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# CONSIDER THE CULTURE: LESSONS LEARNED FROM NEW COMMERCIAL PROGRAMS

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## Introduction

Energy programs geared to new commercial buildings demand that program sponsors insert themselves successfully into the complex culture of the people who design, fund, and build these structures. Even when armed with substantial financial incentives for their customers, utilities are finding that program representatives must be sensitive to the viewpoints, personal relationships, and pecking orders of owners, architects, and engineers; to critical path elements in building design and construction; to past traditions and experience; and to codes of behavior.

The increased efficiency of new commercial buildings offers large opportunities for saving energy, both immediately and for future decades. Understanding, working within, and responding to the cultural aspects of building design and construction is an important element in achieving these energy savings. "The design community" is an apt phrase; utility decision makers and commercial program managers need to enter that community with a "when in Rome" attitude if they are to deliver effective programs.

The authors of this paper have collectively consulted with or conducted process evaluations on six major new construction programs in the Northwest and Northeast—Energy Edge, Design Assistance, and Energy Smart (all sponsored by the Bonneville Power Administration); Design 2000 (New England Electric); Energy Conscious Construction (Northeast Utilities); and Energy Standards Plus (Central Maine Power). We have begun to uncover some cultural aspects that deserve examination and attention; these aspects tend not to be covered in formal program implementation manuals or in technical training.

While many program staff learn these cultural ropes on the job, we will try, in this paper, to offer some helpful observations and guidance. However, please bear in mind that two of the three of us are "cultural anthropologists" and only one of us claims to be an actual member of "the design community." New commercial programs are quite recent and there is still a lot of digging to be done.

This paper is organized into two sections. The first section examines cultural assumptions in four new commercial programs: Energy Edge, Design Assistance, Design 2000, and Energy Conscious Construction. The second section examines how well these various assumptions seem to be working and offers guidance for constructing new commercial programs consonant with the culture surrounding the design and construction of new commercial buildings.

## Program Designs: Reflections of the Culture

New commercial programs are designed to accomplish similar purposes with similar audiences. Targeting owners, developers, architects, and engineers, they strive to:

- Avoid "lost opportunities" for saving energy by building in greater efficiency.
- Move the market—design teams and trade allies—toward more efficient designs and products.
- Reduce peak demand and/or reduce the need for new power plants, thereby saving the utility (and shareholders/ratepayers) money.

While purposes and audiences overlap, new commercial construction program designs and procedures—somewhat surprisingly—vary significantly. Among the programs we have reviewed, some offer much technical assistance; others offer little. Some emphasize recognition and status for owners and design teams; others do not. Some are largely menu driven; others bring together design teams, energy experts, and utility staff to examine all the energy saving possibilities thoroughly. Most offer incentives, but one did not and still achieved some success.

What engenders these differences? It appears to us that those who design the programs have definite (but not the same!) views about the preferences and motivations of their target audiences: owners, developers, architects, engineers, contractors. These views tend to shape the program design. Let us take a brief look at some of these assumptions embedded in the program design.

*Energy Edge* was both a pioneering test program and a major research effort exploring the effects of energy efficiency improvements in new commercial buildings. Based on studies of decision making in the sector and consultations with the design community, it was structured as a design competition—an activity somewhat peculiar to the design community and traditionally focused on architects. Building sponsors hold these events, inviting architectural design firms to compete; typically, firms must submit building designs, including detailed architectural models. Often the costs to compete are high and the firms may be paid to compete.

With *Energy Edge*, the competition format had a twist. Bonneville funded the regional program and four sponsors administered it—the state energy offices from Washington and Oregon; Pacific Power, a private utility; and Portland Energy Conservation, Inc., a non-profit organization. The sponsors were responsible for tailoring the program to their territories, which varied considerably in terms of climate, design traditions and sophistication, building activity, and population.

