

SUCCESSFULLY MARKETING THERMAL STORAGE
IN COMMERCIAL BUILDINGS

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ABSTRACT

This paper first reviews the key hurdles to thermal energy storage. Next, case studies of three electric utility thermal storage marketing programs are reviewed. The results of these case studies, as well as advice and experiences from other commercial sector marketing efforts, are synthesized into a set of lessons of experience and guidelines for those who are considering developing a thermal storage marketing effort.

- Design expense
- Unfamiliarity
- Space requirements
- Difficulties in finding the decision-maker
- Financing
- Trends toward use of packaged unitary equipment.

INTRODUCTION

Since the early 1980s, there has been a resurgence of interest in thermal energy storage for commercial buildings. Thermal storage, most commonly implemented in the form of cool storage, represents one of the closest things to a "free lunch" available in today's energy scene to both utilities and customers. For electric utilities, thermal storage provides a means of reducing peak electrical loads and increasing sales in off-peak periods.

For building owners and managers, thermal storage offers reduced electricity bills, potentially lower capital costs, and increased operating flexibility. Combined with utility incentives, thermal storage can offer very attractive paybacks (such as less than three to five years). Currently, over 34 electric utilities are offering incentives for installation of thermal storage systems.

The range of incentives that are being offered by electric utilities is tremendous, ranging from only advice to up to \$500 per kW of capacity shifted to off-peak periods. Similarly, the market penetration of thermal storage systems varies tremendously. There is, however, low correlation between the amount of utility incentive and the penetration of the thermal storage system. Obviously, other factors account for the differences between penetrations that we observe. Some of these have to do with the local climate and the amount and type of construction that is occurring in the local area. But, utility marketing effort is also an important determinant of the success of thermal storage. Incentives by themselves are insufficient to overcome the hurdles for installing thermal energy storage systems.

Key Hurdles to Thermal Energy Storage. The successful adaption of thermal energy storage faces a number of hurdles. These include:

- Risk
- Capital costs
- Reluctance from design team

Let's briefly review each one of these key hurdles. The design team is traditionally risk-adverse. Consulting engineers and architects have every incentive to go with systems that they know will work and perform as specified. The design process is not really set up to encourage builders, owners or designers to take risks and experiment with new systems. The advantages of the new system must be overwhelming before the design team is willing to accept the risk or concept. Fortunately, thermal storage is becoming more common, and the perceived risks associated or specified in such systems are diminishing. For example, we now know that there are well over 100 systems in the United States, and over 30 of them have been operating for three to five years.

In the past, thermal energy storage systems have had significantly higher capital costs than traditional cooling systems (although with new design practices, the capital cost penalty of thermal storage systems is being minimized, and, in some cases, thermal storage systems can be designed to be less expensive than the conventional systems). The high capital cost has presented a significant hurdle. While some builders and developers are willing to accept higher capital cost if there are reasonable paybacks, there is also a criterion that the capital cost cannot be too much higher. For example, we have heard frequently from developers and builders that they expect a 10% to 20% higher capital cost if the paybacks are in the three- to five-year range, but if the capital cost is more than 20% higher than the conventional system (even if the payback is in two to three years), it will be difficult to raise the money to pay for that additional capital cost. This reluctance of incurring higher capital costs can be viewed as another manifestation of the risk-adverse nature of building owners and developers.

The design team is often reluctant to explore new design concepts. There are several factors leading to this: risk as discussed above, and the expenses spending more time developing specifications and doing the design for approximately the same fee as designing a conventional system. In addition, recently liability concerns have emerged, making architects and engineers reluctant to try new concepts.

Design expense can be a hurdle because, as mentioned before, designing a thermal energy storage system frequently takes more time than designing a conventional system. Yet, the designer's compensation is about the same for two systems. The designer will be more than willing to take on this added design expense if there are rewards to him or her in terms of professional recognition for energy efficiency design. He or she needs to be an expert in the system in order to be competitive in the marketplace, or to be convinced that such systems will significantly increase his or her customer's satisfaction for the product.

