers, internships can be a great way to take individuals on a 'trial run' to see how they change the company culture, make sure they fit in well with the existing group, and see how they work."
>
> — Nicole Smartt Serres, *Forbes Human Resources Council*

HOW TO JOIN

It is easy to participate in the APPA Student Internship Program, and members can post and view internships at no cost.

APPA members are encouraged to participate by posting student internships for summer and fall 2019. Follow the steps below:

- Step 1: Download and review the internship guidelines
- Step 2: Download and review the checklists
- Step 3: Check out the APPA resources
- Step 4: Post and find APPA internship opportunities

> According to a survey completed through the **National Association of Colleges and Employers in 2018**, those surveyed who completed at least one internship received a job offer more quickly and had a higher first-position salary than those who did not.

For more detailed information about the internship program, visit the APPA Student Internship Program webpage at *https://www.appa.org/JobExpress/internships.cfm.*

JOIN THE CHALLENGE

Through APPA Student Internship Pilot Program

Meet Bennet Krull, APPA Student Intern *(above left)*
Major in Renewable Energy
Office of Sustainability, Energy Management
Illinois State University

As a rising senior, I had the great opportunity to collaborate with the Director of Sustainability, Missy Nergard, on a campus map project as part of my independent study. A strong relationship was established with my supervisor, so I was offered

"My involvement with the Office of Sustainability has taken my college experience from just an academic level to a career jump-start level."

an internship opportunity to continue working on sustainable projects. My favorite part of the internship and of working here is the freedom to work on projects that interest me. Being allowed to work on energy savings and sustainability projects that benefit Illinois State keeps me motivated each and every day. One of the main projects was working on the parking garage lighting improvement. I conducted research in sustainable lighting to prepare a proposal and worked with various departments to make this sustainability idea a reality on campus. The funding was awarded to upgrade existing lighting with LED, which reduces energy consumption by 50 percent. This internship has benefited me by allowing me to explore how sustainability can have a positive impact on a college campus and how important it is for people to practice it.

Meet Igwe Nyeche, APPA Student Intern *(above left)*
Major in Occupational Safety and Health Management
Facilities Management
Grand Valley State University

My experience as a safety manager intern at Grand Valley State University (GVSU) was astounding. The amount of knowledge I gained and the opportunity for hands-on involvement in the field was truly priceless. Being able to work under David Cox, the safety manager at Grand Valley, taught me a variety of skills that relate to my occupational safety and health (OSH) management major. Some examples include learning about industrial hygiene, participating in a smoke-testing exercise in the GVSU football center to help find the source of a foul odor, fire-safety familiarity, and learning on how to extinguish a fire using a BullEx mechanism. I gained valuable real-world experience under Mr. Cox by having the opportunity to develop and assign safety

"The skills I acquired during my internship at GVSU were instrumental in my development as a promising OSH major and a future safety manager."

training programs for GVSU maintenance workers, perform follow-up work with online training, and keep track of their progress on recorded documents. I also conducted building inspections, and I checked for unsafe conditions or Americans with Disabilities Act (ADA) issues around the campus and developed a log to keep track of these situations for reinspection.

INTERNSHIP SUCCESS

From Student Intern to Full-Time Employee

"I am extremely fortunate and honored to work alongside a talented and inspiring group of people that are dedicated to transforming the facilities of our future leaders."

The digital multiplex (DMX) lighting controls project for the library tower was my favorite project during my internship. I successfully implemented an ergonomic design that provides remote controls for the library tower lights through a cloud platform. In addition to the library tower project, I analyzed the effect of fouled heat exchangers and how they impact our chilled-water distribution system. I also completed an APPA survey study demonstrating the oversizing requirements of building transformers and the potential to reduce the cost of electrical systems. I really enjoyed being able to go out in the field and understand the complexity and diversity of all the different mechanical systems. During the internship, I learned the steps involved in designing and coordinating technical projects; but most importantly, I was able to understand the importance of leadership in the management of an educational institution. After the internship, I stayed to become a full-time employee, because the challenges met by educational facilities inspired me, and I knew that I could make a positive contribution to this industry with the guidance of my mentor, David Handwork (above, right).

—Jonathan Howard, Facilities Engineer and Energy Conservation Manager, Arkansas State University

Interning at Illinois State University Facilities Management Department has been such a rewarding and incredible experience for me. As a project management intern, I was able to work on many projects. One of the main projects I helped with was being part of the data team to complete the APPA Facilities Performance Indicators (FPI) Survey. I applied the knowledge and skills I learned in classes to develop a data collection plan and to perform data analysis. Through this internship, I found numerous opportunities to allow my skills to shine and to develop new ones, such as teamwork, leadership, and communication. Having this internship ignited my passion to learn more about facilities and had a profound effect on my decision to pursue a career in education facilities. Thanks to my successful internship, aligned with the department's goals and strategic plan, the department saw the value of bringing an intern into full-time employment. I feel very privileged to receive this opportunity after the internship prepared me to be in this position.

"It was a great internship for me, because I had opportunities to grow not just professionally as an intern, but as a person."

