Building a Constituency for Good Facilities Management: The Missing Link for Maintaining Energy Efficiency in Public Sector Buildings

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Over the last decade, Washington State has spent millions of dollars on public building energy efficiency projects. These investments have generated substantial energy savings, but have made only a small dent in the sector’s savings potential. Savings from these investments have not persisted over the long-haul because these investments are seldom backed by good energy management practices. Good energy management practice requires excellent facility management practice and continuous investment to maintain quality. These conditions are rare. This paper discusses why exceptional facility management practice is rare and the strategies Washington State is developing to change this in the public sector. Although some obstacles, issues, and solutions raised here are unique to the public sector, many also apply to commercial buildings.

There are many barriers to good facility management. They include barriers between capital and operating funds, competition for limited funding, restrictive regulations and public works laws, poorly designed facilities, inadequately trained staff, absence of measurement and maintenance standards, and lack of incentives for good maintenance. These barriers are infrequently addressed in many energy efficiency and energy management programs in the Public Sector. Most have only minimal requirements for properly maintaining energy efficiency measures which are insufficient to counter the many obstacles to good facility management. Investment in efficiency is much less than the potential, and when investments are made in efficiency measures results fall short of estimates.

Over the past ten years, the Washington State Energy Office (WSEO) has attempted to address facility management barriers with classroom and on-site training programs, awards and recognition, financing, and mandatory design review for new facilities. We have had some success, but it has been modest because we had not dealt with what we believe is the root obstacle—the lack of a constituency supporting improved facility management practices. As a result, the State of Washington is refocusing efforts in two areas: (1) developing public policy support for facility management within State government, and (2) supporting efforts to raise the professional level of maintenance and building operations staff.

INTRODUCTION

WSEO has promoted energy efficiency and energy management practices in public buildings for more than ten years. During this period, public institutions installed over 2,000 energy efficiency measures intended to save $9 million per year through WSEO administered programs including Bonneville Power Administration’s Institutional Buildings Program (IBP), the federal Institutional Conservation Program (ICP), and the oil overcharge funded Power Washington program. Institutions have also installed many other efficiency improvements through utility and Energy Service Company (ESCO) programs and have undertaken some energy management efforts of their own. Building operator programs have trained over 1,000 clients on energy efficiency and management issues during the last six years.

While these efforts produced substantial short-term, local benefits, the long-term, statewide results were limited. Energy efficiency is not broadly practiced by public organizations in Washington even though they are often well aware of the potential benefits. Efficiency programs have achieved less than expected results. Washington State public buildings have over $30 million per year of cost effective energy savings potential (Baylon et. al. 1991), yet after five years the State has captured less than $2 million in savings (Kunkle 1995). Although facilities managers and policy makers know that good energy management can provide many potential benefits, these benefits have not motivated the long term support needed for good energy management.

Even when investments in efficiency are made they seldom achieve potential. In a review of public sector efficiency program impact evaluations Schueler (1990) found that most institutional conservation programs realized between 50 and 80 percent of estimated savings. While there are many causes for the gap between measured and estimated savings (Nadel & Keating 1991), in numerous site visits to Washington State...
facilities (described below) we found inadequate facilities management as a key cause. Washington’s experience is not unique. Many studies have pointed to operations and maintenance as the Achilles Heel of energy efficiency efforts (See next section for examples). Facilities staff do not want this situation. Many are very dedicated and do excellent work given the limited funding, training, and support available to them.

Why can’t we do better? Are we missing a fundamental obstacle to good energy management? What do facility managers have to deal with day-in and day-out that limits their ability to manage energy effectively? Have we been misdirecting our efforts by focusing our resources on installation of energy efficient equipment and energy management as activities separate from good facilities management? We believe the answer to the last question is yes. Until we create an effective constituency for good facility management, progress towards energy efficiency will remain slow. By supporting efforts to increase demand for good facility management practices, we believe we will improve energy management practice. In short, we need to aim higher and attempt to transform the market for facility management. The next section outlines the evidence that brought us to this conclusion. We conclude with a description of current initiatives underway in Washington State.