Unfamiliarity can be a terribly crippling hurdle, because people react out of misconceptions. Moreover, they spread these misconceptions, and the marketer is always having to address these misconceptions. Frequently, decisions are made based on misconceptions and cast in concrete before the thermal storage marketing representative even becomes aware of the impending project. For example, in a recent focus group that I conducted, a group of engineers with an average of 20 years of experience in major design firms throughout the country all professed that they understood thermal storage. Yet as the group session proceeded, it became obvious that they had only a cursory acquaintance with thermal storage. Most of them, for example, had a concept that the space requirements for storage tanks were greater than they are in reality. Thus, these prestigious and leading designers systematically dismiss thermal storage, because they think the space requirements are too burdensome. This is all based on a misconception.

Space Requirements. The most frequently voiced objection to thermal storage is the space requirements. "Where am I going to put those storage tanks?" "Space is too valuable for us to use for storing water or ice."

Space requirements need not be the stumbling blocks to thermal storage. In fact, hundreds of buildings throughout the country, many of them in major urban areas, have found space to put in thermal storage. The tanks can be configured flexibly to be located in underutilized or unused spaces, and thermal storage can reduce space requirements. For example, chillers are frequently downsized to fit in smaller rooms. In addition, with the many thermal storage design concepts, lower temperature airs can be used which reduces the size of ducts and air handling equipment that is required.

The most challenging part of marketing thermal storage systems is finding the decision-maker. HVAC decisions in commercial buildings frequently have a number of different people involved, ranging from the building operator, building manager, maybe a professional real estate manager, consulting engineer or architect, and ultimately, the building owner. All of these people are involved in making decisions, and each one can exercise a veto over any given alternative. This means that all parties must be marketed to, and that the marketing

approach must be tailored for each one of these parties. But, one has to also remember the ultimate decision-maker is the owner or developer, and it takes a meeting with the owner/developer to close the sale.

As noted earlier, financing thermal storage systems can be a major hurdle. Thermal storage frequently has higher capital costs than conventional systems. In many commercial buildings in many areas of the country, thermal storage is competing with cogeneration systems. Cogeneration developers frequently offer a package deal, including financing for the cogeneration system; thus, in competition with cogeneration, the thermal storage may fare poorly, even though it offers more attractive economics, because of the difficulties of raising the added capital costs incurred by the building owner or developer.

Over the past two decades, there has been a strong trend towards the use of unitary packaged equipment. Thermal storage is basically running counter to this trend. The reasons for use of unitary packaged equipment include low design costs, high operating flexibility, ability to install pieces of the system as a building is occupied, ability to customize the size or capacity of cooling to individual occupants' requirements, and the ability to allow occupants to control their own air conditioning. The disadvantages of this packaged unitary equipment is frequently higher capital costs per ton and capacity installed, and lower operating efficiency. However, the advantages seem to, in many cases, outweigh the disadvantages. Thermal storage is essentially a central system, but it does offer some of the flexibility of unitary packaged systems, especially in economically meeting different cooling requirements for different occupants on differing operating schedules.

The list of barriers to thermal storage seems to be mounting, yet some utilities have been successful in developing strategies to overcome these hurdles and promote the market acceptance of thermal storage. Let's look at some case studies.

Texas Utilities Electric Case Study. Texas Utilities Electric (TU Electric), servicing central Texas, developed a program to promote thermal storage to provide capacity relief to 595 MW by 1995. The program consisted of the following items:

- TOU rates
- Rebates
- Trade ally liaison
- Direct mail
- Direct contact
- Customer testimony.