—Mac Gao, Project Development and Data Administrator, Illinois State University

INTERNSHIP SUCCESS

From Student Intern to Full-Time Employee

"This internship was a rewarding experience that offered me a new set of skills and prepared me to comfortably step out of my academic world into my desired career path."

I had no clue what facilities are all about until I began connecting with facilities by starting an internship that was being offered. As an intern with facilities management, my primary responsibilities were assessing the department's business operations and determining how they could improve. The most memorable part of my internship was when I led the e-material checkout project. The initiative changed from manual data entry to electronic data processing through the use of iPads with the mobileTMA GO app. The internship gave me the opportunity to not only put my project management knowledge into practice, but to gain deeper insights into the facilities industry, which helped me significantly with my career planning. Besides being a regular student intern, I also got involved with APPA through participating in the Supervisor's Toolkit, where I developed relationships and built connections with facilities professionals. I was offered a full-time position, and I have now become a new "family member" of facilities services at Illinois State.

—Gig Supanichrattana, Data Analyst, Illinois State University

INTERNSHIP STORIES

From APPA Member Institutions

When I first began my journey in the facilities management world, I was unsure of the professional experience I would gain. I began as an intern with maintenance services at Western Michigan University (WMU). As a student majoring in communication studies, I did not know what role I would fulfill. It has now been close to four years since I began the journey, and I can confirm that my time in facilities management has allowed me to grow immensely in my career. As an intern, I worked on a number of projects, varying from creating an onboarding program for employees to assisting with workplace-culture initiatives. The most impactful project I worked on was sitting on the core committee to host the MiAPPA (Michigan APPA) conference at WMU. In this role, I organized the entertainment for the banquet night, and managed all the communication and marketing materials delivered to prospective attendees and then to the attendees themselves. My time working in facilities management has allowed me to become a more effective communicator and recognize the various factors that affect how a message is received. I am now aspiring to a full-time position with facilities management at WMU, as I graduated in spring 2018. While continuing my work after graduation, I have been able to build a social media initiative from the ground up, allowing our campus community to gain knowledge of what facilities does for the university. While much of the work is done in the background, being a part of that work and knowing the effect it has on the campus community is both exciting and fulfilling.

—Laura Kirkendall, Service Center Representative Western Michigan University

"I will always be grateful for the opportunities and connections I have gained from my intern experience."

INTERNSHIP STORIES *continued*

From APPA Member Institutions

When entering my first semester of graduate school, I was informed about an internship in the Maintenance Services division of the facilities management department at Western Michigan University. Once I was settled in and had an understanding of the organization, I was assigned my first big project. I had a long meeting with my predecessor and my supervisor, discussing how we could reduce workplace injuries. I was excited when I received the project, because I finally had an opportunity to apply the knowledge I learned in the classroom to the real world. After I fully understood the issue at hand, I began doing research on different solutions until I discovered one that would be fitting for our organization and culture. From the research, I developed the idea for "Toolbox Talks," which is a safety-awareness application that can be accessed via iPads assigned to employees for logging issues and concerns and assisting them with their work. When we started the implementation, I was nervous because we did not have immediate success. Yet, after a few months of running the program and helping everyone understand how to use it, we started to see improvements. After two years, we saw a significant difference in the reduction of Occupational Safety and Health Administration (OSHA) injuries. Due to the positive results, I was offered the unique experience of attending and presenting on the safety program at the MAPPA (Midwestern Region of APPA) conference. The project was an amazing learning experience, because I was able to see the program built from the ground up, something interns don't typically see. Not only did I learn a lot from this project, but it also gave me the needed experience to receive a position in my desired field right out of school.

"It is important to offer students real-world opportunities while studying; many times this is lacking in their classes. It's during their internship that they develop the relationships that provide them employment opportunities immediately after graduation."

—**Anand K. Sankey, Director of Maintenance Services, Western Michigan University**

"The internship helped me in many ways and I am very thankful for the time spent at WMU Maintenance Services."

—**De'Lon Dixon, Facilities Management Student Intern, Western Michigan University**

Former intern Gig Supanichrattana is a data analyst in the facilities department at Illinois State University in Normal, IL; she can be reached at *tsupani@ilstu.edu*. Mac Gao, also a former intern, is project development and data administrator at Illinois State, and can be reached at *hmgao@ilstu.edu*. Kristie Toohill is assistant director, facilities management, also at Illinois State, and can be reached at *klander@ilstu.edu*. Gig and Mac assisted Kristie and a team of APPA members and staff to develop the APPA Student Internship Program. This is Gig's and Mac's first article for *Facilities Manager.*

Scooting Around the Codes on Campus

By Clint Lord

One of the biggest trends campuses are seeing is the emergence and use by students of motorized-scooter rental services. These motorized scooters are suddenly found all over campus malls and public access points around universities. The scooters are unlocked with mobile apps and can be left wherever the rider finishes using them.

At Arizona State University (ASU), the problem became an unexpected nuisance very quickly, and we had to react rapidly to gain control of the rising tide of scooters showing up within campus boundaries. One of the many problems the university was faced with was that the scooters were being left everywhere, causing access issues into buildings and on public malls. There were also several fire code and fire egress issues that presented themselves with this new trend. And, we started seeing students charging scooters in dorm rooms to make extra income by using the charging model these scooter companies employ to keep their scooters charged and available.