In general, owners and their design teams submitted projects for consideration to the four sponsors and received design assistance for developing energy systems within the projects. Those entering the competition did incur costs, however, and only the most promising buildings—in terms of energy innovation, certainty of construction, design replicability, and savings—were selected. Participation in the program was an involved process, and finalists received energy modeling assistance and substantial financial incentives as well as recognition.

*Energy Edge* seemed to assume a number of things about what motivates members of the new commercial construction culture. It assumed winning a competition is important, especially to architects, the traditional respondents to design competitions. Furthermore, with its emphasis on winning, innovation, and recognition, it assumed owners and design teams want their buildings to be part of an elite group. It paid the greatest attention to those in the design process rather than to those who construct buildings (for example, the general contractor), and assumed part of its purpose was to educate. It also assumed the demands on participants would be offset by the rewards.

Another BPA-funded program, *Design Assistance*, was actually developed as a consolation prize for the losers from *Energy Edge*, some of whom complained they had not been selected after a good deal of work. However, as operated in Washington State, it was also opened to a wider group of commercial projects. This program was not a competition and did not apply the same criteria for selection (e.g., innovation); in fact, it suffered somewhat by accepting almost all applicants, even when it was unlikely they would benefit from the program (for example, when they were too far along in the design process).

*Design Assistance* matched design teams with expert energy consultants. Through scoping meetings (where the design team and the consultant discussed energy-related design possibilities) and energy modeling, *Design Assistance* provided expert advice and hard numbers on energy savings and costs. It did not provide financial incentives for energy improvements, and asked only that participants seriously consider the recommended measures. This approach, while fairly in-depth and tailored to each project, also allowed the program to avoid lengthy contracts. As with *Energy Edge*, education of the design community was also a goal.

*Design Assistance* assumed that owners and design teams wanted good information about energy efficiency and, once presented with this evidence, would want to build more efficient and higher quality buildings on their own. Part of its intent was to see how well a new commercial program could go without incentives in fostering greater efficiency. By keeping red tape and obligations low, however, it also recognized the often tiny part that energy considerations play in constructing new commercial buildings and the substantial time pressures on designers and owners.

*Design 2000* at New England Electric Services Company has some different design features than either Ener-

gy Edge or Design Assistance. At this time, the program is largely prescriptive—that is, buildings are not modeled and participants most often choose from a menu of measures which have incentives attached. A custom approach provides for individually determined incentives to cover measures not on the menu. Design 2000 emphasizes simple and painless participation. It does not emphasize in-depth analysis of all possible measures, innovative measures, or increased learning among participants. It does provide technical assistance, but computer modeling is not a central feature.

Design 2000 assumes that owners and design teams are on a very fast track, that energy concerns are of minimal interest to them, and that ease of participation, along with incentives, is paramount. It is less focused on educating the design community. In addition, it assumes a fair amount of similarity rather than variability across commercial projects (hence, the menu approach).

*Energy Conscious Construction* at Northeast Utilities offers both a prescriptive, menu driven path for smaller, simpler buildings (which are often further along in the design process), and a comprehensive approach for larger, more complex buildings at an early stage of design. However, this program has emphasized and put many resources toward the comprehensive approach, which includes a brainstorming session, use of outside energy experts who advise but do not interfere or direct the design process, computer simulations of an average of 15 measures per project (based upon a process evaluation in the spring of 1991), and an emphasis on educating and building relationships with members of the design community, especially engineers.

More than the programs discussed above, Energy Conscious Construction assumes that a new commercial project needs a flexible range of approaches, from prescriptive to comprehensive. It assumes that educating the design community and changing the marketplace over time go hand in hand, and that these activities will require considerable effort. It tries to accommodate innovation, complexity and interaction among energy measures.

## Cultural Lessons Learned

It would be wonderful if we could pinpoint which cultural assumptions work the best so an ideal new commercial program could be developed. Unfortunately, this analysis is not clear-cut, since most of the assumptions to date have some validity and the results are not yet in on their relative success. However, some signposts for success are surfacing from reported experiences and the

process evaluations that have been completed on these programs.

