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VOLUME 13

NUMBER 1

# Facilities Manager

The official publication of APPA: The Association of Higher Education Facilities Officers

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## From The Editor

Steve Glazner

**Welcome** to the first bimonthly issue of *Facilities Manager*. After twelve years as a quarterly magazine, *Facilities Manager* will now be sent to members and subscribers six times a year. Recent readership surveys have told us that you find the magazine to be informative, reliable, and valuable, and that you would like to see it more often. We're happy to comply, and we look forward to bringing you future issues on deferred maintenance, grounds management, new technologies, and much more.

This issue of *Facilities Manager* looks at energy deregulation and where it may lead educational facilities in the near and not-so-near future. We've included an overview of deregulation, a power wheeling success story, a report on APPA's Opportunity Assessment workshops, and a description of the EPA's Energy Star Buildings program. In Perspective, you'll also find a cautionary message on energy deregulation.

We welcome back our regular columnists Wayne Leroy (Executive Summary) and Val Peterson (Focus on Management), as well as The Bookshelf, coordinated and edited by John Casey. Howard Millman's

Software & Solutions will return in the March/April issue.

We'd also like to take this opportunity to introduce you to two new columns. Strategically Planning is a six-part series designed to take you step-by-step through the important process of strategic planning. It is written by James and Susan Cole, who have worked with APPA and a number of institutions in setting long-term goals as well as the strategic initiatives to help you get there.

Matt Adams' Facility Asset Management column provides a natural follow-up to APPA's recently published report on deferred maintenance, *A Foundation to Uphold*. This new column will present strategies for reducing your deferred maintenance, discuss ways to increase your positive visibility on campus, and share success stories and best practices from institutions that are applying innovative approaches to correcting this \$26 billion problem.

Your comments and suggestions for both new columns, as well as for the entire magazine, are always welcomed. Please contact me at [steve@appa.org](mailto:steve@appa.org).

Happy new year and the best of success in 1997. ☺





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### Does APPA Need?

by Ronald T. Flinn, APPA President  
Michigan State University



**I HAD** the opportunity to visit five of the North American regional meetings during September and October. Because SRAPPA and PCAPPA were scheduled at the same time, I asked President-Elect Tom Vacha to attend the Pacific Coast meeting while I attended the Southeastern; Tom also attended Australasia in September. At all the regions they asked that we clarify what we're doing with certain committees, and I agreed to develop this article for *Facilities Manager* to better explain what we've done and why.

The committee structure within APPA has four permanent committees—Professional Affairs, Information Services, and Educational Programs, each chaired by an elected vice president, and the Nominating Committee chaired by the Immediate Past President. The ad hoc committees, Small College and Awards and Recognition, have been reestablished as task forces for 1996–97, and the International Relations Task Force has been extended for an additional year. Although not mandatory, membership on an ad hoc committee is made through annual appointment and rotates after two years of service. Declaring it a task force facilitated leaving the membership the same, which provides continuity and an experienced base to address the issues. Also, the phrase “task force” does a better job of conveying the fact that a challenge needs to be addressed and accomplished in a relatively short time. Membership continues as a standing committee

chaired by a member of the Board of Directors whom the Board appoints.

#### The College Task Force (formerly Small College Committee)

During the past year, many questioned the need to continue the Small College Committee. After speaking with this group at the annual meeting in Utah, I was surprised to find at least three committee members were from institutions with more than 10,000 students. The discussion that followed revealed that they are the only trained facilities manager in their physical plant departments, and consequently they are called upon to wear many hats to be successful. Don Long of Australasia observed that size of the institution does not differentiate the role of the physical plant director. The more important question is, “Do you manage activities, or do you manage an organization?” These members think there is a need for APPA to focus on topics and programs that will help them be successful, and help train and professionally develop their staff. Therefore, I asked the group to continue as a task force with Don Long as the chair, and to focus their efforts on the following:

1. Identify the activities APPA needs to promote and/or provide to assure it is the association of choice for those with a very limited physical plant organization.
2. Is there a need for an ongoing mechanism—committee, task force, etc.—to assure a continual focus for the “college” interests?

What is the proper location of this mechanism—international, regional, chapter, or state?

#### Awards and Recognition Task Force

Awards and other forms of recognition are tangible symbols of a person's professional development and service. Recognition of the accomplishments of a physical plant organization is almost always accompanied by recognition of the leaders of that organization, and so there seems to be a strong link between the goals of the Professional Affairs Committee and the Awards and Recognition Committee. Thus, I asked the committee to become a task force chaired by Randy Turpin and to report to the Vice President for Professional Affairs to accomplish the following:

1. Continue to perform as the Awards and Recognition Committee for 1996–97.
2. Review all APPA's awards and recognition currently in place and address the following questions:
  - a. Are the current awards appropriate and adequate?
  - b. Are we getting an adequate level of participation from members in identifying candidates/nominees?
3. Recommend how the awards and recognition activity is best struc-

(continued on page 7)



**FACILITY CONDITION ANALYSIS**

• elevator engineering • infrastructure: utility analysis • energy systems: evaluation and design • power plant: cogeneration analysis • operations and maintenance analysis • construction management • deferred maintenance / capital renewal management • security analysis • facility condition analysis • elevator engineering • infrastructure: utility analysis • energy systems: evaluation and design • power plant: cogeneration analysis • operations and maintenance analysis • construction management • deferred maintenance / capital renewal management • security analysis • facility condition analysis •

**ELEVATOR ENGINEERING**

• operations and maintenance analysis • elevator engineering and maintenance analysis •

**INFRASTRUCTURE: UTILITY ANALYSIS**

• operations and maintenance analysis • elevator engineering and maintenance analysis • elevator engineering • infrastructure: utility analysis • construction management • infrastructure: utility analysis • maintenance analysis • construction management • infrastructure: utility analysis • management • deferred maintenance analysis •

**ENERGY SYSTEMS: EVALUATION AND DESIGN**

• construction management • utility analysis • energy systems: evaluation and design • deferred maintenance / capital renewal management • deferred maintenance analysis • energy systems: evaluation and design •

**DEFERRED MAINTENANCE / CAPITAL RENEWAL MANAGEMENT**

• infrastructure: utility analysis • management • deferred maintenance / capital renewal management •

**SPACE UTILIZATION, MASTER PLANNING**

• operations • facility condition analysis • management: cogeneration analysis • analysis • facility condition analysis • operations • facility condition analysis • operations and maintenance analysis • elevator engineering

**POWER PLANT: COGENERATION ANALYSIS**

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**OPERATIONS AND MAINTENANCE ANALYSIS**

• construction management • infrastructure: utility analysis • construction management • infrastructure: utility analysis •

**CONSTRUCTION MANAGEMENT**

• elevator engineering • maintenance analysis • construction management • elevator engineering • maintenance analysis • construction management •

**SECURITY ANALYSIS**

• management • deferred maintenance / capital renewal management • security analysis • facility condition analysis • elevator engineering • infrastructure: utility analysis • energy systems: evaluation and design • power plant: cogeneration analysis • operations and maintenance analysis • construction management •

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tured for the future. Can the current Professional Affairs Committee handle it? Should there be a subcommittee reporting to the Vice President for Professional Affairs, or should there be a separate standing committee? Should the unit include past presidents who might provide a more global view of APPA and the importance of awards?

### International Relations Task Force

In reviewing the necessity of continuing the International Relations Task Force, many members opined that "our progress in other parts of the world is not as dynamic as it should be." I hear the word "national" ten times as often as "international" when members refer to APPA, even though Australasia is one

of our regions. Therefore, I've asked the International Relations Task Force, chaired by Roy Dalebozik, to take on the following challenges:

1. Continue to cultivate interested institutions in other nations, such as South Africa.
2. Expand active involvement and meaningful participation of additional international members via *International Communique* as posted on APPANet.
3. Determine how best to align our international effort with APPA's vision and strategic initiatives.

In recent years, our president has attended the annual meeting of the Association of University Directors of Estates in the British Isles, and reciprocally their president has attended our annual meeting. As pleasant as this exercise is, I'm concerned that there is no significant exchange of

information, such as the presentation of papers, and there isn't any formal linkage or partnership between the two organizations. I will be communicating with the president of the Association of University Directors of Estates in an attempt to make such an agreement a reality, and we need to pursue such an arrangement with similar associations if they exist in other countries.

I certainly have no preconceived notions of the best committee structure for APPA as it enters the twenty-first century. A proliferation of committees offers opportunities for members to participate at the international level; however, committees that have little challenge are not cost effective.

Your opinions and thoughts would be very much appreciated. Please contact me via e-mail at [rtflinn@pplant.msu.edu](mailto:rtflinn@pplant.msu.edu).

## From the Vice President for Educational Programs

by Gary L. Reynolds  
Iowa State University

APPA's Educational Programs Committee is off to an ambitious start with the development of a number of initiatives. The educational programs are receiving outstanding support from a number of talented people as we work toward APPA's vision of a Global Partner in Learning. APPA's strategic plan, objectives, and initiatives are providing guidance to the committee's efforts. As a reminder, the two significant objectives are:

1. Increase meaningful participation and involvement of APPA stakeholders.
2. Provide all APPA stakeholders equal access (in terms of convenience, cost, time) to educational/learning opportunities.

These two objectives have lead to a number of strategic initiatives with

one of particular interest to the committee—increase the effectiveness of education for APPA stakeholders. With this guidance in mind, the committee has undertaken an extensive program of review and development activity. Literally no program APPA currently offers is going unscrutinized.

The committee members guiding these efforts are Mike Besspiata III (Southern Baptist Theological Seminary), Gordon Bulat (University of Alberta), Jim Demarest (Illinois State University), Arthur Jones (Black Hills State University), Fred Klee (Ursinus College), Berger (Buzz) Nelson (University of Nevada/Reno), and Denis Stephenson (La Trobe University, Australia), and APPA staff liaison Kathy Smith.

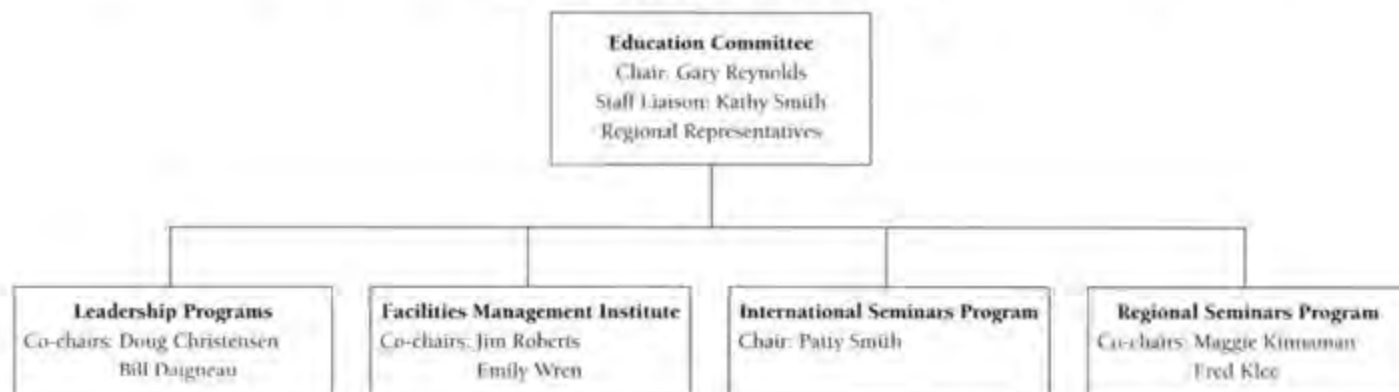


In addition, other volunteers are providing outstanding support for APPA's educational effort. The organizational chart on page 8 outlines the structure of the committee and the key roles of our members.

As you can see we have an excellent group of talented people. And there is still more. The Institute for Facilities Management is currently undergoing a complete curriculum

# APPA: Association of Higher Education Facilities Officers

## Education Committee



review with some important changes planned, and another group of talented people has stepped forward to help with this endeavor: Don Briselden (Philips Exeter Academy), Jay Klingel (University of Virginia), Don Guckert (University of Missouri), and Mo Qayoumi (University of Missouri/Rolla).

### The Annual Meeting

The charge to the Educational Programs Committee is to provide oversight and guidance to APPA's educational programs and to specifically address issues of the annual meeting. While the annual meeting has provided APPA's members with a number of educational and networking opportunities, it is clear that our members' rising expectations for the meeting will be a challenge to the committee. The leadership of the regions are doing an excellent job of providing quality experiences at the regional annual meetings, and these excellent programs are meeting the needs of many of our members. The challenge to APPA's Educational Programs Committee and APPA staff is to explore the role of APPA's annual meeting in providing a distinctly different experience with true "value added" not available at the regional level.

The committee will be making this a high priority issue.

### Leadership Programs

APPA targets several programs to upper administrators or facilities leaders, including the Executive Institute at Notre Dame, the Institute for Facilities Finance, and the more recent Foundations of Leadership program.

Through the excellent work of John Harrod (University of Wisconsin/Madison), Emily Wren (Indiana University/Purdue University at Indianapolis), and Barry Van Dyke (Notre Dame), the Executive Institute has been completely revamped. This entirely new program was offered for the first time in April 1996 and received excellent reviews from everyone who attended. This outstanding program now provides an intense week of study and networking on such topics as strategic thinking and planning, innovative leadership concepts, negotiating skills, organizational transition management, media relations, and much more. I attended this new program and I highly recommend it for those interested in a quality leadership educational experience.

The annual Institute for Facilities Finance continues to be well attended. It too has been recently updated. New to the program is a four-hour session on leadership entitled, "Partnerships at Work." A session has been added providing examples of leadership in financing capital renewal and the reduction of the deferred maintenance backlog. Also, the results of the recently completed APPA/NACUBO/Sallie Mae report, *A Foundation to Uphold*, were presented at November's session.

The Foundations of Leadership program has been a successful program providing a unique personal growth experience. Through generous support from Marriott Educational Services and the Covey Leadership Center, the 3½-day program provides opportunities for the development of personal leadership skills, organizational development, and change management. The program is offered concurrently with the Institute for Facilities Management.

Despite the success of the various leadership programs, a review has been started under the leadership of Doug Christensen and Bill Daigneau. Their charge is to develop a plan, by June 30, 1997, that will integrate our leadership efforts into a more coherent, coordinated, and meaningful program.



## Institute for Facilities Management

The Institute is undergoing a substantial overhaul. Many changes in our profession were having a tremendous impact on the Institute. Many important issues were not being presented due to the lack of time, some of the current courses were redundant or no longer relevant in their current form, and expectations for quality presentations were rising. As a result, a complete curriculum review was undertaken. The review started with a weekend retreat in May 1996 in Alexandria generously sponsored by Cutler Hammer and Stanley Consultants, Inc. The result of this review is a proposed new format that will be four weeks long, rather than the current three weeks, and will include entirely new courses in administration, operations and maintenance, capital projects, and utilities. In addition, the Institute subcommittee is looking at ways to provide access to the courses in a more flexible and personalized way. Our goal is to begin implementing the new program in September 1997 or January 1998.

## International Seminars

APPA also sponsors one-to-two-day seminars that are offered at various locations around the country. In addition, we are developing partnerships with various associations to provide educational opportunities for our members. APPA has done a good job of being responsive and flexible in providing seminars on fairly short notice on topics of current interest to our members. Patty Smith (Rutgers) is examining this process to see if it still meets our members needs. In the meantime, our current plans include a seminar on Planning for Master Planning to be offered in Berkeley, California March 17-18, 1997. Although at this time the locations

and exact dates are unknown, a seminar on Building Commissioning and a Leadership Symposium will be offered sometime in March 1997.

## Partnerships in Educational Training Programs

Perhaps one of our most exciting developments is the regional drive-in training program, called Partnerships in Educational Training (PET). This new program uses APPA's connections with speakers on topics of importance to our members plus APPA's expertise in organizing programs.

The PET series will allow members to participate in a half- to full-day seminar on a very targeted topic right in their own neighborhood. The concept is very simple. An institution interested in hosting a PET program contacts the APPA office and indicates which program they would like to host and when. The host institution then provides an on-site coordinator, a meeting room capable of holding 25 to 60 people, audiovisual equipment, and directions and information on local hotel arrangements. They then contact friends at local institutions using APPA supplied literature to let them know about the meeting. APPA will provide a broader mailing to institutions in your area, make arrangements for the speaker, provide training materials for all participants, handle registration and collection of fees, and provide promotional materials and other on-site materials such as an attendee list and evaluation forms. The anticipated cost is \$99 to \$129 per person assuming a minimum attendance of 25 people.