CODES AND SCOOTERS

There are significant concerns with scooters and how they relate to the National Fire Protection Association (NFPA) codes:

NFPA 1, Section 11.1 addresses electrical safety.

Relocatable power taps might be used to add extra capacity to the receptacle; however, they must be connected directly to a permanently installed receptacle. "Daisy-chaining" the power taps is not permitted, and should not be done to plug in multiple scooters.

Extension cords must also be plugged directly into an approved receptacle, power tap, or multiplug adapter, and can only serve one portable appliance.

NFPA 1, Section 18.2 addresses fire department access.

It requires fire department access roads be provided for every facility, building, or portion of a building constructed or relocated. The required width and clearance of the access cannot be obstructed in any way, including the parking of vehicles. It would be a good practice for scooter riders to be aware of fire department access and not drop off scooters in fire lanes and other access areas.

NFPA 1, Section 14.4.1 requires means of egress be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

Means of Egress. An occupant's means of egress from a building includes exit access travel, the exit, and then the exit discharge. Exit discharge takes occupants from their exit to the public way (usually

outside the building). Scooters may be piling up near building's exterior doors or in a path of exit discharge unknown to the rider.

NFPA 1, Chapter 52 is constantly evolving to address larger type energy storage systems and the storage of batteries.

Lithium-ion battery fires are something that many industries continue to address and the electric scooters are no different. Lithium-ion battery fires are unique and cannot and should not be extinguished by an untrained consumer. They can cause problems for firefighters as well.

Americans with Disabilities Act (ADA) Issues.

The motorized scooters are impeding access throughout sidewalks, building entrances, hallways, and ADA ramps.

MITIGATING THE PROBLEM

ASU started meeting with the scooter companies to come up with a solution to the issues that have been plaguing the campus since these motorized scooters first started appearing there. These meetings were productive at first, but the university quickly realized the scooter companies were not able to fully control the users, and the problems persisted on campus.

After giving these companies a few months to work out a solution, ASU decided it was time to act, and banned the scooters from the interior core of campus. The university realized that this would not alleviate all the issues, but has implemented a few other solutions to mitigate the other problems:

- First, painted parking areas were created around the campus borders for the scooters to be parked in.
- Second, the Parking and Transit group on campus started to confiscate any scooters that were not parked within the designated areas. The companies were able to retrieve their scooters after the fines were paid.

FAR FROM AN ISOLATED PROBLEM

Since the university has implemented the ban, two of the scooter companies have started to fine their users if a scooter is left in an unauthorized area. They are also trying to implement a geofence solution that would slowly shut off the scooters once they enter the geofence borders. The companies hope that if they can get these solutions in place, universities across the country will stop banning their use and allow them back on campus.

In January 2019 the local municipality passed a license agreement to regulate scooter and dock less bike companies. The licensing agreement addresses safety, parking and staging, operations, data sharing and fees. Since the implementation of the license, a few of the scooter companies decided to remove their scooters from the city. Others have stayed to ascertain if the licensing fees are still a viable and profitable solution. This has greatly reduced the number of scooters on the ASU campus.

ASU is not alone, as this has been an issue for many universities and municipalities. Thankfully, the different building code authorities are working hard to introduce and implement new codes to keep our campuses safe.

Clint Lord is executive director of facilities services at Arizona State University in Tempe, AZ, and can be reached at *clint.lord@asu.edu.*

Building Blocks of Culture for Facilities Management—Part I, Values

By Matt Adams, P.E.

It seems like a good time for the APPA community to address "culture" in our organizations. Our college football coaching peers on campus can't do an ESPN interview without discussing the importance of culture for their respective programs. In the old days there were only two types of culture in the NCAA: winning or losing. That was way too simple, and coaches know it now. It would be like saying there are only two types of culture in facilities management (FM): productive and unproductive. There is so much more to culture than these simplifications.

To point out how much perceptions can change, Georgia Tech (GT) recently hired a new coach from Temple University, Geoff Collins. He emphasizes his vision of the new culture he will create at GT at every interview. He describes it as "cool, fun, and successful." It's only a matter of time before some of the leaders in our industry start defining the culture of their FM organizations with more colorful adjectives.

To start this discussion in the FM profession, we first need to understand the basics of culture. During a recent meeting I was asked by a leader at a well-known university to define culture. My first response was that culture is "the thing that guides the behaviors of every individual in our organization, especially when the leaders are not around."

It's a sloppy definition, I know, but more or less correct. And if you don't have a definition of your own to share with peers and direct reports, you had better get one. If you don't understand the concept, you will not be able to recognize your individual role in impacting the culture of your department.

BUILDING BLOCK 1: VALUES

The first building block of an organization's culture consists of the values it is based upon. Without values, an organization will adopt a culture based on the values demonstrated by the strong personalities of the organization or institution. These may not be admirable values. If you look back on your career, it's likely that you had at least one previous employer with an unhealthy culture. This happens when the leaders of an institution don't proactively build and manage culture in a positive way.

Organizational self-reflection is the best first step of this values determination. Unless an organization is brand new, a culture already exists there, and it needs to be understood. It's likely that some of the values it is currently based upon are not desirable.