## Program Flexibility

The evidence so far suggests that flexibility is a key to successful new commercial programs if they are to attract the widest audience. Flexibility in this case means the ability of the program to adapt itself efficiently to the varying needs of projects and the configuration of design teams (small or large; complex or simple; with severe time constraints or more reasonable schedules; having substantial energy savings potential or only small potential; owner- or design team-dominated). A number of these flexibility issues are discussed in more detail below.

Both Energy Conscious Construction and Design 2000 have consolidated some program options while making program guidelines more flexible, so that staff can tailor the program to the client. Flexible programs, however, are not necessarily the strong suit of utilities, and utility managers must deal with the tension between the need for clear program guidelines and the need to serve the building community effectively.

## Design Competitions

The competitive overlay to these programs added to their complexity and created winners and losers, generating some displeasure. Subsequent programs have abandoned this mechanism.

## Recognition

Energy Edge offered recognition and visibility for participants; evaluations show this was an important element to those participants. Later programs (Design 2000, Energy Conscious Construction) include the notion of recognizing participants for their participation, but our evaluations have shown this follow-up has not materialized. When asked, some participants, particularly those with a strong local presence, say they would like greater visibility for their efforts, since it will help them market their buildings and services.

## Prescriptive vs. Comprehensive Paths

There is an ongoing debate over how prescriptive new commercial programs can become. Those who defend the menu approach feel many facilities will not participate if too much is asked of them, and that design teams are not very interested in the complexities of efficient design. They also feel a menu of energy im-

provements can adequately cover most projects, and that a prescriptive approach saves money.

Advocates for the comprehensive brainstorming and modeling strategy offer many arguments in its favor. They feel this approach helps weed out false savings, such as overinsulating supermarkets. They also believe that most true energy innovation occurs within the process of design, where a design problem is being solved to meet an owner's or architect's requirements. Moreover, they contend that commercial buildings often use energy in a very different way than residential buildings, that many energy savings opportunities are serendipitous within the design process, and that such savings cannot be anticipated by an "off-the-shelf" approach.

Defenders of the comprehensive design assistance approach also say this is the only way the marketplace will truly change, since design teams are required to think about energy efficiency, and the selection of more innovative efficiency measures cannot be merely prescriptive. In addition, they feel that interactive measure effects need to be studied. Comprehensive approaches also allow program sponsors to gain a stronger foothold in design communities since there is much more interaction. However, comprehensive design assistance approaches need to include research providing better documentation of the cost effectiveness of energy saving strategies so that the process can be as streamlined as possible.

The truth seems to be that menu-driven options fit certain projects and design teams; comprehensive services fit others. For instance, a large warehouse with few energy saving possibilities may be well served by a prescriptive approach. On the other hand, a small grocery store may offer a complex set of possible improvements. Thus, both approaches are needed. This requires a well-trained and experienced staff who can apply complex program guidelines and make judgements about which program option will work best to get the maximum energy savings from each project. Having and supporting both approaches, therefore, is one component of a flexible program.

### **The Role of Education**

Educating the design and construction community is a complicated proposition in new commercial programs. Design teams and owners are knowledgeable about what they do and they want to be respected for their knowledge. Design teams—especially architects—tend to have healthy egos and they do not want to be embarrassed in front of owners, which can happen when energy experts are brought to the table (Owner: "What? You don't know

about T-8 lamps, electronic ballasts, variable frequency drives or low emissivity glass when they would save me all that money?") On the other hand, architects and engineers often pride themselves on their openness to new and better information, since they do want to improve their products (buildings).