APPA is currently providing PET programs for topics such as environmental health and safety, leadership, custodial training, developmental training, facilities renewal and asset management, and more. For more information, visit APPA's Web site at [www.appa.org](http://www.appa.org), or contact Kathy

Smith at 703-684-1446 ext. 231, or by e-mail at [ksmith@appa.org](mailto:ksmith@appa.org).

If none of these topics meet your needs, just let the APPA office know what you are looking for and they will find a speaker for you. As members, we have been asking APPA to provide its educational programs in a less-expensive format. This is it! Low tuition and minimal travel costs, combined with a face-to-face educational experience, is exactly what we've been waiting for. Please take advantage of this new program and host a seminar in your region.

As you can see, the Educational Programs Committee and APPA staff have a number of "irons in the fire." It is an ambitious schedule, but with the army of outstanding dedicated volunteers and staff I know that we will succeed. As always, I look forward to hearing from any of you with input for our programs. Please don't hesitate to contact me by e-mail at [glreyno@iastate.edu](mailto:glreyno@iastate.edu). ☛



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## CAMPUS ECOLOGY COMES TO BUFFALO

by Walter Simpson  
Energy Officer  
SUNY at Buffalo

ON October 18 and 19, the State University of New York at Buffalo (UB) was host to the "Buffalo Green Campus Workshop," an interactive conference which focused on campus environmental responsibility.

The keynote talk was given by Julian Keniry, author of *Ecodemia: Campus Environmental Stewardship at the Turn of the 21st Century* and national coordinator for the Campus Ecology Program of the National

Wildlife Federation. Keniry gave numerous examples of progress in the greening of campuses nationwide.

Keniry's remarks were followed by two responses. First, UB Associate Vice President Ronald Naylor discussed the pursuit of the green campus ideal in light of competing campus priorities. The second response was given by UB Chemistry Professor and Environmental Task Force Chair Joseph Gardella, who spoke about broadening the scope of campus ecology work to include outreach into the community and public service.

In addition, workshops were held to discuss campus energy conservation, hazardous waste reduction, and back-to-nature, low maintenance campus land use practices. Kevin Lyons from Rutgers University presented green purchasing and contract writing methods. Alexandra McNitt described cost-saving dining service projects she implemented at Harvard University. Gary Nower discussed the University of Toronto's recycling program, which is diverting 60 percent of its solid waste stream. David Lieb explained how Cornell University has been successful in promoting carpooling and other transportation alternatives.

The second day of the workshop focused on student involvement in campus environmentalism.

The conference was attended by 90 representatives from colleges in the Western New York region, including Niagara University, SUNY Fredonia, Rochester Institute of Technology, University of Rochester, Ithaca College, Edinboro College, and UB. Cosponsors included APPA, Occidental Chemical Corporation, and the Campus Ecology Program of the National Wildlife Federation.

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### EXHIBITS

For the second year, this conference will offer 16 table top exhibits. This is a great opportunity for the college and university attendees to speak with current and potential suppliers.



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For more information or assistance with green campus activities, contact the Campus Ecology Program. Julian Keniry can be reached at 703-790-4322. *Ecodemia* is available from APPA; for more information, contact Cotrenia Aytch at 703-684-1446 ext. 235, or by e-mail at [cotrenia@appa.org](mailto:cotrenia@appa.org).

## APPA Office Undergoes Realignment

As we announced last year, the APPA Board of Directors voted to

reduce resources allocated to the government relations program. This action resulted in the elimination of a full-time staff position. In the meantime, APPA reduced staff in the Education Department and in Administrative Services. Therefore, the APPA office has downsized from 17 to 14 staff members within a period of one year.

Recently, APPA has further assessed its program needs and staff resources. This has resulted in several staff reassignments and an organizational restructure. The current

APPA staff is listed below and will be highlighted on APPANet. An \* indicates a recent change in title or responsibility.

**Wayne Leroy**, Executive Vice President

**Lander Medlin**, Associate Vice President

**Cotrenia Aytch**, Communication Services Manager

**Chong-Hie Choi**, Director of Budget & Fiscal Planning

\***Alycia Eck**, Communications & Marketing Assistant

\***Melissa Gingery**, Office Manager

**Steve Glazner**, Director of Communications

**Andria Krug**, Meetings & Conference Manager

\***Stephanie Legett**, Accounting Assistant & Accounts Receivable Manager

\***Maxine Mauldin**, Member Services Manager

\***Tina Myers**, Director of Member Services

\***Medea Ranck**, Director of Marketing & Outreach

**Kathy Smith**, Director of Education

\***Diana Tringali**, Director of Research & Development

These reductions in staff, realignment of duties and responsibilities, and the continuous streamlining of internal operations are being done to maximize APPA's limited resources. As always, APPA staff is committed to meet your needs. ☛

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### Correction

In the "Multi-Skill Training" article in the July 1996 issue, the company whose course materials were used in classroom training was identified incorrectly on page 41. The course material—tests, instructor guides, etc.—was purchased from Schoolcraft Publishing. They can be reached at 800-837-1255, or by e-mail at [training@schlcraft.com](mailto:training@schlcraft.com).

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by Wayne E. Leroy, CAE

**A FEW** years ago when the idea was conceived for this Executive Summary column, we envisioned conveying thoughts and ideas that would encourage readers to "look outside the box"—to search for answers and solutions beyond the routine, traditional, and perhaps previously used methodologies.

This issue on energy and utilities certainly provides readers with the opportunity for looking for solutions in new and different ways. To help focus on the importance of facilities and the role of energy and utilities, the following statistics may be illustrative:

- ▼ Facilities and institutional infrastructure on college and university campuses is a \$500 billion investment
- ▼ Annual expenditures for higher education maintenance, operations, and construction is \$17.5 billion
- ▼ Higher education facilities touches the daily lives of over 17 million students, faculty, and staff
- ▼ Energy and purchased utilities amounts to \$6.5 billion per year; for most institutions this equates to a range of 35 to 50 percent of their total operations and maintenance budgets.

(Note: these statistics are for only the United States of America.)

In keeping with the theme of energy and utilities for this issue of *Facilities Manager*, currently there are several "windows of opportunity"

Wayne Leroy is APPA's executive vice president. He can be reached at [leroy@appa.org](mailto:leroy@appa.org).

that education institutions can avail themselves to.

### 1. Changing Utility

**Industry**—The electric power industry, as with other regulated industries such as natural gas and long distance telephone service, is in the midst of becoming a deregulated industry. With deregulation comes a period of confusion, consternation, and opportunity.

Educational institutions should embark immediately, if they have not already done so, on developing a strategic long-range plan. One of the components of this planning process must be an energy and utility strategy. This strategy must assess both current and anticipated energy budgets. This assessment will confirm that the institutions energy expenditure is indeed a significant amount. This energy expenditure, however, can be viewed as an institutional asset. This large expenditure provides negotiating leverage to create a better purchasing position, or to create partnership opportunities for the benefit of both the institution as well as the utility service provider. However, planning for future action should begin immediately, or opportunity may pass you by!

### 2. Deferred Maintenance—

Accumulated deferred maintenance is nothing new to any facilities manager. The recent APPA/NACUBO/ Sallie Mae report,



*A Foundation to Uphold*, identified a backlog of \$26 billion. This amount could be as high as \$32 billion if all infrastructure is included. The current research report was intended to be a benchmark against the 1989 *Decaying American Campus* report on deferred maintenance. The results are as we might have anticipated—the condition has worsened! But, there are some bright spots, some shining examples of hope. Almost 40 percent of the responding institutions indicated that their deferred maintenance had *decreased*. What were the reasons for this decline? According to the survey, four items were significant



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factors in reducing the amount of deferred maintenance.

- A. First and foremost was the fact that in all institutions where deferred maintenance had been reduced, the overriding reason was strategic planning. In those institutions, facilities had been incorporated into overall strategic planning of the institution. A realization had occurred that an institution cannot attain its mission of providing quality teaching, research, or public service without having quality facilities.
- B. Increased or specific funding for deferred maintenance was another significant factor for many institutions having reduced their levels of deferred maintenance from 1988 to 1995.
- C. Institutional budget priorities at many institutions were modified to reflect the importance of facilities. These priorities were the common thinking of the campus community and included student needs for a learning environment, faculty to accommodate an effective teaching atmosphere, and staff for a healthy and safe workplace.
- D. Delay of new or additional construction that provided time for assessment of current facilities as well as utilization of current space also was a significant factor in the education of deferred maintenance.

So, when developing the comprehensive facilities plan, there may be opportunities to eliminate some of the deferred maintenance backlog by incorporating into the process a holistic energy approach and creating ways to leverage current expenditures or create unique partnerships that will provide much needed capital investment

in institutional facilities and their supporting infrastructure.

3. **Financial Resources**—This fall APPA, with support from the U. S. Department of Energy's Rebuild America initiative, conducted a series of pilot workshops. The purpose of the workshops were two-fold:
  - A. To develop a business strategic planning process that could utilize a series of integrated solutions allowing the leveraging of energy and utility budgets to enable capital investment in facilities and infrastructure.
  - B. To have workshop participants assist in determining what the greatest needs as well as opportunities exist for institutions in the areas of energy and utilities in the next few years.

Whether it was good planning or just luck, the various efforts that affect the facilities areas of energy and utilities are now beginning to merge, blend, and support appropriate solutions. The recent deferred maintenance study indicates that reductions can occur through a comprehensive planning process. Perhaps now is the time to incorporate into that planning process a comprehensive strategy for energy and utilities. The recent Opportunity Assessment workshops and the results of *A Foundation to Uphold* confirmed there are available financial resources from institutional sources, commercial monetary establishments, or through some of the emerging partnerships that focus on productivity and performance.

Now, more than ever before, is the time to think outside the box when it comes to energy and utilities. So, be innovative and creative—the solutions are out there. It just takes starting to look at all the pieces of the puzzle to be able to see the entire picture. ■



# Focus on Management

## Is It Worth the Energy?

by H. Val Peterson

**IF YOUR** experience was anything like mine, you probably had a grandmother who exhibited great frugality and domestic invention. She could rub two drumsticks together and come up with an entire chicken, or at least a stew that turned a lot of leftovers into a nutritional delight. Meanwhile, out in the shed, Grandpa was straightening bent nails, using wood scraps to create some useful object, or tinkering with the can opener that didn't quite work right.

Somehow over the last two generations, we have made a 180-degree turn in our attitudes about waste. From the frontier, old world, want-not work ethic, we have emerged as a society that accepts waste not only as a matter of course, but as a sound economic principle. We have become a throwaway society, recycling programs notwithstanding. We have disposable razors, diapers, cigarette lighters, paper cups, plastic bottles, and the list goes on.

However, the list of disposables is not limited to small items. Some developers construct buildings and even major complexes with planned obsolescence in mind. Instead of building facilities that will last for centuries, they build for a twenty-year life and then plan to tear them down and construct something else. Technology moves so fast these days that it is more cost efficient to throw away electronic equipment, such as computers, rather than upgrade or fix them.

*Val Peterson is director of facilities management at Arizona State University, Tempe, Arizona, and a past APPA President. He can be reached at [valpeterson@asu.edu](mailto:valpeterson@asu.edu).*

While this trend is more prevalent in some countries than others, for those that grew as rapidly as did the United States, I suppose waste was bound to happen. For example, in a period of just 200 years, the United States population grew from 4 million to 215 million. Things were really booming and people had become extremely complacent about waste until the energy crisis came along in the 1970s. The shortage of energy created a whole new era of "shortages" and we were forced not only to reduce wasteful habits, but to turn waste itself into a usable commodity. But even this has been slow in coming.

Some of the positive results of this have benefited us all. In the old days, when your transportation gave out, the buzzards and Mother Nature took care of the disposal problem. Yesterday's "old paint" usually ended up in some unsightly junkyard or became a blight on the landscape elsewhere. The energy crisis gave rise to the need for scrap aluminum, copper, zinc, and other metals that we previously threw away. Thus, recycling occurred. A few years back it was noted that the 146 automobile shredding machines in the country produced over one million tons of "reject" non-ferrous metals each year.

Since we are a highly mobile society, it's not surprising that the automobile is the most widely used major appliance and that most households have more than one. As a consequence, we go through two or three sets of tires during each love affair with a particular vehicle. And what happens to these old casings? Disposing of them is a real problem—you bury them and they

work their way back to the surface. Try to sink them in water, and they float. Burn them, and you're in

trouble with the environmental protection folks, not to mention your neighbor. Throw them away behind the garage and you've created an attractive home for rats and mosquitoes. The fuel shortage has allowed old casing to be recycled as raw material for new tires or recapped tires, fuel for specially built boilers, and several other creative uses.

So what does all this rambling have to do with each of us? It's simply this—we live in a world of declining resources. Shortages of resources will continue, especially as the world population grows. If we are to maintain current lifestyles without unalterably damaging our world, it is the responsibility of each of us to do our part to eliminate waste. There are major opportunities within the facilities management profession to do this through efficient utility operations, energy conservation, recycling, and the efficient use of human resources. Waste and recycling are a matter of attitude. Each of us can do our part as members of the community in which we live, at work or at home, to minimize waste and recycle where feasible. The world and your community will be a better place if you actively contribute toward the reduction of waste and participate in recycling activities. ♻





# Strategically Planning

## Shaping Your Organization's Destiny

by James O. Cole & Susan D. Cole

**MOST** people in organizations, especially those in management and leadership roles, are aware of strategic planning. Mission and vision statements, as well as principles, are increasingly being displayed in public areas. Managers talk, usually with pride, about their organization's strategic plan. While most organizations view having a strategic plan as a desirable objective, there remains great confusion about how to go about creating one.

What is a strategic plan exactly? What alternative models are there to follow, and how do they differ? How does one actually go about preparing for, crafting, and implementing a strategic plan? Who should participate? How do we begin, and how do we know if we are on the right track at any particular point in the process?

In this and the next five issues of *Facilities Manager*, we will discuss strategic planning and address many of the typical questions that arise once a decision has been made to pursue this opportunity. We will present some of the models that are in use, including a brief discussion of Professor Peter Drucker's *Theory of Business*, which provides some valuable insights regarding how an organization must view its situation and the environment in which it exists.

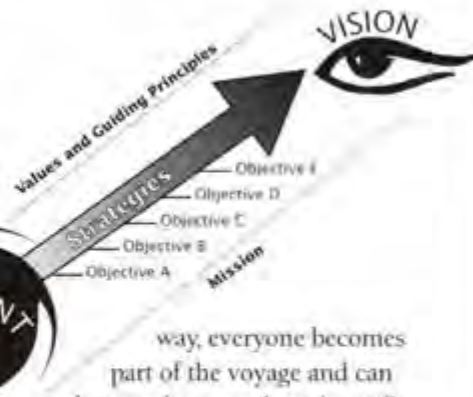
**James Cole is the principal consultant to management, and Susan Cole is president, of CommTech Transformations, Inc., based in Fort Collins, Colorado. James is a 1996 recipient of APPA's President's Award for assisting the APPA Board of Directors in the development of its strategic plan. The authors can be reached at [jocole14@aol.com](mailto:jocole14@aol.com).**

We'll also look at how to prepare your organization for strategic planning, including different approaches to participation, the actual process for crafting a plan, and how to organize for implementation, measure progress, and assure success. The final article of the series will address how to keep the energy going—how a strategic plan can become a living and vital element of organizational culture.

Strategic planning is really about making a conscious and proactive effort to shape the destiny of an organization. Realistically, either you have a hand in designing your future, or your future will be predominantly determined for you by external forces, which often exist in conjunction with a lack of cohesion and focus within your organization.

The activity of strategic planning can be compared with the effort involved in organizing a complex family travel vacation. First, you decide where you want to go and how long you have for the journey. You examine possible destinations and set some major goals, usually represented by key sites or people to visit. Then you brainstorm possible routes (strategies) through which you will reach each of the goals. These strategies become your map or your plan of action.

You may set subgoals, including intermediate destinations to be reached at specific periods in time. You may choose from various modes of transportation. These choices represent your tactics—how to get from point to point, perhaps not even involving a key destination or goal, but only being a step (or a diversion) along the way. Finally, you organize your participants to take responsibility for each aspect of the journey. In this



way, everyone becomes part of the voyage and can share in the rewards and gratification when the destinations are reached.

Periodically, as in vacations, the "map" should be revisited to ensure that you are still on course and making desired progress. Occasionally, events occur that cause you to change your vacation route, and perhaps even some of your destinations. Similarly, it is not unusual for organizations to adjust their expectations or objectives, based on experience and progress encountered as the strategic plan's execution evolves.

Imagine how risky it would be to simply start traveling without knowing your destination, or without having a road map. In today's highly competitive and demanding environment, organizational journeys are fraught with great uncertainty and risk—because the choice of destinations and routes is so complex and often the both are interlinked with dynamic external factors that are not entirely under one's influence.