For service-related organizations like those associated with APPA, the values that drive cultures fall into one of three areas: Hierarchical, Transactional, and Philosophical. To perform a self-assessment, a

working group can facilitate meetings to gather input from a broad cross-section of the organization, while answering questions associated with the three areas of their current culture.

Hierarchical

1) How is goal setting done within our department?
2) How are major decisions made to meet goals?
3) How are monthly and weekly decisions made?
4) Do employees feel empowered to make creative or proactive decisions?

Transactional

1) Do leaders actively assist direct reports in their pursuits?
2) Do peers actively support each other's success?
3) Is each level of management given approval authority for 80 percent or more of likely decision scenarios?
4) Can qualified staff perform their job with little or no approvals for supplies or tools?
5) Are budgets created at each level of the organization and utilized?
6) Is information shared between departments openly, with all information available online or upon request, or is it shared with some degree of difficulty?

Philosophical

1) What are the obviously unique characteristics of this workplace compared to other organizations where staff have worked previously?
2) Do we emphasize people or performance?
3) Which is more important, celebrating successes or avoiding mistakes?
4) On a scale from 1 to 10, how does each level of the organization rate the openness of communication they receive from higher levels?
5) What level of concern/benevolence do employees feel that the department demonstrates toward them and their family?
6) Does the department embrace a diversity of backgrounds and opinions?
7) Does our institution trust its employees?
8) Are employees encouraged to grow professionally even if it might mean they eventually move on?
9) Do our employees feel secure in their jobs?

Some might believe that doing this forensic look at their existing culture is a waste of time, but the opposite is true. This exercise provides many profound benefits. First, it affords the trades group of the department—who make up the largest percentage of the staff—a powerful reason to meet and discuss the issues that affect them daily. In addition, if done slowly and methodically, it allows those who are hesitant to contribute an opportunity for freedom of thought and expression. In other words, one could poll senior leadership about these questions and get a relatively quick and concise answer. However, those answers are not likely to represent the culture experienced by most of the staff—and therefore will not give an accurate portrayal.

Finally, this exercise educates participants about the nature and intricacies of culture. We can learn about culture by seeing the culture our department is already immersed in from a new perspective. This exercise should result in a group of common themes that emerge from the answers provided by a broad spectrum of participants from the department. These repeating themes can then be further condensed into three to five characteristics or values—or perhaps even negative values if necessary. It is important to recognize the positive values demonstrated in our current cultures, so as to avoid disrupting the good that we find there.

COLLECTING THE EVIDENCE

Once our staff has helped identify the themes of the current culture, the next step is to point out examples of the "evidence" or "artifacts" of these themes. This too has a therapeutic and educational benefit for our staff as well as for leadership. For each theme, participants should prioritize the artifacts that illustrate current cultural themes. These artifacts have either been actively created or passively accepted by our organization. Our understanding of their nature allows us to better design, create, and sustain new artifacts for the future culture we desire.

Artifacts might be processes, practices, behaviors, or even physical items. For example, suppose that a theme for your department is "low trust." Some artifacts to illustrate this characteristic could be low approval limits for materials, locked storage cages for equipment, multiple time-tracking processes, and other such issues readily seen in our industry. Doing this work ultimately defines the specifications of the culture you presently have in place. It is documented, shared, and discussed for the reasons previously mentioned. This is far more effective than having staff sit through theoretical, didactic lectures about culture.

Once the themes have been fleshed out, the stage

is set to define the positive values you want to base your culture upon. The "positive" aspect of these values comes from fact that they are selected by the leadership to align with the greater strategic plan of the institution. These values may be a set of more than five, and the department allows staff to weigh in on those they see as most valuable. From this larger group of values, a smaller group of three to five are selected. By definition, value descriptors are short and easy to understand. Jeff Marcinkowski, the maintenance supervisor at Grand Valley State University (GVSU), shared his institution's values and a plan for building culture around them at APPA U recently.

The GVSU cultural values shared by Marcinkowski are family, individual health, and teamwork. GVSU has an organized and repeatable strategy for building a culture around these values. It's important to notice that there are only three values named. More than five is too many to allow the focus required to create a culture. Selection of these values is a group effort and must include input from the entire organization, if possible. Some examples are transparency, collaboration, responsiveness, quality, respect, individual growth, and diversity.

MORE TO COME

The next step in building culture is the strategic building block. This step may actually be a part of the overall departmental strategic plan, which is preferable, but sometimes the two initiatives are not so conveniently aligned chronologically. I will address the cultural strategy in the next piece on culture.

Matt Adams is president of Adams FM², Atlanta, GA. He can be reached at *matt@adamsfm2.com*.

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APPA U in Fort Worth Showcases New Programs in APPA's CLS

By Corey Newman

The January APPA U in Fort Worth, Texas, showcased another successful professional development gathering of the Institute for Facilities Management and Leadership Academy. Colleagues from around the globe came to learn, network, and collaborate.

We are grateful for the dedicated faculty who make these offerings such a success. A special note of thanks goes to our Institute Deans: **Mary Vosevich**, **Chris Smeds**, **Lynne Finn**, and **Don Guckert**; and to our Academy Faculty: **Paula Farnsworth, Glenn Smith, Shawna Code, Viron Lynch**, and **Matt Adams**.