Learning needs to be perceived as a collegial exchange, not as a transaction from expert to student, even though we have encountered a number of instances where design professionals know little or are misinformed about energy efficiency in commercial buildings (for example, some believe increased insulation will necessarily increase efficiency which is not always the case). This type of learning also builds mutual respect between program sponsors and the community. Design Assistance showed that the respectful providing of good information was well received by participants. Energy Conscious Construction also has successfully insinuated its energy experts into the brainstorming process for its comprehensive design assistance area, exhorting them to be advisors but not "designers" or "directors."

### **Incentives**

Dealing with up-front and operating costs (for owner-occupied buildings) is important to the success of new commercial programs. Design Assistance, while able to achieve savings without incentives, also lost cost-effective savings because it did not offer incentives. Several current programs, such as Design 2000 and Energy Conscious Construction, succeed in structuring acceptable incentives for energy improvements (up to 100% of incremental costs in many cases), but tend to offer design incentives that are considered too low. Architects often have to take on additional administrative burdens but make no design changes, and engineers feel they are not adequately compensated for the extra time it takes to redesign energy systems which may or may not end up receiving incentives.

### **Optimal Entry Points**

Most new commercial programs try to be flexible about the point at which projects take advantage of their services. Evaluation results show that new commercial programs should enter early on in the schematic design or design development stage, before substantial psychological and financial investment has been made in the design. Results from surveys of participants in Design Assistance, Energy Conscious Construction, and Design 2000 show that participants think early entry in the design process is an advantage and allows greater energy saving

options, while entering at later points is a disadvantage which effectively diminishes the real consideration of options.

Unfortunately, design community traditions do not help in this regard. Plans for new buildings are often kept secret, and owners and developers are not necessarily visible. It is an ongoing challenge to penetrate this barrier. On the other hand, it is possible to get to a project too soon, so that a good deal of time can be wasted trying to design around an amorphous entity. Also, the optimal program entry point for architects seems to be earlier than for engineers; for example, architectural choices affecting energy use may involve glazing options which typically are decided early. Engineers are more involved with HVAC equipment selection, which happens somewhat later.

### Other Timing Issues

Beyond the program entry point, timing remains a critical issue. Schedules for new commercial buildings are notoriously tight and contractors can be penalized if schedules are not met. Program implementers need to help make sure specialized equipment is available within the project's time frame and at the right point in the project; it will not do to have glass or lighting fixtures arriving at the wrong time in the construction schedule. Indeed, the potential unavailability of the more innovative equipment may be enough to squelch interest. In a number of cases, contractors have made less efficient substitutions because the equipment called for under the program was not available. Program staff indicated this was not an attempt to take advantage of the program (to be paid for more expensive equipment that was never installed); rather, it satisfied the need to keep the project on schedule.

### Marketing

Marketing and outreach for new commercial programs must be persistent, innovative, and personalized. Successful program staff become enmeshed in the local design community—which tends to be a fairly clubby culture—by being active in local professional societies such as the American Institute of Architects and ASHRAE. They also become involved in other local organizations, such as the Chamber of Commerce and local school building committees, and build a network of contacts. They concentrate on providing excellent service so that word of mouth is strongly positive about the program. Successful staff also tend to combine sales and engineering skills. Such marketing approaches imply the need for program staff to stay with the program for the long term, so that their associations can bear fruit.

Other successful marketing avenues for new commercial programs include inserting the program into the usual information sources of design professionals, such as architectural and engineering associations, and through owner groups like hospital administrators, school administrators, or grocery store owners; presenting program information in traditional formats, such as at luncheon meetings; advertising in trade and specialty magazines; and garnering newspaper coverage for completed projects.

Marketing efforts to various members of the project team—owners, architects, and engineers—need to be targeted according to the roles they tend to serve on these projects. While roles are certainly subject to variability, we have found that architects, on average, tend to be more concerned with aesthetics and less informed about energy efficiency. On the other hand, engineers tend to like hard information about technical matters and are somewhat conservative in the energy systems they design. Owners more often focus on the economics and have the final word about what equipment will actually be installed. Contractors, who surface more in smaller or simpler jobs, are more concerned about installation and construction matters than design issues.