In the beginning, if the strategic planning effort is to be as introspective as possible, an organization needs to stand back and look at itself objectively. What is it all about? What is the "theory of the business," and does the current theory match reality?

Once the organization establishes its mission (the overarching purpose of the organization—a clear statement as to why the organization exists), and its



values and guiding principles (the enduring beliefs and guidelines for behavior, which reflect the management system of the organization), these can serve as a framework within which the strategic plan can be developed. The vision of the organization (a clear picture of the desired future state) becomes the target; the ultimate destination or overriding goal.

The strategies, objectives, tactics, and vision of the strategic plan must be contained within the boundaries established by the mission, values, and guiding principles. The strategies are defined as the broad programs or master projects that will achieve the necessary results (goals) within the planning time frame. The objectives are specific, quantifiable results to be accomplished, which will lead to the vision becoming a reality. The tactics are the assignable task components of the strategies—the multiple, smaller-scope activities that can be readily understood and measured. The tactics allow for multiple successes and provide the opportunity for celebration and reinforcement.

During each year of the planning time frame, specific elements of the strategic objectives must be identified for achievement. Satisfying the objectives becomes a more attainable task when they are broken down into subgoals, each with a target time for completion. And it is against these subgoals that tactics are applied. This detail level planning guides the allocation of resources necessary for success in each step of the implementation process.

Thus, strategic planning provides a sure-footed approach to the future, with the added advantage of instilling employee confidence in the ultimate direction of the organization. The organization's people, those who are so key to the success of the organization, along with the larger organization itself, will benefit greatly from having a plan at all, let alone a coherent one. Perceived aimlessness within an orga-

nization translates to morale problems among the employees because it converts into a belief that the future is uncertain, unpredictable, and uncontrollable. Uncertainty is invariably a threat in the minds of employees, with productivity often adversely affected.

It seems obvious that having a strategic plan is desirable, but it is also vital to recognize some potential difficulties. Strategic planning is not the panacea for all the challenges an organization faces, nor is it easy to "stay the course" once that course has been determined.

For example, although most people agree that a *long-range* plan is important, they are conditioned to think and react to the short term. In our results-oriented culture, patience is a rare commodity. Additionally, when unforeseen problems occur, returning to what has always been done feels safer. For management to refocus, to think and react strategically with long-range goals in view, requires time and persistence. When performance is measured on a quarterly, or even an annual, basis, there is a natural tendency to concentrate on the current time frame rather than some hoped for and vague future benefit. Further, getting full and effective participation and input from throughout the organization is challenging.

Cultural change and change in the belief system are extraordinarily difficult to achieve. A critical factor in creating and maintaining an active and vital strategic plan is the belief that it is the right thing to do. Finally, it must be an evolving and dynamic road map, not just a lot of great ideas that wind up gathering dust on a shelf.

In spite of the challenges, developing a strategic plan is worth the effort, and certainly worth the effort to do it right. Ideally, the strategic plan is a dynamic vehicle that can be responsive to change and still be viable. Revisiting the plan, and integrating changes in the plan—as circumstances

and the environment change—is imperative, and is inherently a part of the overall strategic effort. Also, measurement systems must be developed and applied in order to help you be able to evaluate how you are doing and generate the best chances of success.

APPA's Board of Directors undertook a significant strategic planning effort during the presidential tenure of Doug Christensen last year. The need was clear: the nature of the academic environment is dramatically changing, and therefore so are the demands and expectations relative to the management of facilities. The needs of APPA's membership, and its various organizational units, are changing as well. If APPA is to provide the national and international leadership required to continue to support and strengthen facilities organizations, the central organization itself must be "on the cutting edge."

As a result, the Board recognized that a picture of APPA's future was desirable, and that a strategic plan was required so that the direction and momentum developed during one year was not lost with Board membership changes each July. Thus, APPA saw the need to attempt to develop an organization-wide strategic plan in a far-flung organization consisting of many independent units and people with diverse views and ideas. It was an ambitious goal with rewarding results. The new APPA Strategic Plan was presented to the membership at the July 1996 annual meeting in Salt Lake City, Utah.

In the next issue, we'll discuss some strategic planning models and how to apply them, and we'll also look at some examples. There is no one model that is applicable for all organizations, so we'll discuss how to design an appropriate model to meet your specific needs. We look forward to sharing our knowledge of and experiences with strategic planning with you throughout 1997. ☛



**ENERGY** users, including colleges and universities, are primarily interested in energy conservation and efficiency as a means of saving money. But of greater significance is the fact that conservation and efficiency mitigate numerous adverse environmental and social impacts associated with energy production and consumption. These impacts include air pollution, acid rain and global warming, oil spills and water pollution, degradation of land and loss of wilderness areas, construction of costly and sometimes dangerous new power plants, and the risk of international conflict and war over energy supplies.

How ironic it is, then, that as the urgency of conservation and efficiency increases, energy policy may be taking a giant step backwards as the electric industry is deregulated or restructured. I say this because in many parts of the country the deregulation debate appears to be focused almost entirely on the price of energy, without a adequate concern for energy's true costs.

College and university facilities managers will find lower energy prices irresistible. After all, it's been our job to cut energy costs, and obtaining lower prices is one way to do that. But success in that endeavor will inevitably mean reduced incentives for conservation and increased energy use. And we all know that's the wrong way to go.

*Walter Simpson is energy officer for the State University of New York at Buffalo. These are his own personal views. He can be reached at [enconser@ubvms.cc.buffalo.edu](mailto:enconser@ubvms.cc.buffalo.edu).*

### Buying at the Margin

The brave new world of the restructured electric industry may allow colleges and universities to buy power at "declining block rates" or "at the margin"—from a third party producer (through retail wheeling) or from a local utility (through a custom contract designed to discourage the consumer from buying from a distant supplier). These rates could destroy a campus' energy conservation program.

Imagine a rate structure that provides a marginal rate (say \$.04/kWh) which is one-half of the average rate paid for all electricity (say \$.08/kWh). Under this scenario, the cost of the next kilowatt hour used or saved is discounted. Since conservation occurs at the margin, discounted marginal rates undermine the incentive to conserve. Low marginal rates reduce the dollar savings of prospective energy conservation measures, increasing payback and the likelihood that these projects will not be undertaken.

Of course, facilities managers with cogeneration plants face the same economic reality. Once their cogen plant is up and running, it may cost very little to produce the next kilowatt hour of power. Under those circumstances, the economic value of the next "megawatt" (or kWh saved) is equally small. Say goodbye to decent paybacks for energy efficiency projects. When the next kWh is cheap, say goodbye to conservation.

### What to Do?

It's a given that colleges and universities are going to take advantage of lower energy prices. But how can they do that and still maintain programs that actively save energy? Here are some possibilities:

- ▼ **Use life cycle cost/benefit analysis to evaluate energy conservation projects.** This is a more realistic way to evaluate projects than simple payback and will demonstrate the value of doing longer payback projects.
- ▼ **If negotiating a custom contract with your utility, demand a rate structure that does not undermine incentives for conservation.** This can be done by avoiding marginal rates altogether, a costly approach if your campus is growing, or by incorporating a baseline adjustment mechanism that permits documented energy savings to accrue at the full or average rate rather than at a marginal rate.
- ▼ **Find an energy supplier that can provide energy services, not just electricity.** Nationwide, electric utilities and energy service companies (ESCOs) are now exploring ways to team up to deliver electrical and energy efficiency services. Innovative contracts should be possible soon. These kinds of contracts also may be possible for natural gas, heating and cooling services, etc.
- ▼ **Be careful about the duration of energy contracts.** This is a time of great change and uncertainty for the electric industry. It is difficult



to foresee rate and contract opportunities a year from now, let alone further down the pike. Shorter duration contracts will keep your options open and reduce the chances of getting locked into a contract that may not look so good a few years from now. But longer term contracts may be necessary for arrangements involving energy services; risk can be reduced by indexing maximum pricing to some competitive source.

▼ **Think twice about confidential contracts.** While energy providers may want confidential contracts (to give them a competitive edge with other prospective customers), college and universities have a special responsibility for public accountability that cannot be met if energy contract data is secret. Public institutions have an obligation to keep all energy information on the public record.

### ▼ **Design and build for maximum efficiency in the first place.**

Always a good idea, this is even more important now because restructuring may introduce electric rates that will make it a lot harder to justify retrofit projects, at least in the near future.

### **Joining the Debate**

This is not just about saving our own skins or programs. We have off-campus responsibilities as well. Accordingly, I recommend that colleges and universities, and their energy and environmental experts, get involved in the public debate over electric utility restructuring. As institutions of higher learning, we should take the high road and help guide restructuring in the direction of long-term public interest.

Restructuring will better serve the public if mechanisms are established to prevent unfair cost shifting among

customer classes, provide continued funding for energy efficiency and low income customers in need, block increased reliance on more polluting energy technologies (i.e., coal and oil), and guarantee the continued development of clean renewable energy sources.

New York and other states are exploring a "systems benefit charge" that would cost a fraction of a cent per kWh and be assessed on all delivered electricity, irrespective of generating source. This charge would create a fund to finance efficiency, low-income relief, and other "social goods." California is among the states likely to require that all energy providers have a minimum amount of renewable energy in their "portfolio." These are the kinds of proposals we need to support to ensure that restructuring doesn't cause more harm than good. ☐

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# POWER BUYING

## PLANNING FOR YOUR DEREGULATED FUTURE

by Wayne K. Robertson, P.E.

*"The times they are a-changing,"*

Bob Dylan, 1964

The last regulated major industry in America, the electric utility industry, is greeting competition in the very near future. Similar to the events that occurred in the gas industry a few years ago, it may soon be possible for facilities managers in many states to choose their suppliers of electricity. Some experts predict that this will be the biggest event to affect the industry since the Arab Oil Embargo of 1973.

The expected benefit of deregulation is reduced costs for power, by 20 to 30 percent or more, especially for customers now paying higher than average rates and customers with large loads or the ability to aggregate loads. However, benefits will vary with location and by customer class—institutional, commercial, residential, industrial. How can you ensure that your institution benefits the most from this opportunity? What should you do and not do?

Deregulation offers building owners more options for saving energy and money in their facilities than ever before. In addition to "demand side" energy conservation retrofit projects such as new energy-efficient lights, chillers, and boilers, owners will soon have "supply side" options to buy electricity in a market that will become leaner and more competitive.

Can your institution benefit? Absolutely. Colleges and universities are desirable customers for electric utilities. For example, large campuses are like small towns—a population of 20,000, 200 buildings on 1,500 acres, and infrastructure owned by the university in most cases. With a year-round electric load, a state university can easily be one of the largest customers in a rural area. Unlike a town of 20,000 individuals, however, a university is under unified management; therefore, you can make large purchas-

ing and infrastructure decisions that can have an impact on a utility, positively or negatively.

Many gas utilities view the turmoil in the electric industry as an opportunity. They are also competing for your new business in new ways. Electric and gas utilities have seen deregulation coming and are girding themselves to be more competitive in the environment of the future. Utilities, both gas and electric, are striving to strengthen customer relations and pursue long-term contracts with large customers such as colleges and universities. The result: it creates opportunities for you to aggressively negotiate agreements, implement changes to your physical plant to make yourself a more attractive customer, and explore new energy supply options and alternatives that promise to lower your fuel and power costs permanently.

### BACKGROUND

For more than 100 years, utilities have operated as monopolies, many having a designated block of customers, or territories under state laws. The cost of electricity was generally set by public utility commissions. But now, recent events have unlatched the door to a deregulated environment and retail competition. Retail wheeling will allow your local utility to deliver or "wheel" power to you that may have been generated by someone else. The benefit: you get an opportunity to "shop" for the lowest priced electricity as you now do for long distance phone services.

There is a lot of guesswork about how fast competition will come and what its effects will be on both customers and the electric industry. But most experts agree, it will happen. As the door to retail competition opens, look for change, creativity, confusion, and above all... *customer choice and opportunity.*

### LEGISLATION

Currently, more than forty states are evaluating or exploring retail wheeling, and are setting up internal groups to assess the implications of retail wheeling and recommend possible industry structures.

*Wayne Robertson is director of energy consulting at Heery International, Atlanta, Georgia. He chairs ASHRAE's Technical Committee on Owning and Operating Costs and is a board member of the Southeastern Energy Society.*



California, Michigan, Ohio, Illinois, New York, and New England are leading the way in utility deregulation. Not surprisingly, California is proposing the most innovative plans to date. In August 1996, California legislators approved a far-reaching plan that would open the state's massive electricity market to competition and lower consumer rates.

The complex legislation would deregulate the state electric power industry, while cutting consumer rates by at least 20 percent by 2002. The legislation will end the utility monopoly on generation, opening the market to competition so that retail customers could choose among electric energy suppliers as early as January 1998 and the control of the transmission lines would be consolidated under a new independent systems operator. The legislation also provides for a transition charge to be levied by utilities and recovery of stranded costs via a tariff.

Federal action is also possible. With 51 regulatory agencies governing 198 publicly-owned utilities, the pace and form of deregulation will vary from one jurisdiction to another unless the federal government steps in to establish uniform rules. House Bill 3790, for instance, would make states establish retail choice for power supplies. The legislation, long anticipated by electric industry and consumer groups, is setting a deadline of December 15, 2000 for all utilities to offer retail choice. Other bills are expected to be introduced in 1997.

#### Current Events

Some energy users are already realizing benefits even before deregulation arrives. Some energy users are signing agreements with large utilities in advance of deregulation. Such actions are not restricted only to the large customers. Institutions and companies can use a form of "aggregation," whereby small users unite, at least contractually, to become an attractive large account or customer for a competitive-minded utility. Individually, a single facility or store would not have much clout with a national utility, but combined they become a market force. The message: *opportunities are everywhere.*

Clemson University has completed a fuels procurement study considering long-term purchasing of both natural gas and electricity, coupled with the development of a program to reduce loads and increase energy efficiency through a better energy management system. Clemson's present fuel and power suppliers are negotiating aggressively with the university, because Clemson demonstrated its knowledge and awareness of the evolving situation in the industry and that it has alternate fuel supply options. As a result, the current utility companies are acting positively to strengthen their ties with this important and valued customer. Most colleges of similar or larger size have similar opportunities.



#### THE FUTURE FACE OF YOUR UTILITY

Competition will result in major changes in generation, transmission, and distribution of electricity. The utilities traditional vertical integration will change. The author expects that generation will be deregulated while transmission and distribution systems will be separately owned and remain regulated due to their monopolistic characteristics. From a functional standpoint, watch for the unbundling of the electric utilities systems. Generation will be "owned" by the Generation Company (GenCo), and Transmission Companies (TransCos) will transmit power to local Distribution Companies (LDCs or DistCos). DistCos will deliver this power to the customer and will likely be in charge of customer billing, including transmission and generation charges—similar to local telephone companies including long distance carrier charges.

Utilities are already being affected. As deregulation takes place, the three services offered by utilities—generation, transmission, and distribution—may likely be provided by three different companies. Some utilities are reading the writing on the wall and have already begun the "unbundling" process. They are internally dividing the utility into three separate entities. The following graphic shows the existing utility/customer system. The customer presently resides in the utility's territory which has an integrated generation, transmission, and distribution system.

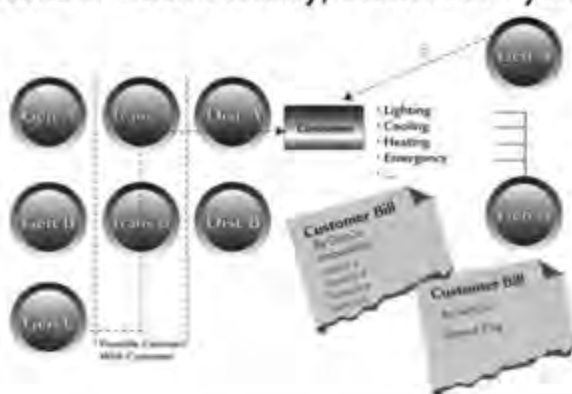
The following graphics show possible future scenarios. The utility services are unbundled, some owned by separate companies, and the customer has a choice of power suppliers (GenCos). The future system may be a combination of several scenarios.

#### UTILITY CHANGES ALREADY HAPPENING

Change is already manifesting itself with mergers and downsizings, new subsidiaries, and new images. During 1995, there was more merger activity than in many years—Baltimore Gas and Electric with Potomac Electric Power Co.; UtiliCorp with Kansas City Power and Light;



## Possible Future Utility/Customer System



Northern States Power with Wisconsin Energy, and even internationally with a U.S. utility acquiring a British entity.