At this event, we offered three new programs as part of **APPA's Continuous Learning Series (CLS)**:

- *ASHRAE's HVAC Design: Level I—Essentials: Tools for High-Performance Building Designers*
- *Leading Your Facilities Organization through an Age of Transformational Change*
- *COAA Owner Training Institute Program*

Throughout the week, students had opportunities to interact with experts who brought their extensive knowledge and experiences from diverse backgrounds and provided a rich environment for all attendees. Approximately 500 facilities professionals from across the United States, Canada, and Saint Kitts and Nevis attended.

As the week drew to a close, we celebrated with graduation ceremonies for the class of January 2019 (including 66 new alumni). A big kudos to all those institutional leaders who supported the professional development of their staff!

The professional development of any individual must be as customizable as the individuals themselves, and APPA is here to help everyone achieve their personal, organizational, and institutional goals.

Corey Newman is APPA's associate director of professional development and can be reached at *corey@appa.org.*

Academy Graduates

Photos by Rhonda Hole

Institute Graduates

ACADEMY GRADUATES

In alphabetical order; not all graduates are pictured

Toby Badura, *University of Nebraska at Kearney*

Karen Crabbe, *The Ohio State University*

Edwin Dixon, *University of Alabama at Birmingham*

Doug Hammerle, *Miami University*

Garry Hodges, *Dallas County Community College District Office*

Felicia Johnson, *Rio Hondo College*

Michael McCord, *University of New Mexico*

Funke Olufunke, *University of Houston - Downtown*

Michael Pavone, *University of Rochester*

Ralph Savage, *Southern Utah University*

Nick Sciaccotta, *Joliet Junior College*

Sheri Sipes, *University of Arkansas at Pine Bluff*

James Stephens, *Florida State University*

Robert Still, *East Carolina University*

Loren Swanson, *University of Nebraska - Lincoln*

Sandra Vail, *University of Arkansas at Little Rock*

Andrijana Vukovich, *University of Arkansas at Little Rock*

Kyle Williams, *Brigham Young University - Idaho*

Jeff Wynn, *Brigham Young University - Idaho*

INSTITUTE GRADUATES

In alphabetical order; not all graduates are pictured

Lashea Alexander, *Florida State University*

Ann Marie Arthur-Nedrick, *Emory University*

Andy Bruckner, *University of Iowa*

Kevin Bucy, *Indian University Bloomington*

Rosanna Carvalho, *Washburn University*

Daniel Cassidy, *University of Iowa*

Chris Charnegie, *Northern Kentucky University*

Maureen Clarke, *Oregon State University*

Michael Anthony Cortez, *University of Arizona*

Carol Dargin, *Wayne State University*

Jerry Emerson, *University of North Texas Health Science Center*

Mark Douglas Flaugher, *University of Michigan-Ann Arbor*

Kenneth D. Frederick, *Pennsylvania State University*

Joe Gamble, *Portland Community College*

Robert Gavlock, *Pennsylvania State University*

John R. Gillette, *Community Colleges of Spokane District 17*

Ryan Golas, *Pennsylvania State University*

Krishna Gayle Hobbs, *University of Kentucky*

Mylon Kirksy, *University of Texas at Austin*

Christopher Kornahrens, *Notre Dame De Namur University*

Seth T. Lambert, *University of West Georgia*

Brian Larson, *University of North Dakota*

Dorrene R. London, *University of Rochester*

Michael Mannhalter, *South Dakota School of Mines and Technology*

Chris Marrs, *Dallas County Community College District Office*

Rick Martinez, *Belton Independent School District*

Kristofer M. McGee, *University of Rochester*

David A. Nelson, *University of Rochester*

Kari B. Nguyen, *University of Rochester*

Eric Nichols, *Ithaca College*

Paul David Olshavsky, *Case Western Reserve University*

James Parker, *University of Arizona*

Jeffrey Parsons, *Cornell University*

Steven Edward Pavelec, *University of Northern Iowa*

Doris Reeser, *University of Illinois at Urbana-Champaign*

Raphael Rocha, *Portland State University*

Jeremy Russell, *East Carolina University*

Nicole Sanderson, *University of Washington Bothell Campus*

Phillip Schaefer, *Arizona State University*

Jenny Schnase, *University of Nebraska*

Teri Sieve, *The University of Iowa*

Aaron Jeffery Sommerville, *Whitworth University*

Jeff Sweeden, *Oklahoma State University*

Julie Sychra, *University of Iowa*

Kelly Trefil, *Michigan State University*

Scott A. Warner, *Purdue University Main Campus*

Sarah Lynn Young, *Monmouth College*

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

The facilities industry is all about people, customers, and service providers. Understanding the interface between these groups and leading a service-providing team is more important today than it has ever been. These books lead to several other books on tap for the year that will help facilities officers.

MILLENNIAL RESET: REIMAGINING A WORKPLACE THAT WORKS FOR EVERYONE

Mary K. Pilotte, with Amber L. Cross, 2018, 99 pp., softcover, $19.95.