### Roles of Project Team Members

There are various configurations for new commercial project teams. One common situation involves an owner who hires an architect who then hires an engineering firm. The owner deals almost exclusively with the architect, who is the project manager and has little direct interaction with the engineers. Meetings among all the actors are rare.

In this situation, the architect is used to being the primary contact with the owner. Programs that bring all the team members to a brainstorming session are taking some risks, since this is likely to be a new and uncertain situation. Team members may not have established relationships. It is unlikely the architects have focused upon energy efficiency in this way before, yet they may have marketed their work as energy-efficient and innovative. In all our interviews, we have yet to meet a design professional who does not report developing efficient systems already!

Although the architect may be a pivotal player in the project and have the owner's ear, the engineer is much more likely to understand energy efficiency and will have a bigger role to play in energy-efficiency programs. In addition, cost-effective energy-efficiency improvements tend to require engineering expertise and not architectural skills. This leaves the architect with little to do and

few rewards for participation. Yet the architect could be influential for repeat business since it is generally the architect that the owner hires.

To diminish this potential problem, extra attention—and perhaps incentives—may need to be directed to architects so that they feel more included in the program process. We found that many architects in the Energy Conscious Construction program turn over the entire design incentive for the brainstorming meeting (\$1,000) to the engineers, so that they absorb the costs of a three- or four-hour meeting. In our evaluation of this program, architects tended to be less satisfied with the program than engineers or owners, especially if they received no financial or design rewards.

In other cases, the architect is left out of energy-efficiency decisions entirely, or there is no architect and the owner deals directly with the engineering firm. On smaller, simpler jobs, the owner may deal just with an electrical contractor. These configurations happen when the owner knows about energy efficiency or is motivated to achieve the greatest efficiency possible and the architectural elements of the building are standardized. In these cases, the current new construction program designs may better fit with the decision-making structure of the design teams.

### Process Evaluations

The complex culture of new commercial programs certainly poses a rite of passage for program evaluators. Anyone undertaking an evaluation of these programs needs to understand that it is often difficult to unravel how decisions are made about energy-efficiency measures. With more comprehensive approaches, some of these decisions may become clearer, since modeling at least addresses which measures are likely to be cost-effective. However, many measures drop out due to owner or designer preferences, and these reasons are harder to capture during evaluations; participants simply may not recall why they decided to include or not include certain measures—and program staff do not necessarily record this information.

These evaluations also clearly show it is difficult to reach decision makers. Typically, they will agree to be interviewed, but only after the evaluator has tracked them down and found an early morning, evening, or Sunday appointment when they can have an in-depth discussion. Those who develop tracking systems for new commercial programs encounter problems with how much information to include and ensuring its accuracy. Given the tremendous amount of data and the changing or stop start

nature of new commercial projects, developing an adequate tracking system can be quite difficult, although not having a good one clearly hampers evaluation efforts. The tracking system for one program is still being developed, and individual regions have developed their own systems. For another program, the tracking system is running, but we encountered some need for information that was unavailable as well as some inaccurate data.

Other challenges in evaluating new commercial programs include how to accommodate changes in standard practice and building costs; how to deal with organizational changes in the utility, including staff reassignments; how to handle changes in the economic health of an area; and how to integrate all the different and important perspectives of people involved with the program.

### Conclusion

Utilities around the country are investing a great deal in the promise of new commercial energy efficiency programs. A great deal of time is spent in developing the economic and technical bases for these programs. An equal amount of time needs to be spent in understanding the culture of the design community to insure the motivation, satisfaction and cooperation of these crucial decision makers. The success of new commercial programs is fragile; it depends upon the goodwill of target audiences who have not traditionally focused on energy efficiency and whose ties are stronger to each other than to the utility. If relationships with the design community are damaged, it will take a long time to rebuild them, even with substantial incentives.

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