Historically, utilities would be known as either ABC Edison or XYZ Power and Light. Now, we have Ameren, Centene, Cinergy, Entergy, Illinova, Primergy, Unicom, and UtiliCorp. Electric and gas utilities are forming unregulated subsidiaries by the scores, many with forward-looking names including EnergyOne, Ener-G-Vision, EnerShop, Evantage, Northwind, Power Smart, Power Source, and Sourcecom.

The following are changes to look for in the utility industry:

- **Downsizing and Lowering Costs:** Utilities are offering early retirement, implementing layoffs and hiring freezes in order to downsize and become more competitive.
- **Mergers and Acquisitions:** There were over thirty-five utility company mergers in 1995, which is unprecedented. Look for more mergers and acquisitions to continue as deregulation approaches.
- **Unbundling:** Some utilities have already begun to unbundle generation, transmission, and distribution; this practice will continue and pick up speed. For customers over a certain size, this has been happening for a while in the gas industry. However, the minimum threshold has been getting smaller and at least one gas company, Brooklyn Union, is allowing marketers to "aggregate" loads, even residential ones, to meet their minimums. Massachusetts Electric, Wisconsin Gas, and utilities in the State of Illinois may be the next to unbundle.
- **Customer Retention/Value Added Services:** Utilities are trying to improve customer relations and are offering special services in order to retain existing customers. Some utilities have put employees on the customer's site to handle energy and power-related problems. Realizing that the larger energy users are likely to shop for power in a deregulated environment, utilities are offering discounted rates for long-term contracts. New rates and incentives are being offered to larger customers. Look for these services to increase and continue.

- **"Crossing the Meter":** Utilities are offering, or will begin to offer, other value-added services as they seek new ways of serving customers. By owning and maintaining equipment such as chillers, boilers, generators, lighting, and even compressed air systems, the utility takes the "burden" of ownership and operation off of the customer's shoulders, allowing them to focus on their business. By selling these end-use services to the customer, the utility is in a strong position to retain the customer when retail access becomes a reality. Watch for further creativity by utilities as they pursue customer satisfaction and, thereby, customer retention.

- **"Branding":** Utilities are creating brand names for off-price power. Some utilities have changed names in order to appear more competitive and attractive to potential customers. This marketing effort helps the utility be perceived as a contemporary competitive corporation rather than that of a sluggish monopoly.
- **Decreasing Demand Side Management (DSM) programs:** Popular for years with colleges and universities, DSM programs may go away in the utility offerings of the future. Since 1993, there has been a drop-off of DSM programs. Utilities will most likely continue to offer DSM related services, but will combine these with services offered by Energy Service Companies (ESCOs). As subsidiaries or as affiliates, ESCOs are performance contracting firms that install energy conserving retrofits or energy production projects, e.g., cogeneration, at the ESCO's expense, and is repaid from the guaranteed savings that occur.
- **Improving and Utilizing New Technology:** Utilities are utilizing technology, such as electronic metering, to improve service and offer special rates. Several utilities are offering customers with multiple locations the ability to combine accounts electronically in order to improve billing and/or lower utility costs by totaling coincident demands. Improvements in technology will improve customer services, and thereby, positively affect retail wheeling. Many technologies will be improved upon and utilized in a deregulated environment. Researchers agree that many technologies developed for DSM programs may be beneficial to customers in the free market.

## CREATIVITY

Utilities have long been viewed as conservative traditional monopolies, reluctant to change or take risks. While some utilities will continue to avoid change and debate with commissions, savvy utilities hoping to compete, survive, and thrive in a deregulated environment are focus-



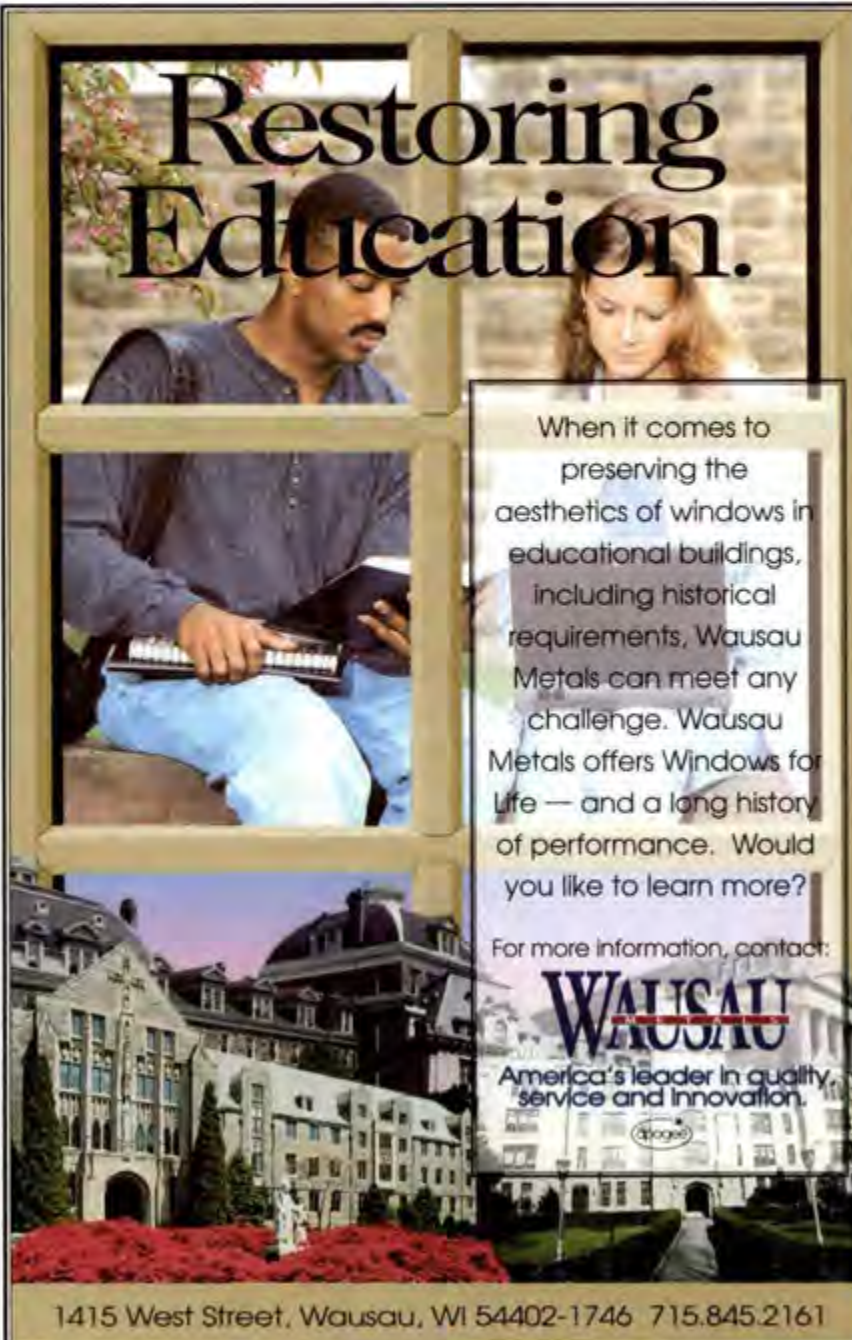
ing on strategic planning. It is important to recognize the following industry initiatives:

- **New Rates:** Look for further special offerings. Examples of creative rate structures include realtime pricing, interruptible rates, and account totalization. Customers will be further presented with options for time-of-day, time-of-week, and seasonal rates. Spot pricing and longer term contract rates will continue to evolve and be offered to customers.
- **Creative Packaging:** Look for different companies to "package" power. Where customers presently purchase electricity and convert it to a resource such as cooling, heating, and lighting, companies in the future may locate "service facilities" on a customer's site and sell end uses to the customer. For example, a facility containing generating equipment, chillers, boilers, phone equipment, thermal energy storage, and energy management systems may be constructed for a customer. Next, the customer would purchase chilled water, power, peak shaving, etc., from the "service facility," which would provide services and maintain all equipment.
- **Multiple Rates and Contracts:** Look for GenCos, TransCos, and DistCos to offer different energy purchase "packages." Customers will likely be able to purchase both off-price energy on the spot market as well as higher priced energy through long-term contracts.
- **Cogenerator Activity:** Look for nearby cogenerators, or potential cogenerators, to seek nearby customers for power sales. These companies, along with marketers, will create a variety of ways this "power" or service may be sold.
- **Negotiations With PUCs:** Utilities have a strong voice in public utility commission proceedings. Look for utilities to propose alternative ideas and compromises to the deregulation proposals developed by state commissions.

## CONFUSION

Increased customer options, varying state laws, regulations, timelines, and activities, increased marketing by competing firms, varying results of other deregulated industries, and utility restructuring will lead to customer confusion.

- **Marketing Strategies:** As competition increases, there will be more firms marketing to customers, each with a reason as to why they should be the provider of choice. Customers will likely need to employ the assistance of third-party consultants to evaluate their best options under applicable law and evolving deregulation.
- **Past Deregulation:** Industry deregulation has resulted in varying degrees of customer benefit and/or cost. For example, deregulation of the electric industry in the United Kingdom resulted in increased utility rates for customers, while deregulation in Norway resulted in a rate decrease. There will be much debate as to how rates in the United States will be affected, even as competition takes place.



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- **Utility Restructuring:** With the new services, reorganization, new alliances, and new names offered by utilities, customers will find it difficult to distinguish between ESCOs and utilities.
- **Litigation:** Several proceedings at the federal level involve such general questions as who is entitled to wholesale wheeling and under what conditions. Similar actions may be expected on the state level with respect to retail wheeling.

## CUSTOMER CHOICE AND OPPORTUNITIES

Due to the high state of changes occurring in the electric utility industry, utilities are now trying to strengthen ties with customers and would like to sign long-term contracts with customers including colleges and universities.

Having long been held captive by territorial acts, most customers are resigned to purchase electricity from one supplier, with no thought of negotiating rates. While smaller energy users may still be in this frame of mind, large industrial and commercial users are putting pressure on utilities to offer lower rates and are pushing legislature and utility commissions to rapidly allow them to shop for power suppliers, or wheel power at the retail level. Utilities realize the reality of deregulation, and are coming to the bargaining table, particularly if they think you have options, which you do.

Following are unique or special opportunities that colleges and universities should consider:

- on-site generation
- central utilities plants including privatization by utility companies

- municipalization
- aggregation
- alternate fuels
- combining meters, either physically or electronically.

It should be noted that certain of these "opportunities," e.g., privatization and "municipalization," may have unexpected ramifications if, for example, such an opportunity results in regulation of the college or university as a "public utility" under applicable law.

In a deregulated environment, large energy users are likely to purchase unbundled power and create tailored portfolios. Middle market customers will likely purchase a combination of unbundled and customized services from a variety of providers. Residential customers will likely purchase bundled services, much like they now do, but may be offered power from merchants who have addressed issues of residential customer service, meter aggregation, billing and collections, and load balancing.

## ACTIONS NOW

Most consumers could take no action and still benefit from deregulation when rates generally decline, but being proactive will deliver more savings, and sooner. Utilities are willing to negotiate with knowledgeable customers. The burden is on facility managers and consulting engineers to acquire the information and skills necessary to maximize opportunities. For the best energy deals in the future, consider the following tactical steps:

- **Build a Team:** Assemble all the staff who have a role in privatizing an institution's, company's, or governmental entity's utilities, including contracting personnel, engineering staff, real estate specialists, and legal representation. Consider using an outside deregulation consultant to handle surveys and review offers from utility companies.
- **Evaluate Facility Requirements:** Conduct an energy audit to assess energy efficiency of buildings, as well as identify cogeneration or required maintenance to become a more attractive privatization prospect for a utility.
- **Be Noticed By Your Utility:** Arrange meetings with your utility provider and explore new rate options and their future plans (e.g., Clemson University). Let utilities know that you are researching your options.
- **Seek Package Discounts and Rate Incentives:** Seek offers that utilities are exchanging for long-term commitments, but remain wary of discounts that require too long of a contract.
- **Be Involved in a Competitive Users Group:** There is strength in numbers. Primary industries that convert raw materials to products and use a lot of energy in the process will be the automatic winners in deregulation. But, joining with other mid-level users can give insight



into utility company strategies, affecting utility company policy in the short term and leading to more aggressive rates in the long term.

- **Aggressively Seek Rate Options:** Contact your local supplier, state commission, and area utilities. Solicit power proposals from non-host utilities.
- **Perform Cogeneration Study and Design:** Users pursuing this option must be prepared to follow through if the economics are attractive, because utility companies must believe that you are sincere. You must conduct a cogeneration study and, if advantageous, begin design. Once the utility is aware of the real possibility of losing load, they may increase their flexibility about special rates.
- **Evaluate Peak Shaving Generation and Gas Cooling Opportunities:** As with cogeneration, a formal analysis increases your bargaining position. Using a consultant to perform extensive studies makes you a knowledgeable consumer and gives you an advantage in negotiations.
- **Look for Local Cogeneration Projects:** New advances in combined cycle turbines have made generation affordable and efficient. In a deregulated environment, selling excess cogenerated power to neighboring facilities is an added bonus for facility managers considering cogeneration plants. Or, a local cogenerator may have excess capacity that they would like to sell to neighboring facilities when retail competition opens. Solicit proposals from these firms. Seek joint ventures with other large users nearby.

## STRATEGIC ENERGY PLANNING/STUDIES

Several different types of studies may be of benefit to facility owners and managers as they begin to explore a deregulated utility environment.

**Strategic Energy Planning**, the process of evaluating and selecting the primary fuel types for a new project, will gain new importance. Strategic Energy Planning, to be effective, must occur early in the pre-design phase. Rate Schedule Analysis will become very important because of its effect on long-term facility operating costs.

**Energy Master Planning**, the process of making choices about centralized versus distributed heating and cooling in campus-type situations, becomes more important for two reasons: the cost impact of alternate fuel choices and the opportunity to make your facility attractive to a utility provider. For example, on a multi-building campus, a large central cooling plant might attract a special rate concession from a utility provider when a dozen scattered chillers might not, especially if the central plant includes some other technologies that are important to the utility, such as the capability to peak shave during high demand periods.

(continued on page 28)

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(continued from p. 25)

This leads to a greater need in the future for *Peak Shaving Studies*, *Thermal Energy Storage Studies*, and *Cogeneration and Alternate Energy Feasibility Studies*.

In addition to studies, some general principles will help prepare facilities for deregulation:

- Install energy efficient retrofit projects
- Specify energy efficient new systems—chillers, boilers, lights, etc.
- Buy electricity wholesale if currently available; you may already be eligible under federal law, but consider the implications of such action under state law
- Evaluate alternate fuels frequently for new equipment choices; for example, evaluate gas-driven chillers vs. electric
- Avoid long-term contracts—you will lose too many options.

## TIMING

Many experts predict that some form of retail wheeling will be available to large customers in two to ten years, depending on their location. Once a state becomes aggressive in pursuing retail competition, a battle is waged between those for and against open access, and the process is delayed. It can be noted, however, that retail open access will become a reality after open transmission systems become a reality.

Two big issues are slowing down the process and concerns about raising costs for small customers, e.g., residential. Aggressive utility commissions and legislators are being told to "go slow" by internal forces who are uncertain of impacts, opponents of deregulation, and utilities. Two primary issues driving this "go slow" mentality are the uncertainty of customer and industry benefits, and time needed to recoup stranded costs by utilities.

Once examples of retail wheeling are shown to be successful, other states will probably follow. Regions with high electricity costs and large industrial bases will be driven to implement some form of transmission access more rapidly than others. Regions likely to lead the way are the West Coast, Upper Midwest, New England, and Mid-Atlantic states. Those states or regions with few utilities will have less debate, and will more likely have speedier implementation. Regions likely to follow are the Southeast, Southwest, Midwest, and Plains states.

## HOW WILL RATES BE AFFECTED?

There is much debate between industries, legislature, PUCs, and utilities as to how rates will be affected. Most experts agree that rates will come down as they did in the telecommunications, airlines, and natural gas industries.

Presently, electricity prices range anywhere from 2 to 16 cents per kWh, with the national average being 7 cents per kWh. Experts feel that the national average will be between 3 and 5 cents per kWh with deregulation.

However, the Federal Energy Regulatory Commission will most likely allow utilities to recoup some stranded investments by allowing them to place a transmission fee on transmission lines. This will put the cost of generation on the transmission grid. As a result, national averages will be higher than the anticipated 3 to 5 cents per kWh. Regardless, it is important to recognize that the impact on existing utility prices will depend on:

1. Stranded investment issues—how utilities and their stockholders will be compensated for their investment in power plants built under a regulated regime now that the plant is no longer cost effective or is "stranded" by customers leaving the system<sup>1</sup>
2. The customer class—i.e., large users equal low rates; small users equal higher rates
3. Existing utility rates
4. Geographic location and utilities serving the customer.