There are many books about the workplace. These books attempt to tell one how to be a good leader of people, create an open and welcoming workplace, and manage change (either technological or organizational). But there really aren't many books that identify how to deal with the changing workforce as exhibited by the cohort born between 1981 and 2004—the *millennials*.

We know much about this group: They will make up 75 percent of the workforce by 2025, they were raised by "overprotective" parents, they are open and sharing with others, and so on. Some of these characteristics are viewed as good, while others are viewed as problematic by thinkers such as Simon Sinek. But the fact that they will make up 75 percent of the workforce in just a few years is a reality that cannot be ignored.

Millennial Reset presents the changes necessary to keep and maintain a productive business enterprise and to manage differences between Gen-Xers and millennials. Since change cannot happen without knowing where one has started from, the first half of the book sets the baseline. What are the characteristics of the working generations (baby boomers, Gen-Xers, and millennials)? What makes each tick? Whom do they recognize as role models representing ideals of behavior? Knowing the characteristics of and differences between these generations helps identify the challenges a manager or leader faces to keep the workplace functional and productive.

There are plenty of problems facing a business manager or leader when mixing these generations. Their differences can be extreme—to the point of seeming polar opposites at times. Here are the broad generalizations: Baby boomers tend to challenge authority based on their experience with war protests and civil rights. Gen-Xers tend to focus on social status and material possessions. Millennials, while generally resisting codes of conduct, usually don't separate their personal lives from their professional lives. These perceived differences highlight the difficulty of managing opposites while trying to get a multigenerational workforce moving in the same direction—it can be very frustrating.

Millennial Reset provides numerous ways to deal with these generational differences and to integrate them into a smooth-functioning organization, with some thought. The balance of the book describes ways to weave the "overwhelming" characteristics of millennials into a corporate setting and to combine the best management and leadership techniques for boomers and Gen-Xers into tools that will also work with millennials. These tools come from Pilotte's decades in the corporate world, combined with her research and her experience in higher education; at Purdue, she currently works with millennial graduate students and teaches the upcoming Gen-Z.

Pilotte discusses tools such as modifying one's communication techniques to articulate goals and expectations frequently, and providing rapid feedback when work is done well (and avoiding criticism). Of course, communication channels such as social media are another important tool for managers and leaders to utilize. As Pilotte points out, communication with millennials means not only listening frequently to their ideas and feedback, but also paying attention to what benefits are important to them. Some of these techniques are not new, but Pilotte includes nuanced changes that work with the millennials.

Each chapter includes a "bottom-line" and "takeaway" summary of reminders and activities to help

you practice the recommendations described. The book offers ways to validate and compare employee characteristics (which may vary despite the generational monikers), and how to leverage their differences into a more cohesive workplace.

The book might be considered a little late in the game as we near the end of the Gen-X entry into the workforce, but it does give us tools we can use to begin assessing the upcoming Gen-Z employees. It will be interesting to see if Pilotte develops a guide for the next generation, so that workplace managers and leaders can be better prepared to succeed. In the meantime, this book is a convenient and handy addition to any supervisor's reference library if they desire to both improve corporate culture and maintain their peace of mind.

SUBSCRIBED: WHY THE SUBSCRIPTION MODEL WILL BE YOUR COMPANY'S FUTURE—AND WHAT TO DO ABOUT IT

Tien Tzuo, Portfolio, 2018, 256 pp., Available in hardcover, softcover, ebook, audiobook.

A repeating dictum is that the United States is now a service economy; a manufacturing (products) economy no longer dominates national enterprises. There's a reasonable description of this change in business perspectives in *Subscribed*, by Tien Tzuo. As Tzuo explains it, business owners once looked to make products more efficiently so they could then market and sell them in increasing numbers; so their fixed cost of production became smaller, and due to the results of marketing, they could raise the price of their products and thus increase profits. All that has changed. Successful companies are no longer focused as much on marketing their products as on getting customers to engage in an ongoing relationship through a subscription for service.

The next question may be, "What does that mean for an educational facilities manager?" The question is unexpected because facilities management (FM) is a service industry—how is a service industry affected by an overall change from acquiring products to services? As discussed in several other reviews, understanding the supply side of the business will help FM providers identify how to better manage the demand side. Indeed, the education industry may be changing toward a subscription focus, thus affecting the facilities organization.

Consider the possibilities discussed in *Subscribed*. As businesses switch from producing an individual product to sell into making that product a service obtained through a subscription, the business must convert more than just the financial ledger. There's an attitude change needed. For a subscription fee, the business provides a service that is continuously updated and improved through feedback from the subscriber. It's almost as if you must offer pure, continuous improvement. Do you want to communicate with someone on the other side of the city, state, nation, or world? Use your subscribed smart device and choose audio only or Facetime. Do you want to create documents for reports or presentations? Use your Office 365 subscription and cloud storage to collaborate with others. The next step may be a subscription to a learning environment where the subscription (rent) means regular renovations and upgrades to the physical and cyber environment.

Are we ready for this kind of subscription for learning? What happens if the education industry sells subscriptions for continuous learning? Will we see education facilities in more locations or will their physical presence disappear into online-only education delivery? The jury is still out. But *Subscribed* should get you thinking—it certainly has me thinking.