As you can see from the range of elements of the TU Electric marketing program, the effort was comprehensive. It included multiple contacts and emphasizes direct contact. This effort was integrated into an on-going marketing effort that TU Electric has maintained. For years, TU Electric has been developing a rapport and credibility with

the designers and building owners throughout their service area. When the utility decided that it should be in the business of marketing thermal storage, it already had the support for a successfully marketed program.

What are the results of this program? Over 4.1 million square feet of thermal storage have been installed, another 4.7 million square feet with thermal storage is under construction, over 10 million square feet of thermal storage is being planned, and over 30 MW of demand has been shifted. In 1984, the program had achieved over 38% market share for all new buildings over 50,000 square feet.

What are the lessons of experience? One, developers are willing to develop thermal storage. Some of the first and largest installations were installed by developers. That segment in the market, most people think, is the least willing to undertake a system such as thermal storage. Two, thermal storage is being installed in a wide range of building types and ownerships. Three, engineers are very supportive of the thermal storage concept. Four, the benefits statements used in marketing thermal storage needs to be audience specific. Major audiences include the architect, the owner, and the engineer. Five, successful program must be on-going, emphasize direct contacts and presentations to both specifiers and owners.

Southern California Edison Case Study. The objectives of the Southern California Edison thermal storage marketing effort are to shift peak loads, increase optic sales and provide customers with alternatives to compete with uneconomic bypass. The major elements of the Southern California Edison marketing program include:

- Cofunding a feasibility
- Special off-peak rates
- Financial incentives
- Direct customer contact focusing on key market segments and specifiers
- General media advertising.

The results of the Edison marketing program includes over 30 MW of installed capacity, another 28 MW capacity under construction, a total of 88 different installations. Sixty percent of the installations are new construction, and 40% are in existing construction.

Lessons of experience from the Southern California Edison program include: 1) prior commitment in marketing enhances thermal storage marketing efforts; 2) programs should promote the concept of thermal energy storage rather than a specific technology such as ice storage or partial water storage technologies; 3) direct contact is the most important and effective form of marketing strategy; 4) rate structure is a very important element of a marketing program and it is a strong determinant of the type of system (such as partial vs. full storage systems that would be installed); 5) a sales team must have multidisciplinary training; 6) testimonials and site visits are effective strategies for specifiers; 7) specifiers

view information from non-utility sources as being more influence; and 8) providing a feasibility study helps get a decision made.

San Diego Gas and Electric Case Study. San Diego Gas and Electric (SDG&E) developed thermal storage marketing program to reduce peak loads, help retain loads in face of competition, increase off-peak sales. The goals for this program is to obtain 10 MW of thermal storage capacity per year.

SDG&E's marketing program consists of specifier seminars, active lead prospecting, and direct sales calls to developers, owners and specifiers, as well as monthly newsletters, preparation of preliminary feasibility studies and financial incentives.

The results of the SDG&E program to date include over 20 complete installations, accounting for 4.7 MW of installed capacity, 27 other projects under construction, accounting for 11.6 MW of capacity.

Lessons of experience from SDG&E include: 1) marketing efforts must have senior management support; 2) marketing efforts must be flexible and able to get decisions made to negotiate in good faith with customers; 3) sales representatives need to have technical and sales skills; 4) there should be a well thought-out marketing program; 5) it is essential that you talk to the customers about their needs and desires; 6) it should include marketing staff with experience in marketing in the private sector; 7) a dedicated and experienced staff improves the results; 8) one must understand and practice the concepts of relational marketing, that is, maintenance of on-going relationships based upon mutual respect, trust and credibility; and 9) it is helpful to have a marketing strategy session to develop a marketing plan before the program starts.

Attributes of Successful Commercial Thermal Storage Marketing Programs. Let's briefly review the common threads of successful marketing programs, to see if we can ascribe the attributes of a successful program.

First, staff members of the utility or company must have a belief in the product or service that they are trying to sell. There is nothing new here, but enthusiasm for your product is contagious. It is an essential ingredient to getting the customer enthused about the concept.