## SUMMARY

The utility industry is beginning its transformation to competitive environment. The process is creating once-in-a-generation opportunities for desirable customers such as colleges and universities to obtain new deals for lower priced electricity or other significant benefits and inducements from power producers. One university has performed all of the steps outlined in this article and is getting excellent results from their present fuel and power suppliers. The reason: the university has illustrated its knowledge and awareness of the industry's evolution and its own alternate fuel supply options. As a result, the present utility companies are acting positively to strengthen their ties with this important and valued customer.

Savvy facility managers should begin the steps necessary to take advantage of the opportunities presented by the promise of deregulation to lower fuel and power costs permanently. In this uncertain environment, knowledge is truly power. Commissioning strategic energy studies, rate schedule analyses, and energy master planning efforts are cost-effective tools for negotiating from a position of strength with utility companies. Such studies can deliver substantial operational savings on the bottom line. ■

### Note

1. Under the California legislation, for example, investor-owned utilities would be compensated for certain "stranded" costs, such as nuclear power plants, that would not be economical in a competitive market, through a system-wide competition transition charge. Under the proposed legislation, from January 1, 1998 to December 31, 2001, the transition charge would come to roughly one to two cents per kilowatt hour. The charge would help to raise more than \$26 billion to cover certain stranded costs.



# SAVING MONEY ON THE CAMPUS ELECTRIC BILL



by Paul Hoemann

Every institution of higher education spends a substantial portion of its facilities budget providing utility service to the campus. The challenge that facilities managers face is minimizing these costs so that adequate funds are available to achieve the institution's academic mission. At a typical university, 50 percent or more of the annual utility budget is for electricity. Targeting electricity for cost reductions makes sense: In many facilities operations, tremendous potential exists to reduce electricity usage and to cut electricity costs.

## Reducing electricity usage and costs through energy conservation

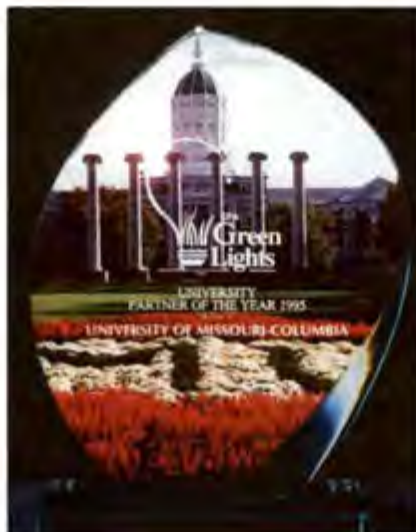
The University of Missouri-Columbia (MU) has aggressively pursued energy conservation projects to reduce electricity usage and costs. In just the last five years, MU's program has saved over \$2.7 million and reduced electric use by more than 15 percent. MU's energy conservation program includes the following elements:

- Establishing energy policies
- Establishing and maintaining energy standards
- Reviewing new construction and renovation design documents for compliance to energy standards and policies

*Paul Hoemann is director, energy management, at the University of Missouri-Columbia.*

- Installing meters so that meaningful measurements can be used to manage campus energy use
- Retrofitting existing lighting systems with energy-efficient systems where economically justified. (Evidence of MU's success in this effort was earning the distinguished EPA Green Lights Partner of the Year Award in the university category in March 1995.)
- Retrofitting existing building temperature control systems with energy-efficient direct digital control systems
- Upgrading and centralizing chilled water systems to energy-efficient systems.

A well-planned energy conservation strategy is important for long-term reductions in the campus energy bill. However, today's facilities managers also should be investigating opportunities on the national electric market to reduce costs through new purchased energy options. MU has undertaken an innovative initiative to reduce its electrical bill by purchasing "wholesale" electricity.



## Meeting MU's electrical needs: yesterday and today

MU has a legacy of electrical innovation that began with inventor Thomas Edison. In 1882, Edison developed a partnership with MU by donating one of his electric generators to the engineering school. Using the new generator, MU students and faculty created the first demonstration of incandescent lighting west of the Mississippi and later used the equip-





**MU's power plant.**

ment to light the university's main administration building, Academic Hall.

A coal-fired cogeneration power plant was built on the campus in 1892—signaling the beginning of an efficient utility supply. This original plant was replaced in 1922. The “new” plant was expanded several times and is now a 50-megawatt cogeneration plant producing economical steam and electricity for the campus.

Cogeneration involves producing electricity as a byproduct of supplying steam for heating, cooling, domestic hot water, and other process requirements. At MU, this byproduct electricity meets about 35 percent of campus electric needs. To supply the remaining 65 percent of electricity needs, MU has two choices: 1) purchase the electricity, or 2) generate the additional electricity with the same turbine generators needed for cogeneration and then use “condensers” to condense the steam not required by the campus.

For the last decade, MU has chosen to generate the additional electricity because the cost to generate power was lower than the cost to purchase it. However, over this same period of time, MU did explore opportunities to purchase low cost power. Certainly, if the university could find a low enough price, the electricity would not have to be generated in the condensing cycle at the MU power plant and

the overall efficiency of the power plant would increase. Most recently, during the late 1980s and early '90s, MU made “spot purchases” of electricity from the local utility. The drawback to these purchases was that pricing was not fixed and was usually higher than MU's incremental cost of generation. These spot purchases also were not available during periods of high demand.

### **The electric market begins to change**

In the past few years, MU watched as changes began to take place in the national electric market. Once again, MU was looking for new opportunities to receive lower pricing for purchased power—this time, from less-expensive utilities outside the local municipality. MU had an interesting advantage with its ability to generate all of its own electricity: The university could purchase low-cost interruptible electricity. If an interruption occurred, MU always had the backup of the full-capacity power plant.

### **Pioneering the new idea**

The first step in creating opportunities to purchase electricity from other utilities was to establish a contract to transmit it through the city's system to MU. MU began this process in 1991 when the university established a long-term electric service agreement with the local municipal utility, the City of Columbia Water & Light. Although the 1991 contract did not include a schedule for transmission service, MU began discussions at the time about adding such a schedule. A transmission schedule was finalized and added to the contract in November 1993.

With the transmission schedule in place, MU was ready to issue a request for proposals (RFP) in 1994 for the delivery of wholesale electricity to MU via the city. Wholesale electricity costs less because a power marketer or broker can bring power from various utility companies around the country—choosing the lowest cost suppliers at any point in time.



**An aerial view of the University of Missouri-Columbia.**

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Issuing an RFP of this nature was a new venture for MU and new for the electric industry as well. No other college or university had ever purchased electricity in this way. MU was aided in its search for respondents by a consultant, Scott Spiewak of Cogen Power Marketing, who has expertise in the marketing of electricity. Several power marketing firms expressed interest and submitted proposals in response to the RFP in early 1995.

### The first wholesale electricity contract

MU negotiated and signed a one-year contract with Enron Power Marketing, Inc. which began April 1, 1995. The contract was for the purchase of approximately 50 million kilowatt hours of interruptible electricity at a fixed price. Because the price was lower than MU's incremental cost to produce electricity in a condensing cycle, the one-year contract resulted in a savings of approximately \$200,000 in the campus electric bill.

The contract ran very smoothly. Even though the contract was for interruptible electricity, only one interruption of service occurred during the contract period. This interruption occurred during very hot weather in August 1995 and lasted twenty hours. MU was able to generate its own load during this time, and electric supply to the campus was unaffected.

### The second contract

Based on the success of the first contract, MU issued another RFP in December 1995 for the purchase of electricity and natural gas beginning April 1, 1996, when the contract with Enron expired. During 1995, MU had added a new gas/oil fired boiler to the power plant to serve as a backup and peaking unit. Because many electric marketers are also natural gas marketers, MU added the supply of gas to this RFP to see if a package deal (gas and electric) would offer any additional financial benefits. MU also has been evaluating the financial benefits of building its own natural gas pipeline. Local gas transportation costs could be dramatically reduced by connecting to a major interstate pipeline located only a few miles from the MU power plant.

Interest from utilities and gas and power marketers was very high, and MU received thirty-four responses to the second RFP with even better pricing proposals than the previous year. After pioneering this process in 1995 and "proving" that it could be done, MU captured the interest of many marketers who were skeptical the previous year and unwilling to put in the time and effort of preparing a proposal.

Of the thirty-four proposals, the offer from Koch Power Services, Incorporated (KPSI) promised MU the greatest potential for savings. MU signed a contract with KPSI that went into effect on April 1, 1996 for the purchase of approximately 48,000 MWH. Savings from this contract

will be approximately \$400,000, double that of the previous year's contract. The KPSI contract provides fixed pricing for hourly purchases of power scheduled on a weekly basis.

MU also signed a contract with Koch Energy Trading, Inc. for the purchase of natural gas at indexed based pricing. This has cut the campus natural gas bill by 25 percent. The MU power plant can burn coal, natural gas, or alternate fuels such as chipped tires as fuel for steam and electric generation. The price of natural gas under the contract with Koch Energy Trading is compared daily to that of other fuel sources to determine the lowest cost energy supply option.

### The future of wholesale power purchases

MU is now in the process of issuing a third RFP for the purchase of electricity and natural gas for 1997. The number of companies entering the power marketing business is increasing monthly, and MU expects to receive even more proposals than in 1995.

The success of this venture was made possible by staying informed of a changing market and aggressively pursuing the opportunity even though there was risk of failure. The electric industry continues to undergo rapid change which will offer new opportunities for cutting the campus energy bill. Retail wheeling of electricity is being experimented with in many states and will eventually become a widespread practice.

Facilities managers who hope to achieve minimum cost for utility supply to their campuses will need to stay aware of the changes in federal and state regulations that may have an impact on their facility and evaluate new options as they develop.

It is important that facilities managers maintain an open dialogue with their campus electric suppliers about various options for lowering the cost of energy. Simply because the university has other options, the local supplier may be willing to offer lower rates. It is safe to say that competition in the electric industry will change the way many campuses purchase energy in the very near future. ☐



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# THE OPPORTUNITY ASSESSMENT WORKSHOP

## ANSWERS TO FINANCING OF DEFERRED MAINTENANCE

by Leslie A. Solmes

**T**hroughout the month of October 1996, over 120 college and university business and facility officers and trustees from more than 50 institutions attended regional APPA Opportunity Assessment workshops. The purpose of the workshops was to train decision makers on how to develop a business plan that demonstrates each institution's potential to fund campus infrastructure upgrades from energy operating budget savings.

A collaboration among energy suppliers, technology experts, and customers, the principal sponsors and participants at the workshops included the U.S. Department of Energy, the Electric Power Research Institute, and a field of energy investment and service companies with linkages in energy information research and equipment providers. Discussion leaders from the universities of New Mexico, Southern California, and Maryland, College Park provided the field experiences that supported the APPA team of private sector consultants who developed the Opportunity Assessment model and preliminary business plans at the three institutions. (See sidebar next page for names of participants.)

What is the nature and value of the OA business planning process? The following narrative describes the nature of the deferred maintenance problem and the OA funding solution.

### Situation Alert!

Imagine you are a college or university president, vice president for business, or facilities director. You have just been informed that you need to invest \$60 million in your campus utility infrastructure or you will experience major equipment failures. You have an expanding student population and new research energy demands. The electric utility has told you that your electrical system is at maximum capacity. Your insurance provider has notified you that he cannot continue to insure your central plant unless boilers are

replaced. Your chilled water capacity meets only 80 percent of campus load requirements and has to be cycled hourly. Water pressure can't reach the third floor of dormitories to give fire protection. Outages due to electrical and mechanical system failures occur frequently, and only by sheer luck and a dedicated facility staff is the campus still operating. You have been told that no new capital appropriations or bonding for infrastructure are going to be approved from the state or your trustees to relieve your problem.

When the first major emergency comes, what will be the emergency cost and who might be injured or die? How long will you be employed? Where will the money come from? Why you? Would it help if you knew that you're not alone? Colleges and universities nationwide have a backlog of \$26 billion in accumulated deferred maintenance, many with life safety situations.

### Have Money, Would Love To Be Your Business Partner!

Who has heard of MicroClimates, Vantus Energy, Edison Source, PSCRC, PNM Energy Partners? Have you heard of Portland Gas & Electric, Enron, Pacific Gas & Electric, Southern CA Edison? These and other new energy supply/service companies are unregulated affiliates of the larger utilities and are being created daily. These companies, as well as local utilities, have tremendous capability to finance, implement, and insure upgrades of infrastructure mechanical and electrical systems. They want to be your energy supply provider. They have enormous amounts of capital to invest<sup>1</sup> along with the knowledge, resources, and desire to effectively manage the investment performance risks related to energy efficient technologies, time-of-use cost saving practices, and energy supply contracts (i.e., production and consumption systems). They are saying that energy price discounts and infrastructure investment are very attractive today. They will guarantee the savings risk. You need the savvy to know what is needed to make a good business deal.

*Leslie Solmes is president of LAS & Associates, Belvedere, California.*



## Which Road Leads Home? What is a Good Business Deal?

How do you know which direction to go? You still have so many questions. What should you ask for? What's the magnitude of value that you have to negotiate? College and university decision makers need to know the viable technical, financial, and procurement approaches that will accomplish their unique infrastructure upgrade and meet their institution's business goals, especially in situations where the only way to finance is off balance sheet. They need to be able to evaluate the magnitude of their capital investment and business implementation alternatives that work for their campus financial, technical, and energy supply situation.

Policy investment decisions to fund multi-million dollar campus upgrades using operating budget cash flow must be based on believable assumptions and pro formas that demonstrate the life cycle picture that can be controlled. How to insure the risk and measure performance has to be answered. How do you gain the confidence to commit to go forward when all you can see is the Cheshire Cat's supercilious grin?

### The Answer is Here: The Opportunity Assessment

The Opportunity Assessment is an energy service evaluation tool that helps universities compare relative economic performance and select a preliminary business investment scope and implementation strategy based on an assessment of their infrastructure investment requirements, alternative energy supply options, and financial situation. The primary purpose of the Opportunity Assessment is to define highly efficient, integrated energy production and consumption system requirements and to create a comprehensive optimization model from which a university can select a business plan and procurement process and proceed to evaluate the value of alternative private sector partnership infrastructure modification proposals and energy service contracts.

Presented in Exhibit A is an example of a University Project Summary that is 100 percent university owned and financed; this highlights the detail of the OA process. This summary demonstrates that based on reasonable assumptions with all costs defined over the term of the debt, a preliminary total project cost with financing is \$72.6 million. Annual energy budget savings are over \$8 million with annual debt service at \$6.2 million. The net present value over the twenty-year debt term is a range of \$9.5 million to \$14 million. Detailed analysis and business implementation is worth pursuing.

It is possible to run numerous sensitivities and scenarios (what ifs) to compare private sector financing, alternative rates and technical scopes, etc., to understand negotiating positions and compare the value of alternative business structures, investment instruments, ownership, performance guarantees, changes in construction cost, energy savings, costs of energy, and other economic issues that will have an impact on the total investment. An im-

portant message is that private sector investors do this kind of preliminary business planning in advance of pursuing projects where they will have to put a lot of money at risk. It's okay to ask and expect this kind of business assessment from yourselves as well as potential business partners.

In the last year, Opportunity Assessments have been conducted for three major universities. The range of each university's project investment is \$23 million to \$65 million with annual energy budget savings of \$5 million to \$7 million. These three universities are in various stages of procurement and business structuring.

### The OA in More Depth

The concept behind the Opportunity Assessment is to comprehensively and simultaneously combine highly efficient building utility systems upgrades and controls (also known as demand side management or DSM) with properly sized, loaded, and efficient campus utility supply systems. It seeks to aid the university in assessing the amount of deferred maintenance capital investment that can be funded without new appropriations and to identify the current operating budget funding levels that can be preserved to pay for the cost of utilities and capital through the term of the debt financing. The results are intended to improve the reliability of utility services, fund the upgrade of the utility infrastructure and establish an energy supply system strategy that allows the university to properly size and manage supply needs and negotiate improved supply contracts over time.

Underpinning the funding goal are any number of primary objectives that colleges and universities can also evaluate. For example, these might include: reliable long-term delivery of energy to site users; lowest life cycle cost; financial and operational risk control, especially non-performance; flexibility in long-term energy use and supply procurement; adherence to the university's mission and its community, economic, social, and environmental responsibilities. It is essential that each institution's financial goals be defined as a first stage of assessment.