FACILITY MANAGEMENT AND ENERGY EFFICIENCY

Good facility management ensures that a building and its systems perform in accordance with design intent and the owner’s and occupant’s needs for the intended life of the building at a minimum life cycle cost (this includes all costs for utilities, operation and maintenance, replacement, and modernization). The link between facility management and energy efficiency is poorly addressed in the design of energy efficiency programs. Most leave the responsibility for facility management to the building owner and hope it will be taken care of. This hope is seldom realized.

Common Expectations About Facility Management in Buildings Related to Energy Efficiency

A complex mix of facility management actions involving the interaction of several parties over several years must occur to successfully construct a new building, remodel an existing building, install energy efficiency measures, or establish an energy management program (Figure 1). The actions seldom occur as needed and, consequently, many energy efficiency efforts fall short.

Energy conservation project developers often make nine implicit assumptions about facility management in buildings. Rarely are all or even most of them true for a given facility. Even more rarely are these issues explicitly examined.

1. The design team will account for operation and maintenance staff needs. The building will be designed to make operation and maintenance as straightforward as possible.

   Design guidelines for new public buildings contain standards for function, appearance, and safety. They seldom address facility management needs. In site visits to a sample of recently completed K–12 schools in Washington State we ran across one facility where access to air handling units to perform maintenance and change filters was so restricted that it was unsafe for maintenance staff to work on them. Over time these systems will use excessive amounts of energy because they will not be maintained properly. In the IBP, approximately one quarter of the energy efficiency measures partly or completely failed or performed poorly as a result of poor design and installation that did not account for the maintenance and operation needs at the facility (Kunkle 1990).

2. The contractor and engineers will adequately document as-built conditions and provide adequate owners’ manuals for use by facility staff when they take over responsibility of the building. Facility staff will have all the documentation they need to properly operate and maintain the building.

   Building systems change constantly. Modification to original building design occurs during construction and throughout the building’s life. Equipment is added and removed. System drawings are not always modified to reflect these changes. For example, in 1994 WSEO conducted an on-site training program at a small group of hospitals (Kunkle & Burrell 1994). The staff at one of the hospitals was particularly enthusiastic about the training and were eager to apply what they had learned to their facility. However, when they went to the building system drawings to determine what they were going to do, they found the drawings were not current and they did not have the information they needed to proceed. This problem is not uncommon, missing or incomplete documentation is frequently cited in case studies of building commissioning. (Portland Energy Conservation, Inc. (PECI) 1995, 1994)

3. The contractor and designers will provide facility staff with adequate, hands-on training on how to effectively operate and maintain the building and building systems.
Facility staff will know how to operate and maintain the building.

On completion of a new building or energy management retrofit, facility staff typically receive a set of manuals, a walkthrough and overview of the building systems, and a limited amount of training on how to operate the equipment. Control systems are one of the bigger problem areas. Instruction seldom includes training on using the control system to optimize building performance. The experience of a facility manager at a small school district in Southwest Washington we visited as part of an evaluation of our Energy Conservation Report Process for new public schools was not uncommon (Kunkle & Pope 1993). When the manager showed us the computer that operated the control system for his school the dust was so thick that it was clear it was never used. The manager reported that the few hours of training he received were not enough for him to understand how the system worked. He made some follow up calls, but was unable to turn up anyone with the knowledge to help him. The manager had given up on the system. He was unable to take advantage of the energy efficiency opportunities that the control system offered. The building was using more energy than necessary because the control settings had not been adjusted to reflect how the building actually operated.

(4) The facility staff will be given a building that operates as designed. Building systems will be verified to be working properly.

Poor function of newly built facilities is common. Most verification of building systems is by checklist. This proves that something has been installed, but not that it operates properly. Given the complexity of modern building systems, it is no surprise that occasionally wires are misplaced, or something is wired backwards. More complicated problems can go on for many years and are a constant drain on facility management resources. One new junior high school in Washington had a number of minor problems, resulting in uncomfortable and unhealthy conditions for building staff. Despite the problems being minor, it took more than a year to identify and correct them, at great time and expense on the part of the school district (Kunkle & Pope 1993).