Ted Weidner is an associate professor at Purdue University and consults on facilities management issues primarily for educational organizations. He can be reached at *tjweidne@purdue.edu.* If you would like to write a book review, please contact Ted directly.

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APPA's Leadership Academy provides leaders with the wisdom, skills, vision, and confidence to EFFECTIVELY build TRUST-based CULTURES. Here is a current listing of sessions that will be offered throughout the APPA membership:

April 16-18, 2019	Level 2	University of North Carolina/Charlotte
May 7-9, 2019	Level 1	Aims Community College (Greeley, Colorado)
May 15-17, 2019	Level 1	University of Memphis (Memphis, Tennessee)
June 18-20, 2019	Level 1	University of Washington/Bothell
June 25-27, 2019	Level 1	Occidental College (Los Angeles, California)
July 30 – August 1, 2019	Level 1	California State University/East Bay
September 25-27, 2019	Level 2	Rhodes College (Memphis, Tennessee)

Registration for all of the sessions above is now available via www.appa.org.
Tuition for all sessions is $995 per day and participants will be released daily for a one-hour lunch break.
For additional information, please contact education@appa.org.

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new products

Compiled by Gerry Van Treeck

ARGCO introduces the AMFE (Automatic Mini Fire Extinguisher). An innovative product for standalone, device-integrated fire protection, the AMFE is designed to detect and extinguish a fire inside electrical devices, preventing the spread of a fire. Features include automatic mechanical release—it works just like a sprinkler head. The unit is compact, with a selection of heavy-duty cylinders in sizes from 2.4 oz. to 8.8 oz. It is easy to install, with no complicated controls. It works as a standalone and does not interfere with existing life-safety systems. Reporting and signal connection are available for monitoring. For additional detailed information on ARGCO visit *minifireextinguisher.com*.

PREFERRED UTILITIES MANUFACTURING CORPORATION offers the new FlexFit system, an innovation in linkageless technology. The FlexFit solution offers a less costly, less time-consuming retrofit to modern linkageless controls in the boiler room. Leveraging the industry-leading BMU (BurnerMate Universal) platform, the FlexFit can be used in new installations or be easily retrofitted into existing jackshaft control panels that use supported common flame safeguards. This solution is half the price of the BMU (with the same benefits), and a trained technician can install the FlexFit in one day. For more information about Preferred Utilities Manufacturing Corporation visit *www.preferred-mfg.com*.

OVERHEAD DOOR brand's performance solution, EverServe—one of the first commercial door solutions to feature a springless barrel design with integrated shafts and an extended 500,000-cycle-life warranty—has earned a Product Innovation Award from *Architectural Products* magazine. Through its pioneering springless design, EverServe models 610S, 620S, and 625S provide 25 times the life of a standard door-spring cycle life, delivering longevity and reliability while cutting the costs of spring replacements and downtime. For more information go to Overhead Door online at *www.overheaddoor.com*.

KNIPEX Tools introduces a 7.25 in. size to the original 10-in. Hose Clamp Pliers for Click Clamps. The Hose Clamp Pliers are designed to easily and efficiently open and close click-clamp applications in all positions. The pliers are built to not damage the compressed clamps, allowing the clamps to be used repeatedly. Designed for work on fuel hoses, vacuum pipes, suction nozzles, and many other applications, the series features maximum leverage for opening and closing clamps without much effort. Rotatable tips reliably grip click clamps in all positions. The new 7.25 in. Hose Clamp Pliers are forged and oil-hardened out of German chrome vanadium steel and feature a slim head design for working in confined spaces as well as serrated gripping jaws for easy loosening of tight hoses. For more information on KNIPEX Tools visit *knipex-tools.com*.

EXTECH, a test and measurement tools manufacturer, announces the launch of the IR320, a ruggedized, dual-laser infrared (IR) thermometer designed to tackle tough jobs indoors and out. This new thermometer is designed for electrical contractors and plant

maintenance technicians who face an array of temperature diagnostic challenges, from overheating motors and pumps to corroded electrical connections, failed steam traps, and premature wear on processing equipment, as well as faulty HVAC and refrigeration systems. Extech designed this full-size infrared thermometer, also known as a spot IR pyrometer, to withstand rough duty. The IR320 survives falls off a ladder from heights up to nearly 10 ft. (3 m). With an ingress protection rating of IP65, the meter is dustproof and easily handles wet environments, from rainy outdoors to water-intensive manufacturing processes. For further information on Extech click on *www.extech.com/IR320.*

VIEGA introduces MegaPress Stainless XL fittings for 2½-in., 3-in., and 4-in. pipe. The new fittings join the current MegaPress Stainless offerings of ½-in., ¾-in., 1-in., 1½-in., and 2-in. sizes, to create a comprehensive lineup for a broad variety of applications, including maintenance and repair. Designed for Iron Pipe Size (IPS) stainless steel, the new line of MegaPress Stainless XL fittings makes secure connections in seconds, which helps keep a project on time or ahead of schedule. MegaPress fittings reduce installation time by up to 90 percent compared to traditional pipe-joining methods. Additional information about Viega can be found at *www.viega.us/mpstainless.*