The Opportunity Assessment uses a *project development approach* applying engineering, utility/regulatory, and financial expertise to create a preliminary investment project

#### Investment & Service Company Participants

Burns & Roe Services Corporation, E. Source, Inc., Edison Source, Cutler-Hammer, MicroClimates / Portland General Energy Services, Inc., Public Service Conservation Resources Corporation, PNM Energy Partners, Southland Industries, and Vantus Energy

#### Discussion Leaders

UNM—Dr. David McKinney, Donald L. Mackel & Larry Schuster;  
USC—Maurice Hollman & John C. Welsh;  
UMCP—J. Frank Brewer  
APPA—Wayne Leroy & Lander Medlin

#### Private Sector Consultants

Southland Industries—Jeff Bedell  
Energy, Economic & Environmental Consultants—John C. Tysseling, Ph.D.  
LAS & Associates, Inc.—Leslie A. Solmes



<b>PROJECT SUMMARY</b>		
(FISCAL Year Ending 12/31)		
<b>ENERGY COST SAVINGS:</b>		
Current Energy Budget	\$10,000,000	
Burning Facilities	\$100,000	
Electricity Generation	\$1,000,000	
Steam Production	\$2,000,000	
Chilled Water Production	\$1,500,000	
Gas Flaring	\$0	
Distillation & Separation	\$0	
Other	\$100,000	
<b>Total Energy Budget Savings:</b>	<b>\$3,600,000</b>	(includes savings less existing budget exclusions)
<b>Percent of Current Energy Budget:</b>	<b>36.0%</b>	
<b>TOTAL PROJECT COST:</b>		
Burning Facilities	\$1,000,000	
Engine Room	\$1,000,000	
Electrical Distribution	\$500,000	
Steam System	\$2,000,000	
Chilled Water System	\$1,500,000	
Engineering & Construction	\$1,000,000	
<b>Total Project Cost:</b>	<b>\$6,500,000</b>	
<b>Annual Debt Service:</b>	<b>\$6,201,615</b>	
<b>Energy Budget Saving/Debt Service</b>	<b>129.55%</b>	
<b>Avg. ENERGY COST:</b>		
Avg. cost for Purchased Electricity *	\$0.08	/Kwh
Avg. cost for Cogenerated Electricity	\$0.045	/Kwh
Average Cost for Steam	\$5.72	/MLBk
Average cost for Chilled Water	\$0.06	/Ton-Hr
*Average cost for utility purchased power, including waste		
<b>FINANCIAL</b>		
EQUITY	20 Years	NEW
Service Fee		Service Fee
Other Fee		Other Fee
CAPITALIZATION		DEBT FINANCING SUMMARY
Face Value **	\$10,000,000	Term Loan - Fixed
Sales Service Revenue	\$1,000,000	Short Term - Floating
Total Debt	\$11,000,000	Debt Ratio - Average
Equity		
<b>Total Capital</b>	<b>\$12,000,000</b>	

\* Includes 2% cost for all services used, excludes other costs, commission  
 \*\* Assumes 2% cost for all services used, excludes other costs, commission

### Exhibit A

scope, cost, and savings potential that could be conservatively implemented. Many alternative investment timing, infrastructure implementation, financing, and procurement strategies are available.

In order to create the operating budget savings necessary to fund the capital costs, control business risk, and address the primary objectives listed above, the Opportunity Assessment is structured based on seven fundamental concepts:

- **Integrated Demand and Supply Side Designed and Managed Solution:** Campus facility energy efficiency retrofits and real time energy controls must be considered and evaluated in concert with sizing and configuration of the campus utility systems upgrades and supply contracts.
- **Comprehensive and Simultaneous Implementation:** The investment project scope should provide for an integrated energy use and supply system upgrade that is comprehensively and simultaneously planned, financed, and implemented. The project is intended to be engineered, procured, and constructed (EPC), financed, operated, and maintained in a manner that will save money by realizing reduced equipment sizing, savings on EPC, reduced transactional costs of financing, reduced costs of project management and long-term operations and maintenance. This cannot be realized in a piecemeal approach and is essential to creating the cash flow to implement energy savings financing of the project. It is also essential in understanding energy fuel and system requirements and establishing a position to negotiate improved energy supply contracts.
- **Supply Price Solutions Based on Optimal Energy Supply Sizing, Fuel Efficiency, and Real-Time Management:** Real time energy use measurement and financial analysis, load shifting, self generation, and fuel switching technologies must be considered in the project.

ect scope in order to assess improved energy supply pricing alternatives and negotiate contracts. The first step is to install an automated energy and financial measurement and management backbone that offers real-time analysis and reporting.

- **Balancing Financial Benefits, Project Control and Risk:** Public/private financing is assumed with a separate utility services business entity formed. Private sector equity participation is included in the base case model to enable a university to secure energy expertise, finance largely with tax-exempt dollars and off balance sheet, align its business interests with a partner who earns returns based on the performance of the project and allows the university to maintain significant ownership, control, and future financial, operational, and energy supply flexibility.
- **Procurement Flexibility:** The project business strategy is based on implementing many practices now common to private sector procurement, which enhance flexibility and improve the ability to capture potential related savings. Many of these practices may be implemented independent of any particular infrastructure investment.
- **Retention Guarantees:** It is assumed that budget authority will be obtained to provide for long-term retained budget funding.
- **Maintaining Future Supply and Technology Flexibility:** The project technical and energy supply near term solutions allow for long-term energy supply solutions that are flexible and offer diversity providing for price protection and utility service reliability and risk management into the future.

As discussed above, the Opportunity Assessment benchmark analysis tool enables a university to run sensitivity tests and compare the value and risk of other project technical and financial alternatives including private sector rate and service proposals. Changing assumptions such as: energy efficiency measures, energy supply requirements, operational needs, campus growth factors, timing on construction and overhaul for varying private sector rate and service proposals, can be understood over the term of the project life. It is an essential tool to focus and guide the project business structure and the procurement process that the university will use to implement the project. It is anticipated that the model concepts and assumptions may change based on university's situation and preferred solutions.

The Opportunity Assessment base case details the model assumptions and calculations for each university's business plan, procurement process, implementation schedule, and evaluation standards. All processes begin with defining demand side management energy efficiency measures for all campus buildings. A general description of project investments might include: lighting retrofits, variable air volume (VAV) and variable frequency drive (VFD) conversion, condenser side modification, air side economizers, new cooling equipment, thermal storage, controls, monitoring/verification, recommissioning, condensate return, and others.

Implementation of these facility energy efficiency measures will affect the current campus baseline demand for



electricity, cooling, and heating loads. A load impact adjustment is essential for proper sizing of new campus supply systems upgrades. For example, a potential DSM impact at one large university resulted in a reduction in peak electrical load demand of seven megawatts and chiller capacity reductions of over three thousand tons. Further load shifting to thermal energy storage and use of absorption chillers was recommended to improve the impact of shifting electrical load.

The next step is to detail equipment specifications, operational calculations, and price assumptions for self-generation, steam and chilled water systems including fuel supply, supplemental maintenance, and standby power. For example, at one university, cogeneration assumptions included two 7.8 megawatt turbines with a 94 percent availability and 34,000 pounds per hour of steam. Cogeneration plant EPC costs were quoted assuming guaranteed performance and residual value. The cost per kilowatt hour for cogenerated power also assumed current natural gas pricing and higher prices for electrical service from outside suppliers.

University confidence in the total system cost savings potential from self-generation is viewed as the basis for negotiation with both electric and natural gas utilities for better rates. The full life cycle investment potential should be compared to utility load retention rates or cogeneration deferral rates as well as higher load factor natural gas purchases.

The operational calculations for chilled water often assume a reduction in the base case need for air conditioning due to the facility lighting retrofits.

Specific university goals will drive the chilled water system design and equipment specifications. For example, load shifting goals can result in combining electric chillers with thermal energy storage and sometimes absorption chillers to shift electrical air conditioning loads to off peak.

It is essential that the university fully understand the process for completing the Opportunity Assessment especially as it relates to system and equipment sizing and the sequence of project equipment specifications and operational assumptions. The model base case presents an energy supply and efficiency approach that is intended to be a dynamic model that the university will want to fine tune and employ for developing a preliminary business plan and creating confidence in building their project implementation strategy and measuring the results.

As reflected in the Opportunity Assessment model, an integral part of a university's utility strategy is to consider the best mix of highly efficient energy use and self generation systems, load control and traditional energy supply

(retail) services that will optimize reliability, infrastructure upgrades and cost control. This supply side base case can then be used to evaluate alternative energy supply technologies and/or rate proposals.

Because of the dynamic nature of the energy supply industry and the political and economic sensitivities of utility service to large customers, the Opportunity Assessment business planning approach must also *evaluate the local energy supply situation*, and suggest related energy supply procurement and policy strategy considerations. The highest priorities are given first to minimizing energy supply risks and second, costs. To achieve the first policy preference, strategies are considered to assure an increasingly "firm" supply of energy (at a specific, known cost). The second preference can generally be achieved by implementing programs that could shift demand to non-coincident peaking of purchased fuel requirements, higher load factors for the fuels purchased, and greater access to competitive market alternatives. The market issues impacting the achievement of these policy preferences are analyzed for each of the campus energy supplies situations with specific strategies characterized.

The base case Opportunity Assessment model is structured to meet each university's primary objectives and give them greater control of their energy supply situations into the future. In order to evaluate the ranges of business risk and economic benefits to retaining or transferring project control and risk, the Opportunity Assessment models any number of sensitivities.

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The range of business risk and economic benefits is a delicate balance of retaining or transferring control and risk to a business partner and/or energy service provider. Selection of a business partner/provider is dependent on the industry technical, financial, and political qualifications and experience of the partner as a first threshold of evaluation. The second threshold is to understand and achieve comfort with the value of the transfer of business risk and associated costs.

For example, a sensitivity analysis for one project was run to show the impact of a 20 percent private sector equity participation. This assumed that the equity partner would manage the entire project and provide performance guarantees that the university's energy budget would pay for the infrastructure upgrade. The project capital cost was lowered due to a project private sector procurement savings of 15 percent. The partner would take the downside risk on the entire debt, fuel supply, operating and maintenance costs. The university's energy operating budget would be fixed at current budget levels. Although the NPV for the project was slightly lower than the 100 percent university financed project, it was still a positive NPV. The university could evaluate the value of performance guarantees.

Due to the potential for new energy supply contracts, alternative energy pricing sensitivities are run to show the present value of competitive electric purchases and natural gas prices. An essential part of the private sector procurement may be to seek an energy supply procurement agent to help the university obtain better fuel supply contracts and potentially underwrite the entire project investment.

Possibly the most important factor in considering project sensitivities and risks is to detail the key project issues, become comfortable with the assumptions and track them in-

dividually as the project evolves. The Opportunity Assessment details all base case assumptions with the intent that these should be refined by the university as it proceeds to complete selection of its benchmark business plan.

### Summary

The Opportunity Assessment concepts discussed above use a modeling approach to capture the value of both energy

supply and use efficiency, load management, and control to realize large deferred maintenance investments. The energy system investment goal is to double the operating budget cash flow to fund deferred maintenance. A typical DSM investment potential is 25 percent savings on the annual energy budget. The Opportunity Assessment looks to create an additional 25 percent savings from highly efficient and managed energy supply systems with improved rate contracts.

### What's the Next Step?

It is remarkable that because of utility deregulation, consumers have an opportunity to drive the energy supply market and create a vast amount of infrastructure investment and economic stimuli. We may even be ahead of the curve.

A number of courses of action are being taken as a follow-up to the APPA Opportunity Assessment workshops. Numerous universities are already proceeding to complete business plans and procurement strategies for their institutions. Discussions are underway with workshop sponsors, especially the DOE, to aid in making the OA model user friendly and completing an operating manual and process document. DOE is also considering how colleges and universities can gain the technical assistance from the National Laboratories to work with private sector OA teams, as well as metering and information management manufacturing companies to provide state-of-the-art technology peer review for the engineering solutions and metering and verification infrastructure needs. Colleges and universities are encouraged to join DOE's Rebuild America<sup>2</sup> partnership program to take advantage of this resource support. (Ed. Note: We'll feature Rebuild America in the March/April issue.)

A strong synergism occurred among OA workshop participants. Thanks to the candid and free flowing discussions among DOE, EPRI, and private company sponsors, college and university participants gained a new vision of how an evolving industry can be aligned with customer interests. A network has been established that should bond and grow stronger.

Workshop participants strongly urged APPA to continue to develop workshops, case studies, and other communication materials to promote the Opportunity Assessment business planning process and modeling tool. Your input and suggestions are important to guide how this initiative should proceed. Our imagination should be let loose to structure new businesses and partnerships and rebuild campuses using the funding opportunity of a fundamentally new energy economic era. ☛

<sup>1</sup> "What to Do With All that CASH?", Charles M. Studness, *Public Utilities Fortnightly*, September 1, 1996, pp. 28-29.

<sup>2</sup> *Rebuild America* is part of DOE's Energy Partnerships for a Strong Economy. If you would like information about *Rebuild America*, please call the Energy Efficiency and Renewable Energy Clearinghouse at 1-800-DOE-EREC, or e-mail at [doe.erec@ncime.com](mailto:doe.erec@ncime.com)

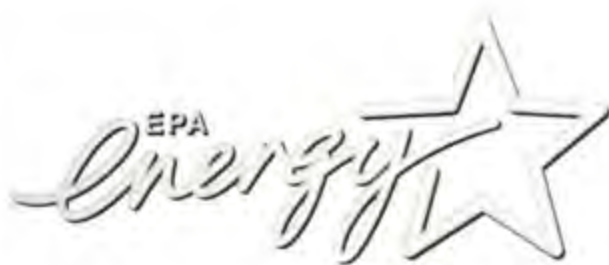
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# EPA's Energy Star Buildings Provides A Road Map to Energy Efficiency

by Michele Guarnciri

**T**he energy to run commercial buildings in the United States costs roughly \$70 billion each year. Colleges and universities spend more than \$2.9 billion annually to run their facilities. That's \$2.9 billion that could have been spent to increase the effectiveness of education, create more jobs, upgrade the physical plant, improve research facilities, dormitories, and libraries, keep tuition costs down, and strengthen the schools' competitiveness. In addition to being costly, producing the electricity to run these buildings contributes to a host of environmental problems such as acid rain, smog, and global climate change. EPA's voluntary ENERGY STAR Buildings Program, launched in April 1995, promotes the use of energy-efficient technologies as a way to prevent pollution while increasing profits.

Facilities managers face increased pressure to reduce operating costs, increase productivity and efficiencies, and downsize or cut programs that contribute only marginally to the institution's mission. The ENERGY STAR Buildings program has attracted more than 130 organizations committed to comprehensively improving the energy efficiency of their facilities and reducing operating costs. Among these organizations are colleges and universities such as the University of Missouri, Columbia (MU), the Medical College of Georgia (MCG) and the University of Cincinnati (UC). By following the ENERGY STAR Buildings staged approach, these charter partners are enjoying energy savings of up to 60 percent in pilot buildings.

ENERGY STAR Buildings was developed as an extension of the successful Green Lights Program. In order to become a

Buildings participant, organizations must already be a Green Lights participant or agree to building-wide upgrades that include Green Lights. By signing the Green Lights Memorandum of Understanding (MOU), the organization is committed to surveying its facilities and upgrading 90 percent of its lighting wherever it is profitable and 50 percent of their conditioned square footage over seven years. The MOU also commits the EPA to provide resources to the organization such as technical guidance, software, training, literature, and communications support. A customer service representative is assigned to offer support and planning assistance.

## Following the Map to Energy Efficiency

The energy to operate buildings costs \$1 to \$3 per square foot. This energy is consumed in a few major areas: lighting, air handling, heating and cooling systems, and office equipment. ENERGY STAR Buildings addresses all of these energy-consuming areas with a five-stage program designed to take advantage of system interactions to reduce energy consumption.

The five ENERGY STAR Buildings stages are: 1) installing energy-efficient lighting through the implementation of Green Lights; 2) tuning-up building systems and energy auditing; 3) reducing loads by purchasing more energy-efficient office equipment; 4) improving fan systems, and 5) improving heating and cooling plants. The first three stages of the program reduce loads and equipment size for the last two stages, thereby providing immediate energy cost savings. This strategy ensures proper load matching when major equipment is upgraded in later stages.

**Stage 1: Green Lights.** Green Lights is the stage in the ENERGY STAR Buildings Program in which most participants realize the greatest energy-cost savings, with an average 45 percent reduction in lighting-related energy use. Reduced energy costs are only part of the benefits a company will enjoy as a Green Lights Partner. Energy-efficient lighting also reduces maintenance costs, lowers cooling costs, and improves lighting quality.

Green Lights participants have also learned that energy-efficient lighting enhances the appearances of their facilities.

*Michele Guarnciri, marketing director, is the university coordinator for the Energy Star Buildings Program, an office of the U.S. Environmental Protection Agency, Washington, D.C.*



A desiccant cooling wheel and system outside the Medical College of Georgia's Research and Education Building.



ties and improves employee morale and productivity. In several cases it has been recognized to reduce production defects as a result of providing optimum light levels and reducing glare.