(5) The facility staff will have the skill and capability to operate and maintain the building. They are well-trained professionals.

In a recently completed survey of state maintenance practices, 11 of 17 Washington State agencies surveyed indicated a high need for in-service training (Herzog 1996). Over half said the availability of this type of training was low. Agencies do have minimum training and experience requirements for hiring new staff, but once hired, staff have limited professional development opportunities. In a 1995 survey of 594 Northwest facility managers, 30 percent said their operations and engineering staff attend less than one job-related training a year. An additional 59 percent said staff went to one to three job related trainings a year. Many of the these trainings were devoted to handling specialty situations like hazardous materials disposal or meeting changing regulations. Training opportunities are in fact weakening and not being improved. Traditional sources of training are no longer available. Union training programs are less available and electric utilities are reducing their support for training. Several building managers we interviewed reported that it was becoming much more difficult to find trained building operators (Schueler 1996). Modern buildings are very complex and contain systems that directly impact the health and safety of building occupants. The professional standards for facility staff are not as high as one might expect, given their level of responsibility.
Energy efficiency will be important to the building owner, occupants, and facility staff. They will take a strong interest in meeting energy efficiency goals.

An evaluation of the IBP in Washington State revealed that most of the participants had no idea whether the energy efficiency measures installed in their buildings were meeting energy savings projections. Usually, they did not know whether their energy use was going up or down. However, they were satisfied with the program as the result of benefits from improved lighting systems, improved building appearance, new mechanical systems, and the financial grants they received. The energy efficiency program was a means to an end—it helped improve their programs and the services they offered (Kunkle 1990).

Capital improvements are the way to improve building energy efficiency and overcome operation and maintenance problems. Operation and maintenance measures are secondary, results can’t be measured.

Most energy efficiency programs have emphasized the installation of energy efficiency hardware (capital improvements) rather than making low cost changes in operation and maintenance practices to improve efficiency. For traditional program providers (utilities and ESCOs) hardware installation meant hard savings; operation changes meant soft savings that did not persist. In particular, elaborate control systems were often viewed as an operation and maintenance and energy panacea. In fact, the opposite was often true. Control systems created more problems than they solved. Hardware improvements were also more consistent with the concept that energy efficiency is a resource. Energy savings from operation and maintenance were seen as small and difficult to measure. However, in the rare cases where efforts were made to directly address operation and maintenance procedures, significant energy savings were achieved at low cost (see below). Many of the utility rebate and federal incentive programs have deliberately excluded operation and maintenance measures from programs on the basis they aren’t measurable, they should be doing it anyway, or the paybacks are so short (under 2 years) that it will happen. This ignores the reality in many facilities. Staff capability and resources are limited and inefficient processes are entrenched. The irony is that without effective, long-term operations and maintenance, the savings from hardware will diminish or disappear all together.

Adequate resources will be provided to properly operate and maintain the building over its life. Energy efficiency measures have a 10 to 25 year life.

In a 1995 survey, ten of the 17 largest Washington state agencies identified deferred maintenance backlogs totaling $207 million (Herzog 1996). Eighty-eight percent of the agencies believe the backlog will grow. Agencies currently devote approximately 25 percent of their facility maintenance budgets to preventive maintenance (the remainder is spent on correcting problems). They believe they should be spending 60 percent on preventive maintenance (Herzog 1996). Failure to provide adequate preventive maintenance leads to premature failure of building systems and excessive energy use. At the university level, much of the budget is fixed by legislative mandates to maintain or expand enrollment while cutting costs. Maintenance budgets are often the first to suffer.

Building owners and decision makers will understand the link between good facility management, energy efficiency, and the health, safety, and productivity of the building occupants. They will know that cutting maintenance costs in the short term will only end up costing them more money in the future.