Along with belief comes commitment. Commitment operates on several levels. Commitment to the company and it's products or services -- the firm belief that "we have a good company and a good product" -- lays the groundwork for a successful marketing effort. It is also a commitment that "we will go out there and spend the time and the effort that is needed to satisfy the customer's requirements."

Credibility is probably one of the most important single elements for successful marketing. We are asking customers to make major capital

investments. The credibility that is required to motivate people to make major capital investments does not come easily. It is often a result of a long-term relationship, where you have worked with the customers, and have established that you can provide credible information and that you understand and are concerned about his or her problem.

Threat contact and active marketing both owners and specifiers is required. Owners and specifiers are daily bombarded with advertisements about products and services that will significantly reduce their energy costs if they just sign up. To get through and be seen and listened to, one has to think about talking directly with these people. Also, make sure your message is given its proper weight as factors such as commitment and credibility, discussed above, come into play.

Multiple and ongoing efforts are required to successfully market thermal storage. What do we mean? We mean that a marketing program cannot consist of just direct contact, just newspaper advertisements, or just incentives. One cannot offer incentives for thermal storage systems and not tell anyone about it. Obviously, no one would participate in such a program and the incentives would be very ineffective, even though they may be very generous. More importantly, one has to recognize that there are many stages of decision-making. Stages include need identification, information search, weighing of alternatives, decision-making, implementation and, finally, feedback and satisfaction with the decision. It is important to have strategies that provide appropriate types of messages for the different decision-makers in these different stages. In addition, as we discussed earlier, there are multiple parties in decision-making processes and each of these can exert a tremendous amount of influence over what alternatives are selected. Therefore it is necessary to have different kinds of marketing messages and efforts targeted to these different factors.

The marketing staff must be out on the streets actively generating prospects, identifying existing buildings where heating, ventilation, air conditioning, (HVAC) systems need to be replaced and new construction projects well before they are designed. This is essential, because there are literally dozens of firms out there marketing and trying to sell alternative HVAC concepts. In addition, many HVAC decisions are made very early in the design process. If one waits until the public announcement of a project, it is frequently too late to have any significant impact on the type of HVAC equipment that is selected.

One of the lessons that comes through loud and clear in these case studies is that the most successful thermal storage marketing efforts are part of sustained, on-going marketing efforts. There has been a relationship built up over the years between the utility, building owners, and the design community. This relationship is the foundation of trust and credibility that facilitates the consideration and adoption of new

technologies that the utility may desire to promote.

A successful thermal storage marketing organization should have somebody clearly identified who has authority and the responsibility to meet goals and has some explicit goals for the marketing program. These goals should state what should be accomplished and how the effort will be evaluated. A person with the responsibility also needs the authority to hire, direct and manage staff as he or she sees fit to achieve those goals.

Finally, the staff of all of these successful marketing efforts should have good technical skills and sales skills. All of the programs we examined have been explicit in training in both skills of selling and engineering skills.

It is kind of interesting to look at these common attributes of successful thermal storage marketing programs and to compare them with what has been said in management textbooks about successful marketing programs. For example, in the June 20 issue of The Wall Street Journal, Mark McCormack summarized what he feels makes a great salesperson. Mr. McCormack says that the "prerequisites for any good salesperson includes belief in the product and oneself, a good sense of timing, a good sense of humor and an ability to realize the customer isn't necessarily telling you what he wants." He further says that "beyond these self-evident truths of salesmanship there are few strategies that make for super salespeople. These include knock on old doors, make your obsession their obsession (enthusiasm), bring something new to each party (change your marketing message as people move through the decision process) and remove objections gently."

We have seen that thermal storage can provide significant benefits to both electric utilities and commercial building owners and operators. There are significant hurdles to adoption of this technology, but we are seeing increasing acceptance of this technology. We have seen that the utilities can be a major factor in increasing this acceptance, if they follow a few basic principles of good marketing.