The Medical College of Georgia is planning to install a daylight dimming system throughout the perimeter corridors of the Research and Education Building, their pilot building. In addition to the heat load savings from installing T8 lamps and low-power ballasts throughout the interior, the daylight dimming system is expected to increase cooling load savings. The savings of more than 100 tons of cooling capacity coupled with the savings from other stages has helped assure MCG that they can get by on less than half the original cooling capacity. The equipment cost savings are expected to pay for the entire lighting system cost.

**Stage 2: Tune-Up and Energy Audits.** This is an important energy-efficient opportunity and one that ensures accurate measurement of building cooling and heating loads. Tuning up the building saves energy by eliminating waste, reducing redundancy and returning the facility to its original or intended operating design. Measures such as coil cleaning, thermostat calibrations, leak sealing, boiler optimization, reheat control, designed maintenance programs and energy management system upgrades are typical for Stage 2. An important benefit from a tuned-up building is a further reduction in cooling load that results from eliminating waste and redundancy. The ENERGY STAR Buildings Manual provides

survey forms that help identify the key items most likely to need attention during a building tune-up.

An energy management system (EMS) upgrade is a potentially important measure for the building tune-up as it can help with the building monitoring. Ultimately, the EMS will help measure the actual cooling and heating load needs of the building allowing for accurate downsizing of air conditioning equipment. However, during the building tune-up, an EMS is valuable for detecting hidden inefficiencies thereby revealing additional energy saving opportunities. For the purposes of the ENERGY STAR Buildings program, the EMS is an important tool for getting an accurate end-use pie diagram of the energy consumed throughout the upgrade process and, thus, discerning the effectiveness of the individual improvements.

The University of Cincinnati has taken energy management systems to a new level by incorporating an intelligent building system in Lindner Hall, their pilot building. The intelligent building system incorporates touch screens with pictures operating on Windows-based software utilities. It provides information on resources and services to faculty and students, but also tracks, controls, and monitors energy use through environment control equipment. When completed, the intelligent building system will allow facilities management and maintenance staff to adjust, control, and maintain equipment and issue work orders for service. It will also network with other buildings so that energy use can be synchronized and system peak power reduced.

#### **Stage 3: Load Reductions.**

Additional measures such as window films, roof and wall insulation, weather stripping, and purchasing more energy-efficient office equipment can lead to significant reductions in building heating and cooling loads. For example, window films are a metallic-based polymer film attached by an adhesive to the inside glass that reflects the solar gain away from the building. Additionally, in the winter, many films have a higher insulation factor that retards the loss of heat from the inside. At an average cost of \$2 per square foot of window area, window films are a popular building envelope upgrade choice with a payback of about five years.

Both MCG and UC are planning to apply window films to the interior of the windows for their pilot buildings. The projected savings in cooling capacity for MCG will be almost 110 tons. Although MCG receives an energy savings payback on the window film investment in just over six years, the cooling capacity savings is strategic to their successful implementation of the ENERGY STAR Buildings program.



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Roof insulation improvements are an important consideration as well, especially if it is time for a new roof. In addition, the surface of the roof can be modified with a reflective coating or simply painted white to reflect the sun's heat; a white roof is up to 35 degrees cooler than a black roof. Lower squat buildings will find more significant energy savings as the marginal cost of adding roof insulation and reflective coating is small when compared to its benefits on the heating and cooling loads.

ENERGY STAR Office Equipment, another EPA program for organizations who sign a letter of principle, offers an excellent opportunity for further HVAC load reductions. EPA provides information about energy-efficient equipment such as computers, copiers, printers, and facsimile machines that



University Hall is the University of Missouri's pilot building for EPA's ENERGY STAR Buildings Program.

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have been designed to the standards required to carry the ENERGY STAR Equipment label. Organizations purchasing ENERGY STAR computers, for example, save on average \$24 annually in electric costs per computer. The savings could go as high as \$52 per computer depending on the hours of use. However, if all computers and printers at a facility were ENERGY STAR compliant, the facility would benefit from a cooling reduction of up to 5 percent.

**Stage 4: Fan System.** The average building ventilation system is 38 percent larger than necessary. Add to that the fact that ventilation accounts for up to 30 percent of the energy used in the building, and there is a huge potential for savings. With stages 1 to 3 completed, the savings potential is increased exponentially. For example, every kilowatt of lighting and equipment load saved reduces the necessary fan capacity by up to 157 cubic feet per minute (CFM) of air. Therefore, the opportunity to replace the present fan motor with a smaller high-efficient unit will increase savings and reduce costs.

More substantial savings come from variable air volume (VAV) conversions and the use of variable speed drives. New devices such as 2x2 diffuser inserts have made VAV conversions less costly. Also, reduced motor sizes make it possible to install smaller, less expensive variable speed drives. VAV systems equipped with drives save energy when CFM needs reduce during off-peak times of the day. The combination of increased energy savings and decreased equipment costs make VAV system upgrades very profitable.



The University of Missouri, Columbia converted their existing constant volume dual duct air handlers at their pilot building, University Hall, to a VAV system. This involved installing variable air volume boxes throughout the duct work operated by a new direct digital building control system. MU also installed high efficiency motors and variable speed drives on all supply and return air fans. To take advantage of free cooling when the outside temperature moderates, they modified the air handlers for air side economizers.

Reductions in ventilation system requirements also open up options for dealing with indoor air quality (IAQ) issues. For instance, instead of opening outside dampers to bring in more outside air, many facilities administrators may elect for desiccant cooling systems. Heat recovery or desiccant systems significantly reduce the energy penalty for bringing in outside air, creating a form of energy savings. The combination of reduced inside ventilation requirements and increased energy savings make heat recovery and desiccant wheels more financially attractive.

MCG added a desiccant system to their stage 4 upgrade. Additional outside air ventilation is necessary due to the high number of medical research laboratories in their pilot building. To minimize humidity gain and the chiller energy necessary to condition the air, MCG installed desiccant wheels. The desiccant system allows them to bring in 250,000 CFM of outside air but eliminates 400 tons of cooling that would otherwise be necessary to condition the air.

**Stage 5. Heating and Cooling Plant.** The fifth stage provides the ultimate reward for the aggressive load reductions accomplished during the previous stages. The equipment used here are typically chillers, boilers, and sometimes packaged heating and cooling systems. Most of the load reductions obtained during the previous stages occur on the cooling side since these reductions tend to increase heating loads in the winter. The charter partner buildings demonstrated that the increase in heating loads occurs off-peak in comparison to the reduction in cooling loads which were on peak. Also minor efficiency modifications of the boilers could negate the energy loss resulting from the upgrade, therefore, such heating load penalties could be ignored.

Prior to launching the ENERGY STAR Buildings program, EPA initiated the ENERGY STAR Showcase Buildings program to demonstrate and verify the potential pollution prevention and energy savings outlined by the ENERGY STAR Buildings approach. EPA found that the twenty-four Showcase facilities' cooling systems were oversized by an average 60 percent. This was determined by measuring the cooling load of the Showcase buildings before making any upgrades. Also, an additional 20 percent average load reduction was obtained from the participants by following the staged approach. This means the potential for downsizing could be as high as 50 percent.

The efficiency gains with the new CFC-free chillers are significant. An old chiller can operate at full load at an efficiency level of more than 800 watts per ton. The new units have efficiency levels at full load of near 300 watts per ton and some have reached the 480 watt level. Considering that the state-of-the-art just five years ago was 600 watts per ton, the new units are 25 percent more efficient, and, compared to older chillers, they are up to 70 percent more efficient.

Additionally, if the upgrade includes the opportunity to downsize the chiller, then the energy savings will be compounded. For example, upgrading an old chiller with a new chiller that has been downsized 50 percent would provide energy savings of 70 percent.

MU was able to downsize their chiller by more than 50 percent, from 195 tons to 90 tons, on its pilot building, University Hall. Converting an air-cooled DX chiller to a high efficiency water-cooled chiller with a primary/secondary chilled water distribution system on variable speed drives, they reduced cooling energy use by more than 75 percent. Energy savings are approaching \$40,000 per year for their new system.

The ENERGY STAR Buildings program has enlisted more than twenty acade-

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mic institutions. Many facilities administrators are using the *ENERGY STAR Buildings Manual* as a guide to help them ensure the wise use of financial resources and also to unify and integrate the designs provided by their mechanical, electrical, and structural consultants. The ENERGY STAR Buildings program has also assisted them in assembling their own master energy plan while prompting administrators to fund building upgrades on a more comprehensive level. MCG is seeking funding from the State of Georgia to fund its energy projects with the assurance that savings will reimburse the funds. Some organizations are using the plan to train students as part of their curriculum or to help the institution implement energy efficiency by using student interns to perform the surveys.

The emphasis on comprehensive energy savings has significant impact on reducing pollution caused from emissions at energy generating plants. For instance, a 300,000-square-foot building in Georgia saving 3 million kilowatt-hours (kWhs) per year reduces carbon dioxide emissions by 2,250 tons, sulfur dioxide by 22.3 tons, and nitrous oxides by 8.3 tons. Carbon dioxide emissions are attributed to one of the causes of global climate change and the link between sulfur dioxide and acid rain has been well documented.

The ENERGY STAR Buildings program represents a unique opportunity for academic institutions concerned about rising costs in providing educational curricula. EPA through the ENERGY STAR programs will assist those organizations wanting to benefit from the technological knowledge, innovations, and applications the programs provide. These institutions will benefit following programs that ensure cost-effective approaches to solving their regulation issues while providing attractive rates of return and improving our environment. For more information about the ENERGY STAR Buildings Program, call the toll-free ENERGY STAR hotline at 1-888-STAR-YES (1-888-782-7937) or visit the Web site at [www.epa.gov/docs/GC-DOAR/EnergyStar.html](http://www.epa.gov/docs/GC-DOAR/EnergyStar.html).

## The University of Missouri, Columbia

In March 1995, the University of Missouri, Columbia became a charter Partner in EPA's ENERGY STAR Buildings program. Part of the university's commitment was to select a pilot building to demonstrate the ENERGY STAR Buildings program strategy.

University Hall, a building constructed in 1969, houses the university's system offices. It has three floors and a total gross area of 35,661 square feet. An energy audit was performed in early 1994 to investigate energy usage and to plan

a strategy to reduce it. The ENERGY STAR Buildings program provided the following comprehensive strategy:

**Stage 1—Converted existing lighting system to energy-efficient type.** This included electronic ballasts, T-8 lamps, motion sensors, compact fluorescent lamps, and high-pressure sodium fixtures.

**Stage 2—Tuned-up existing electric and pneumatic controls.** This included calibration of controls and maintenance on existing building systems and installing a direct digital building control system.

**Stage 3—Reduced HVAC loads.** This included scheduling equipment off during building unoccupied periods.

**Stage 4—Upgraded the fan systems.** This included converting the existing constant volume dual duct air handlers to variable air volume, installing variable frequency drives on all air supply and return fans, installing high efficiency motors, and modifying the air handlers for air side economizers.

### Stage 5—Upgraded the HVAC

plant and electrical distribution. This consisted of converting the existing air-cooled DX chiller to a high efficiency water-cooled chiller and installing primary/secondary chilled water distribution with variable frequency drives.

The first year energy reduction results are in and they are outstanding! Energy use was reduced by 60 percent. "We have been very pleased with the results of the ENERGY STAR Buildings program," says Mark Culp, MU's manager of energy engineering. According to Culp, "Implementing the first four stages of ENERGY STAR Buildings allowed us to downsize the chiller more than 50

percent. The old load was 195 tons while the new load is just 90 tons. This reduction in chiller size saved the university more than \$150,000." The savings in costs plus the additional energy savings from downsizing helped push the rate of return well above 20 percent.

## The Medical College of Georgia

The Medical College of Georgia joined the ENERGY STAR Buildings program in July 1995. They selected the 302,000-square-foot Research and Education building as their pilot facility. The three-story building, characterized by extensive glass on the second and third floors, houses a significant number of medical research laboratories. Although not all of the stages have been completed, the ENERGY STAR Buildings strategy has caused MCG to consider all of the following stages to maximize the interactive effect and reduce equipment capacity requirements.

**Stage 1—Lighting efficiency upgrade:** Plans approved but not yet implemented to install low power and daylight dim-

The U.S. Environmental Protection Agency (EPA) and the Department of Energy (DOE) have recently introduced exit signs in their list of ENERGY STAR product labeling categories. There are more than 100 million exit signs in buildings throughout the country, operating 24 hours a day, 365 days a year. That's a substantial amount of energy when you consider that each exit sign consumes between 44 and 350 kilowatt-hours of electricity per year. That means more than \$1 billion spent annually to keep all the exit signs in this country illuminated. But it doesn't have to cost this much. By using exit signs with the ENERGY STAR label, you can save \$20 per sign each year just in energy costs. Energy Star labeled exit signs are more efficient light sources that provide greater visibility and reliability, and reduce maintenance costs considerably. In large buildings in particular, these savings really add up.

If you would like additional information about the ENERGY STAR Exit Sign Program, please call the toll-free ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937).



ming electronic ballasts, T-8 lamps, compact fluorescent lamps, and LED exit sign conversions.

**Stage 2—Building tune-up:** This included calibration of controls and thermostats, direct digital control (DDC) conversion of pneumatic controls, duct cleaning, and the expansion of the old Delta 1000 Energy Management System.

**Stage 3—Reduced HVAC loads:** Plans not yet implemented to install window films on exterior windows.

**Stage 4—Upgraded the fan system:** This included variable frequency drives on air supply and return fans, installing of high-efficiency motors and a 250,000 CFM desiccant wheel system.

**Stage 5—Upgraded HVAC plant:** Plans for the replacement of one out of two 1,150-ton chillers with two smaller units and decommissioning the other unit.

"The ENERGY STAR Buildings program played a significant role in helping us determine how to handle the CFC upgrade issue," says David Smith, plant engineer. "If we had not participated in the program we may never have considered integrating the lighting as part of the solution to our chillers."

## The University of Cincinnati

The University of Cincinnati is merging elements of the ENERGY STAR Buildings Program with their leading-edge Intelligent Building Project. Developed by the Facilities

Management Department and the Computer Science Department of UC, the Intelligent Building Project has adopted Lindner Hall as its pilot campus facility for this high-tech advance into the delivery of service and information.

Lindner Hall, an 87,000-square-foot, ten-year-old building, houses the university's College of Business Administration. Within the lobby of Lindner Hall, a computerized kiosk provides an electronic support system for facility

maintenance staff, students, faculty, and college staff. The information kiosk uses a touch-screen, interactive computer to enhance communications between existing university services and the building's occupants and general users. The kiosk serves as a virtual electronic how-to book for university services to students, faculty, and staff, and various academic and administrative resources.

Facilities management maintenance staff and Lindner Hall's building manager use Windows-based software utilities, loaded into networked computers, to monitor and adjust building systems and controls. A computerized work control system issues customer-initiated and preventive maintenance work orders. The system also provides localized access to technical operating information: AutoCAD building floor plan drawings, equipment specifications, operation and maintenance manuals, and material safety data sheets. When completed, the Intelligent Building Project will incorporate graphic user interfaces and interactive menus; integrate text, graphics, video, and sound; and provide instant access to information, forms, policies, and procedures for daily business and service requests.

As a result of incorporating energy-efficient technologies under the ENERGY STAR Buildings program, UC has seen Lindner Hall's average annual electric usage decrease by 14 percent, and its electric bill drop from \$1.01 per gross square foot in 1992 to \$0.93 per gross square foot in 1995. Lighting retrofits have been completed under the Green Lights Program. Occupancy sensors operate in all classrooms to control lighting and HVAC, and research testing is presently underway on window film products for the building. A thorough tune-up has been conducted during the past year on the building envelope and weather seals to ensure optimum efficiencies. An automated energy statistical analysis program evaluates all room and building conditions in conjunction with the existing DDC system. Information is downloaded from the DDC system into a Microsoft Excel spreadsheet to analyze energy consumption.

"Innovative developments, such as our Intelligent Building Project, and participation in programs such as EPA's Green Lights and ENERGY STAR Buildings Programs, are vital to our ability to save energy and reduce pollution," says Jim Tucker, UC's associate vice president for administrative services. "Our goal is to develop a building management system that ensures that the financial and technological investment will provide the return we want, namely, a reliable and comfortable building environment operating with maximum energy efficiencies." ■

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Steve Glazner is APPA's director of communications and editor of Facilities Manager.





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by Matthew C. Adams, P.E.