A U.S. General Accounting Office report (New York Times 1995), stated that one-third of the nations public schools are in such poor repair they provide unsuitable or unsafe conditions for children. A study in Washington DC schools concluded that standardized test scores would be 5 to 11 percent higher if physical conditions of schools improved (Hanson 1992). According to an American Institute of Architects study, 90 percent of all building complaints arise from building comfort as it relates to operation of the climate control system (Dunn 1994). Many of these problems relate to indoor air quality. According to a Steelcase survey of office workers, 37 percent of the respondents in the United States believe poor air quality is a serious hazard (Sterling et al. 1992). A Department of Energy report indicated that less than half the heating, ventilating, and air-conditioning systems in the surveyed commercial buildings were regularly maintained. Yet maintenance budgets are often the first to be cut when resources are tight. None of the Washington State agencies surveyed had any internal incentives to improve maintenance practices besides energy savings.

Energy Efficiency Potential Resulting from Good Facility Management

Improved operation and maintenance procedures can reduce building or system energy costs by 10 to 30 percent (Haberl et al. 1994, PECI 1995). The practices leading to energy savings can be grouped in the following categories: (1) turning off lights and unneeded equipment where possi-
ble; (2) using efficient temperature settings; (3) using efficient operation strategies (taking advantage of control system capability); and (4) performing preventive and predictive maintenance and repair.

When facilities addressed operation and maintenance issues comprehensively they found and corrected many problems resulting from poor facility management and achieved significant savings.

- Over a two year period, the Texas LoanSTAR program identified operation and maintenance measures in 133 buildings projected to save $4 million in annual energy costs (Haberl et al. 1994). These savings represent 23 percent of total energy costs in the buildings. The program expects 90 percent of the recommended measures to be implemented. The Texas LoanSTAR program was a pioneer and developed many leading edge measurement tools. However, the approach is capital intensive and requires significant expertise.

- In a study of seven midsize Minnesota office buildings, energy costs were reduced 8 to 21 percent simply by operating the buildings in accordance with design intent. The most frequent operation problem was excess equipment and light operation during unoccupied periods (Herzog & LaVine 1992).

- The Rouse Company developed an energy task force to aggressively attack the operations and maintenance aspects of reducing energy costs. The company saved over $2 million in a two and a half year period with no capital expenditures at the 69 properties involved in the program (Owens 1994).

- An energy management program combined with a preventive maintenance program at Spokane School District reduced the annual energy budget by $592,000 over a four year period (WSEO 1989). Battleground School District implemented low cost operation and maintenance efficiency improvements (they spent less than $2,000) and reduced energy costs by 37 percent ($200,000) in the first year (WSEO 1991).

- The Resource Conservation Manager (RCM) program developed in Oregon has been adopted in Washington State. The Vancouver School District in Clark County recently hired a retired principal as an RCM. In the seven month period beginning in September 1995, the RCM program achieved an estimated $92,000 in utility savings through more effective management of resources. The program also received $166,000 in utility incentives for efficiency improvements.

BARRIERS TO FACILITY MANAGEMENT

Obstacles to good facility management are many, complex, and are all interrelated. In Figure 2 we identify the major barriers we have encountered and describe how they are linked.

Which one is most important? It depends on one’s perspective. For example, some facility managers and staff may view fragmented budgeting (and the resulting limited and inconsistent funding) as the key issues. Other managers may point to restrictive regulations and public work laws. Administrators and funders may view the absence of measurement and maintenance standards as critical. In fact, as the diagram suggests, most of the barriers are linked. Overcoming one obstacle often requires resolving another. Arguing about which are more important leads in circles. It is important to dig deep and identify root causes.

No one fights for well-maintained buildings. There is not a widely recognized professional constituency setting performance standards, or placing pressure on legislative, executive, and institutional decision makers to invest in operations and maintenance. Figure 2 shows how the lack of a strong constituency creates a vicious cycle that perpetuates itself. Lack of resources and respect for the building operator and the importance of operation and maintenance results in a lack of standards, benchmarks, and information that is necessary to support a constituency for facility management. This results in a lack of resources for training and deferred maintenance. Performance declines and ultimately results in higher long term costs to schools and state and local government to operate and maintain public facilities, potential health, and safety liability issues, and reduced productivity of public workers that occupy public buildings. This further weakens any constituency and support for facility maintenance.