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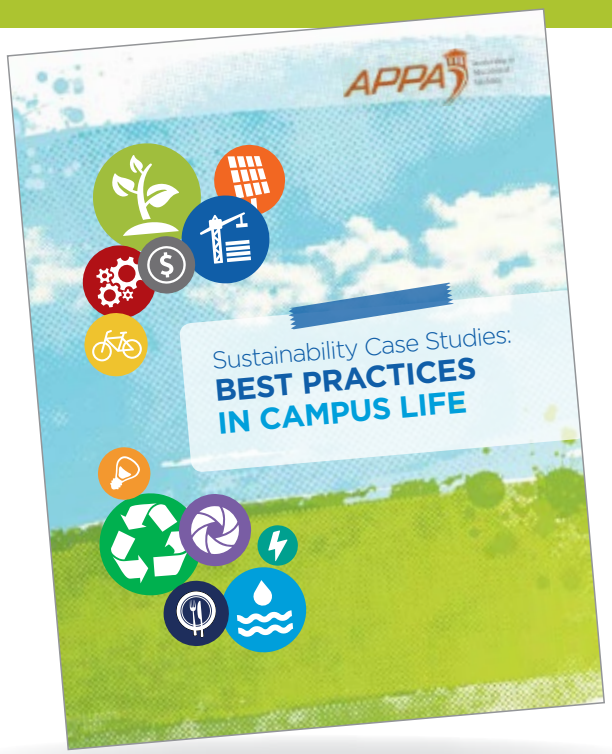

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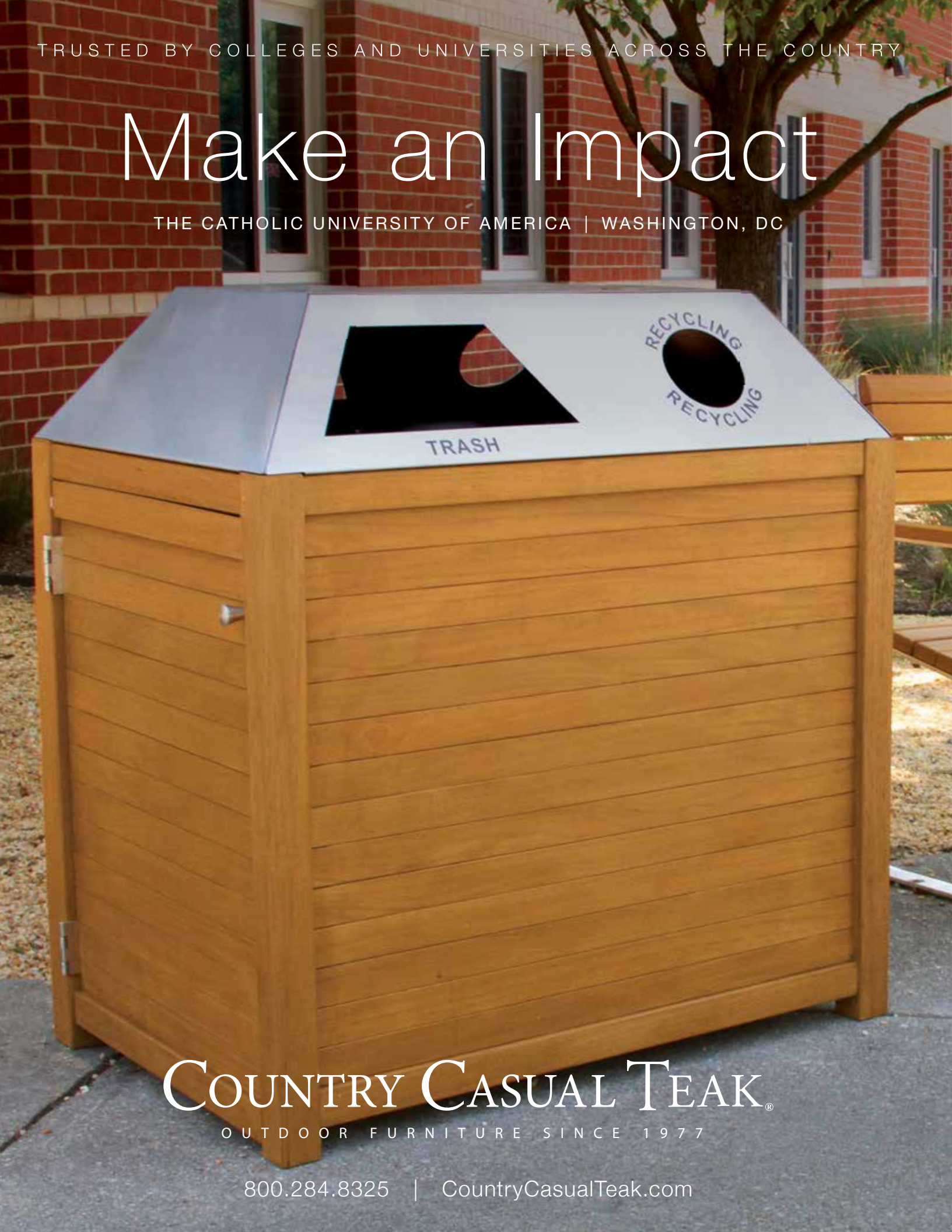
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