**HAVING** spent the last ten years as a facility management consultant to a great many institutions, I welcome the opportunity to write this column for *Facilities Manager*. I have benefited from seeing on a first-hand basis how physical plant departments of all sizes work and, in some cases, don't work. My interest has always been in the area of facility asset renewal and management. I see fundamental changes taking place in the way that facilities administrators are doing business. Increasingly the institutions who succeed at facility management and renewal are those that adopt many of the same methods and practices used in the private "for profit" organizations.

Gone are the days when facility renewal and management was a topic to which only physical plant directors could relate. Now every responsible senior staff member of an institution must make hard-and-fast decisions with respect to facilities. Moreover, the facility management departments are now held to a higher standard. The demographic trends are clear. A large population of students are moving through grade schools on their way to college. The nationwide portfolio of higher education buildings whose average age exceeds 40 must be made capable of supporting the educational mission of higher education. I will share new

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ideas and best practices with the reader through this column in an effort to enable you to better meet the facility asset management needs ahead.

### Improving Perception Through Public Relations

As engineers, architects, and technicians of the facilities business, we forget the importance of the not-so-subtle art of public relations. All too often the only news that "escapes" from a facilities management organization is the financial accounting and the occasional sad story of insufficient resources, late construction projects, and human relations problems. Put yourself on the receiving end of this news. If you were a subjective customer of the facilities operations department what would be your perception of the department? If allowed fifty words or less, how would the average customer describe your department's activities during the last year? Would they have the slightest idea of even the basics related to your operational mission?

### Publicize or Perish

We operate in an environment where many of our customers live by the old rule "publish or perish." This action in its highest sense serves to expand the body of knowledge of a particular academician's field. However, one can make great progress in a particular field of knowledge without necessarily publishing the results. . . right? Sure, for a brief while, until the funds are cut and tenure passes you by. The perception of one who does not publish is that he or she is *idle, nonproductive, or even unprofessional*. Sound familiar? We are a combination of those

bits of information that are associated with us or our organization.

Switching to the staff side of the institution, it's clear that the senior budget officer, trustee(s), and other people of influence make decisions that directly affect the facilities management organization based not only on the cut-and-dried financial information that is required. A safely conservative assumption is that at least once each year, the senior faculty and staff of an institution make public an opinion or judgment related to the condition and maintenance of the institutions facilities. The ongoing summation or even selective utilization of this input by resource-driven decision makers directly affects the facilities organization. That being the case, doesn't it make sense to ensure that your organization is correctly "perceived?"

### Creating Positive Publicity

The basic element of public relations is publicity. In our world, the publicity associated with facility asset management and renewal can take many forms. Any accurate information that is circulated among facility maintenance and management customers is good—even if it is bad. Accurate negative press at least allows our customers to make logical and educated judgments regarding our performance. Therefore, let's focus on the upside potential opportunity of the "three Ps"—Proactive Positive Publicity.

There is a publication that I have used many times called *The New Publicity Kit* by Jeanette Smith and published by John Wiley & Sons Publishers. This publication is a good down-to-basics reference that has application to nonprofit entities as well as for businesses. I suggest



this as a good first read for those that want to utilize public relations to enhance the operational mission on a daily, as well as long-term, basis.

#### **Publicity and Support Through University Management**

The first and most effective method of broadcasting your organization's message is by a formal committee structure. I've seen a great example of this effort at the University of California at Berkeley. Johnny Torrez, director of physical plant, and Peter Lin, associate director, took a public relations risk that has paid off. Every six months the department hosts the "Deferred Maintenance Policy Board." The idea of a deferred maintenance committee in and of itself is not particularly interesting or unique. However, the participants of this committee are unique. Torrez and Lin made the decision to allow the leadership and significant stakeholders of the university to actively manage the deferred maintenance effort at Berkeley. On this board are the chancellor, the vice chancellor, the three provosts of Research, Graduate Professional Schools, and Letters and Science. Also included are the directors of the Library, Space Management, and Capital Programs, and one representative of the Faculty Senate. The physical plant staff directly related to facility renewal efforts at Berkeley participate as well. From a public relations standpoint this activity is a winner by every definition. In reality, prior to the formation of this board, the physical plant department was continually criticized for inattentiveness to the renewal needs of the campus.

#### **Newsletters**

Newsletters are another good vehicle for public relations. Within the institutional setting the production and distribution of a newsletter is relatively inexpensive as well. Perhaps there is already an internal newsletter circulated within the facilities group. Once again, the idea here

is to broadcast news through another vehicle to the facility customers (in other words, everyone). Any newsletter worth its weight serves the following missions:

- ▼ educates its readers
- ▼ extols the merits of its publisher
- ▼ publicizes the publisher and sometimes even the reader
- ▼ further opens the lines of communication between customer and service supplier.

Yes, everyone gets too many newsletters already, and most of them are boring or too sales oriented to be useful. However, in the institutional setting there are two things that are more valuable than all else to your customers—salaries first and work space second. We are all a little vain and self-serving by nature. Use this to your advantage. In the process of creating content for a monthly or quarterly newsletter the editor of the facilities department's newsletter

maintains that readers will always read this newsletter if it is likely to contain information about the facilities where they work and any changes or improvements that will affect them.

#### **Creating an Effective Newsletter**

Your newsletter could contain information related to each of the distinct building occupant departments or college/schools. For example, the current inventory of deferred maintenance broken down by buildings occupied by the Biology Department can be addressed at least annually. The utilization of any capital renewal funding is clearly detailed with respect to how it affected a particular department. The bad news of continued backlog is also recapped. Include enough statistics to represent the work load of the maintenance department. If we can track this, and we should, state the number of work requests by department and the aver-

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age response time of the work control center. It's in the best interest of the physical plant staff that the customers know the magnitude of your operations.

The best example of this that I have seen is the newsletter that Jim Christenson of the University of Michigan publishes. The University of Michigan levies a student infrastructure fee of \$150 per semester. The physical plant department is actually required to periodically report vis-à-vis newsletter and student newspaper how this money is being utilized for renewal. The newsletter's editor describes the specific nature of facilities at the University of Michigan.

Always use the newsletter to recognize the professional achievements of the staff members of the maintenance department. To maintain professionalism, try to avoid too much reporting of personal or social issues related to your staff. An internally circulated newsletter is more appropriate for this. At least one article per issue educates the customers about the nature of the facility renewal and maintenance business. There is a large body of written material related to the deferred maintenance problem in higher education. Use this text periodically to reaffirm the need for increased resources dedicated to facility renewal.

Publish the operating procedures of the various maintenance activities, from custodial to the power plant. Describe how deferred maintenance is identified and catalogued. Most customers have no idea about the methods or frequencies of maintenance. When spelled out the department clearly appears more professional and effective. A good case study is the comparison of maintenance costs of an aged building before and after a significant renovation. It is an important point to make that planned and preventive maintenance is much less expensive in the long run than "putting out fires" in an old building with systems that are well beyond the limits of their natural life cycle.

## Media Events

Charitable foundations and politicians both use the media event to inform and persuade. In one brief presentation, speech, or event the focused attention of your constituents can be had. During this brief moment lies the opportunity to make a clear and concise statement of past achievements, future goals, and the supporting facts. The professionalism and credibility of the event will be directly associated with your cause or, in this case, department. Facilities officers may not actually plan a true media event with local television and radio. However, there is clearly internal media within every institution.

The most credible and successful facility asset management programs in the United States share this one activity in common: at least once per year the facilities organization makes a formal presentation to the faculty, staff, trustees, and student representatives regarding the "State of the Union (campus facilities)." Once this tradition of annual presentation is established, the image of the facilities operation is enhanced. With this comes appreciation for renewal efforts and sympathy for insufficient resources. Every year illustrate to the customers how much was spent on facilities for upgrade, code compliance, and other improvements. Establish this event on the same date each year. Provide specific graphic examples. Illustrate the continued need for reinvestment and the specific budget request for the coming fiscal year. If benchmarking favors your pitch for additional funding, use comparative financial findings from competitive institutions. This increased awareness and understanding of progress, or even loss of ground, can only help the credibility of the facilities management organization.

## Benefits of Publicity

The lack of any facilities management public relations initiatives dam-

age the facility department's image. Without a doubt, positive publicity and accurate negative exposure are supportive. The customers that observe and comment on the activities of the facilities group both directly and indirectly influence the business officers of an institution. It is reality that the default judgment of an uninformed staff or faculty member is not in favor of the facilities maintenance organization. When left unchecked, a consistently negative perception of the facility maintenance organization will become a self-fulfilling prophecy. Resources and support will be continually diminished in direct relation to the confidence of the faculty and staff in your operation.

In other words, perception will become reality. The professional decision is to take a proactive public relations posture and influence and direct the image of the department. The most basic of public relation tools are available and effective for facility management professionals. The standing goal is to garner increased support and resources for the facility renewal efforts of the institution. To that end, the fundamentals for public relations are:

- ▼ a management team that learns the basics of effective public relations
- ▼ facility asset management committees or boards
- ▼ informative and useful facility newsletters
- ▼ an annual "state of the facilities" address.

Throughout the institutional community the precedence is clear. Those facility management organizations that have made concerted efforts to broadcast the goals, actions, and results are granted at least an even playing field within the institutional community. That basic opportunity is an improvement for many maintenance organizations. The upside potential from there is unlimited. Remember to follow the lead of the faculty and "publish or perish." ■



# The Bookshelf

Book Review Editor: Dr. John M. Casey, P.E.

Organization Development: A Practioner's Toolkit, by Lenny T. Ralphs, Ph.D. Crisp Publications, Inc., 1996, 120 pp., softcover.

Occasionally, one is presented with the opportunity (perhaps in the form of a directive) to change the course or composition of one's department. Determining what's wrong or what really has to change is necessarily the first step to be taken before deciding how to implement a reorganization. To that end, books, articles, and gurus abound, each promising a path to "The Answer"; they abound to such a degree that mere mortals find themselves bewildered by so many choices and absolutely no way to relate any particular method to their organization. Dr. Ralphs' slim, 120-page volume seeks to bring some method to that madness.

Defined as a "practioner's toolkit," Ralphs takes the reader through some very basic steps defining organization development and providing key words in O.D. speak. He then proceeds to lead the reader onward through a cursory history of organizational development and outlines the principles of O.D. before launching into the possible reasons for wanting to undertake a change in the first place.

Presuming the reader is not lost at this point, the second chapter is devoted to the selection criteria for a consultant and what to beware, followed by chapters that outline in more detail both the primary steps

involved in any organizational development process, and the recognized methods for achieving the ends desired.

Frankly, in spite of the title, the book is not written for someone who actively engages in organizational development, but it offers a glimpse to the reader of what they might expect to find in a O.D. practioner's toolkit—sort of like looking into a doctor's bag to get an idea of what medicine is all about. Presented as one in a series of Crisp 50-Minute self-study books, this work is an organized series of information bites rather than flowing prose. Each page or couple of pages jump in logical

progression to a point-by-point synopsis of a different subject, the whole sprinkled with the occasional cartoon. That particular style left me paging ahead, then paging back to pick up on a thought I had caught earlier, only to page ahead again to see why I had paged back which I found confusing. The author also presented a short fictitious case study, which I think was presented to drive home a point or to offer an example, but he split the study between chapters, leaving me with the impression that the study was filler material with no real purpose.

As far as being a toolkit for a practioner, I would say Ralphs' book is de-

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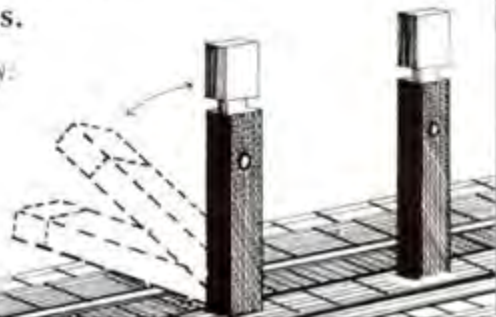
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signed for the rank amateur who needs an introduction to the field and certainly is not a "how to" book in any sense of the phrase. While it offers questions (with spaces for answers) to check the reader's comprehension of the material, I found the inclusion of these questions distracting and somewhat pointless. However, acknowledging that this book is presented as a comprehensive self-study manual, others may find that the questions improve the overall "read."

Lest I leave the reader with the thought that the book is without merit, let me hasten to add that the chapters on planned change and interventions offered good thumbnail studies of a variety of possible methods ("Interventions" in O.D. speak) which could be employed to begin the process of organizational development. That in itself would be extremely helpful to someone completely new to the field, as it

leaves the reader with a working knowledge of what is available and the steps involved for each approach. The author also outlines some of the pros and cons of each approach so that a neophyte could make some reasoned assumptions about what could work in his or her organization, and render a decision for a course of action based on this knowledge. Overall, I would say that the book could have been laid out better and shortened without damaging the content, yet it provides some valuable information for persons looking to wet their feet in this broad topic.

**Organization Development** is available from Crisp Publications, 1200 Hamilton Court, Menlo Park, CA, 94025-1427.

**Ralph P. Thayer**  
Director of Maintenance  
Swarthmore College  
Swarthmore, Pennsylvania

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**Mar. 17-18—Planning for Master Planning.** Berkeley, California.

**July 13-15—1997 Educational Conference & Annual Meeting.** Orlando, Florida.

### Other Events

**Feb. 5-8—Master Management Maintenance Workshop.** Marrero, LA. Contact American Services Resources, 714-770-5212.

**Feb. 16-19—CUPA 1997 National Seminar.** Washington, DC. Contact Cheryl Schnitzius, Conference Manager, 202-429-0311, Ext. 387.

**Feb. 17-19—1997 AFE Spring Maintenance Management Conference.** Greenville, SC. Contact Cindy Taylor, 888-222-0155.

**Feb. 18-19—Carolina Plant Engineering & Maintenance Show.** Greenville, SC. Contact Professional Trade Shows, Inc., 800-545-1407.

**Feb. 24-28—Asbestos Abatement for Inspectors and Management Planners.** Salt Lake City, UT. Contact University of Utah, Registration Coordinator, 801-581-5710.

**Feb. 26-27—South Florida Plant Engineering & Maintenance Show.** Ft. Lauderdale, FL. Contact Professional Trade Shows, Inc., 800-548-1407.

**Feb. 26-27—Southwest Plant Engineering and Maintenance Show and Conference.** Phoenix, AZ. Contact Professional Trade Shows, Inc., 800-548-1407.

**Mar. 4-6—Telecommunications Infrastructure Planning.** Anchorage, AK. Contact Andrea Luoma, Washington State University, 800-942-4978.

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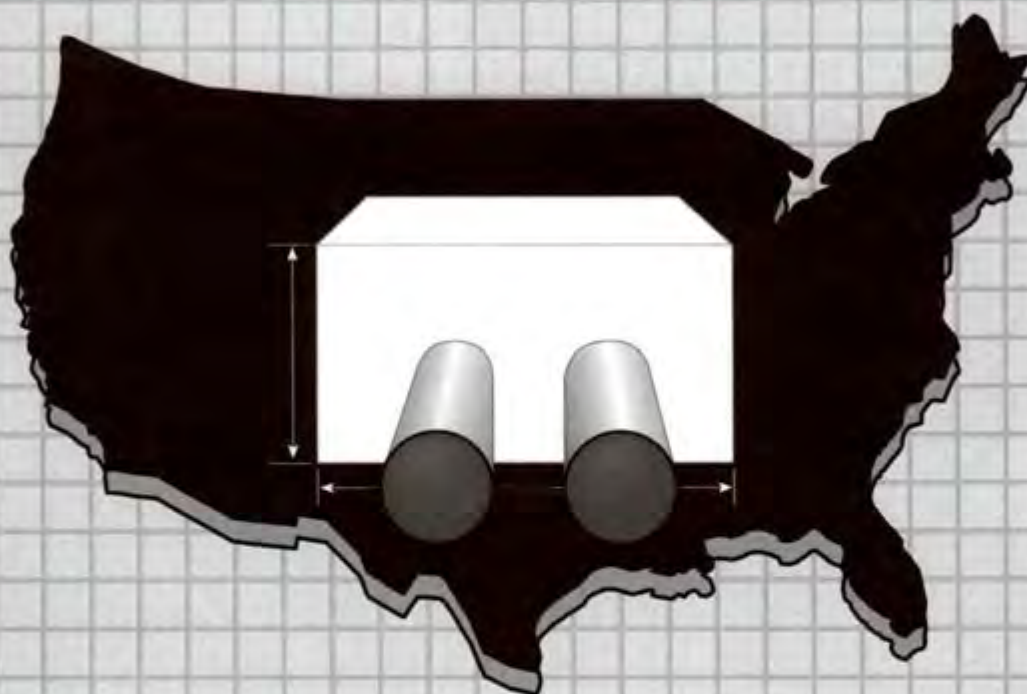
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