The way to break out of this cycle is to develop the constituency at (1) the institutional level within government which will establish and support state policy on facility management; and at (2) the professional level within peer organizations to support professional standards for professional facility managers and staff. With these in place, standards and performance benchmarks, and best practices will get more support, lead to improved performance and better information that further strengthens the constituency. The next section describes efforts underway in Washington State to strengthen the facility management constituency.

EFFORTS TO IMPROVE FACILITY MANAGEMENT

In the preceding discussion we have painted a rather gloomy picture of the discontinuity between the perceived quality
of facility design and management, and the reality of what actually occurs in buildings. One may marvel at the fact that any substantial improvements in energy efficiency are achievable, let alone sustainable. Yet real savings do occur and we believe that there is reason for some guarded optimism about future trends. Our reasons are three-fold. First, we have a much improved understanding of the relationship between good facilities management and energy efficiency and we know how to achieve well managed buildings. Second, there is a growing realization, especially in the public sector, of the limited ability to fund new construction and the need to preserve the massive investments in existing facilities. Public sector managers and legislators are heeding the public’s call for keeping government expenditures low.
while making better use of existing facilities. Third, and perhaps most important, building managers and operators are working hard to effectively operate and maintain buildings despite the obstacles.

We conclude above that strengthening the constituency for facility management is the key to long-term energy efficiency. Here we provide some examples of the types of solutions Washington State is pursuing. Many of these actions show promise, but there is little long-term operational experience on which to make firm conclusions about their effectiveness. Nonetheless, we remain encouraged by their potential to improve the quality and performance of public facilities.

**Build Public Policy Support**

The Washington State Legislature’s House Capital Budget Committee and the executive branch’s Office of Financial Management (OFM) are both focusing on the need for improved maintenance in state facilities. The House committee has conducted a review of state agency maintenance practices (some of the results were cited above) and is now refining model maintenance legislation for the 1997 legislative session. OFM has convened a policy committee composed of representatives from most state agencies, community colleges, and universities, to address issues of capital policies including maintenance. The committee’s maintenance subcommittee has developed a set of recommendations on improved maintenance, several of which are described below.

One concrete example of the increased awareness of facilities maintenance comes from Washington State University (WSU). A survey of alumni and parents who visit the WSU campus in Pullman found that the number one positive comment about their experience at the university was the top notch appearance of the grounds and facilities. As a consequence, the university’s top administration became acutely aware of the link between facilities maintenance and alumni satisfaction which, in turn, translates into alumni financial support (Royer 1995).

The interest in facility maintenance by the legislature, OFM, and others in state government along with the efforts of the House Capital Budget Committee and the maintenance subcommittee has generated some new initiatives and brought to light some existing activities. Here are four examples.

**Building Construction Specialist (assumption 1).** In response to the lack of a direct connection between the facilities planner/design and the maintenance staff, WSU has created a Building Construction Specialist position. Among this person’s duties are requirements to “[a]ct as a liaison between Facilities Development and Physical Plant regarding document review, construction, commissioning, and warrantee issues on Capital Projects.” The position is also charged with integrating maintenance and operations personnel comments and recommendations into the facilities design process. The position is a relatively new creation so there is little information on its long-term impacts. However, it represents a clear realization of the long-term consequences of capital expenditures.

**Building Commissioning (assumptions 3 and 4).** Building commissioning has developed into a new and distinct discipline which focuses on ensuring that both new and existing buildings will operate as they were designed. The literature on commissioning is large and we will not focus on the details except to provide one example from Washington State. At the recent Northwest Building Commissioning Conference the University of Washington (UW) provided some case studies of the benefits of commissioning. The UW invested $829,000 in the commissioning of four highly complex science buildings. The purpose of this investment was to be able to “move into a building[s] that WORKS!” The University also cited substantial savings in the maintenance and operating budgets. With commissioned buildings maintenance staff did not have to “misdirect” their limited maintenance time to trying to get new buildings to work right when they needed to overhaul existing facilities (Heinz & McCray 1995).

**Deferred Maintenance Pilot Program (assumption 8).** Lack of sufficient resources for maintenance activities is a particularly acute problem for public facilities with hundreds of millions of dollars of deferred maintenance accumulated at Washington State facilities. The OFM maintenance committee is considering a fully funded pilot program that will attempt to make up the backlog of deferred maintenance in one or two selected small agencies over a two to three year period. The pilot will help to determine if it is possible to effectively make up for years of maintenance neglect.

**Plant Operations Support Group (assumption 9).** Finally, to help address the lack of good information exchange about the links among energy efficiency, good facility management, life/safety, and worker productivity the Washington State General Administration Department (GA) has developed a Plant Operations Support Program. The goal of this program is to provide a clearinghouse of information on what works in public facilities management. Its goal is to take the vast amount of experience, research, and knowledge about good facilities management and its benefits and make it easily accessible to facility managers and operators statewide (MacKenzie 1996).
Build Professional Capability

A second positive sign is a growing recognition among building managers that:

- Building a staff’s professional capabilities is essential;
- The way building operators are trained must be changed to reflect more complex building environments and issues they must contend with; and
- The value of trained building operators must be recognized and paid for.

Washington’s goals are changing from short-term provision of training services and tools like energy accounting software to a long-term strategy with the ultimate goal of transforming the market for building operation services.

Building Operators Certification Program (assumption 5). The cornerstone of Washington’s effort is establishing a voluntary certification program for building operators. Historically, the Energy Office and community colleges offered several energy management classes targeted to building operators which were heavily subsidized by the Bonneville Power Administration (BPA) and other electric utilities. As a result of utility restructuring and major budget cuts at Bonneville, the era of utility subsidy for building operator training began to end in 1994. WSEO and the community colleges were asked to find a way to make building operator training self-sufficient. It was out of this need that Building Operator Certification took shape. Luckily for Washington, a neighboring state, Idaho had done important pioneering work in certification through the Idaho Building Operators Association (IBOA). IBOA’s experience increased the acceptability of the idea in Washington and with utilities.

Washington State established an industry advisory group which has met since the fall of 1994. Group representatives include the Building Owners and Managers Association (BOMA), the Washington Association of Maintenance and Operations Administrators (WAMOA), and the community colleges. The group established a curricula and outlined the desired features of a certification effort.

Outline of Certification Proposal. In 1995, vocational educators and energy office staff in Oregon, Washington, and Idaho created a common vision for the certification. As currently envisioned the certification would be:

Industry-led. Certification will be developed and administered in conjunction with industry and industry associations. Competency based. Those certified must demonstrate they can perform key maintenance and operations tasks. In addition, they must complete an application project before final certification.

Oriented to efficient operation of building and equipment systems and preventive maintenance as a system. Most available training focuses on specific subsystems, trades, or equipment. The certification curricula would be designed to teach understanding and efficient operation of buildings as a complete system.

At Three levels. Each level requires completing seven to ten, half-day to two day seminars and an application project.

- Level 1—Foundation Seminars targeted at all Operations and Maintenance (O&M) staff and managers. This is an introduction to good building O&M practice.
- Level 2—Building operation, maintenance, and troubleshooting seminars targeted to building operators and building operators certification program engineers. These hands-on seminars emphasize preventive maintenance and efficient operations strategies for overall building management in addition to troubleshooting and operation of specific systems. Level 2 certification would require successful completion of an application project.
- Level 3—O&M Manager Certification targeted to lead facility men and women and focuses on maintenance management and administration issues.

Filling An Important Need. Was a voluntary certification for building operators something that the industry and public facilities wanted? To test this, WSEO conducted a region-wide mail survey of building managers in the fall of 1995 (Schueler 1996). Response from Washington’s public sector was strong. We received responses from managers in 60 to 75 percent of the schools, local governments, and state agencies in the state. The response and coverage in the commercial sector and in Oregon, Idaho and Montana were weaker because of less targeted mailing lists. See Schueler 1996 for a summary of regional survey results.

There was strong overall support for certification. Almost all building managers said a certification would be very (59 percent), or somewhat (34 percent) useful. Only 7 percent said it would not be useful.

Most, about 85 percent (Figure 3), reported their organization would support certification for some staff. This level of support was quite high, since strong support was described in the survey as paying course fees and increasing job responsibilities and compensation—something that can be particularly difficult in the public sector. Those indicating moderate
support would encourage participation and recognize certification achievement.

There were very few negatives. Fourteen percent indicated they were neutral or had limited support. Most of these truly were neutral and would leave participation up to staff. An analysis of written responses from elsewhere in the survey suggested that fewer than 5 percent were actively opposed to a building operator certification.

Certification is likely to be incorporated in hiring practices. Fifty-nine percent said certification would influence hiring decisions and another 30 percent indicated that it may be considered.

There is strong support for the proposed approach to certification.

- 93 percent want certification to focus on preventive maintenance and troubleshooting of systems and equipment.
- 74 percent said that certification should require 10 to 15 daytime or evening classes.
- 66 percent said that it was very or somewhat important that the certification be competency based.
- 54 percent said it was very or somewhat important that ongoing training is required to maintain certification.
- 51 percent said regional or national certification was important.

What Next? The survey results confirmed the certification effort was on the right track. The project is moving forward. Classes are being developed and tested in the spring and summer of 1996. Discussions are underway among public and private organizations, utilities, and trainers to build funding partnerships, identify the certifying body, and establish the administrative structure to deliver the certification. With the closure of WSEO in June 1996, these activities will move to Washington State University Cooperative Extension Service and GA.

The initial strategy is to get the certification and supporting training designed, tested, and established enough to be self-sufficient. This is expected to take up to two years. Although the certification is designed to generate immediate results on the practice of those who participate, it is important to understand that certification is part of a long-term strategy. The real benefits may not show up for five to ten years. They include:

- Changing training models for building operation to take a more system-oriented approach.
- Focusing attention on the importance of preventative maintenance.
- Raising the value of training.
- Incorporating certification as a major consideration in the selection of operations and maintenance employees and contractors.
- Raising the professional status of building operators to strengthen their voice in the design process, commissioning, and during competition for capital, operations, and training funds.
- Raising the standard of practice and providing a network for identifying and sharing information on best available practice.

Supporting and Partnering with Existing Facility Managers Groups (assumption 5). The Washington State Public Sector Energy Program has historically maintained ties with WAMOA. WAMOA is the largest organization of public sector facility operators and managers in the state. It is active and very effective. Its members are largely from public K–12 schools, but it recently has welcomed membership from other public sector organizations. The Public Sector Energy Program has been working to strengthen its relationship with WAMOA. An example of this is the Resource Management Conference sponsored by the Public Sector Energy Program and coordinated with WAMOA to immediately follow their annual Conference. This provided an opportunity for linking energy with facility operations and for peer exchange among different groups. The public sector energy program will continue this mutually beneficial collaboration in the future.
RESULTS/CONCLUSIONS

The links among successful energy efficiency efforts, good energy management, and high quality facilities management are well established. Cost-effective, long-term energy savings will quickly disappear without attention to the larger context of facilities management. We believe that active development and support of a constituency for facilities management is the key for improving facility management and energy efficiency in public facilities. We have shown that such a constituency is beginning to develop as governments recognize the need to preserve their multi-billion dollar capital investments and new construction opportunities wane. Public building managers and operators are trying to do a good job maintaining and operating their facilities. To the extent that we can remove the obstacles identified here, we will see substantially more energy efficient, well operated buildings. The clever ESCO, utility-based energy business provider, or government energy office will recognize this opportunity to develop and support a constituency for their energy services and products. Ultimately all will benefit as new markets develop and public buildings become better places to learn, visit, and work in.

REFERENCES


