

MARKET TRANSFORMATION FOR SOLAR COMMERCIAL/INSTITUTIONAL APPLICATIONS

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ABSTRACT

Market transformation for solar energy systems is gaining increasing importance as we enter the second decade of green building practice, using the formation of the U.S. Green Building Council (USGBC) in 1993 as a timeline. A survey using a database of about 2700 green building advocates and practitioners revealed a variety of methods used for marketing solar energy systems, as well as some of the challenges faced in the marketplace. Theoretical approaches to marketing innovative technologies provide guidance for practitioners and advocates to expand the market rapidly.

It appears that marketing has and will continue to have much to do with the acceptance and use of the LEED™ system. This paper presents elements of marketing theory that might be applicable to the issue of “mainstreaming solar energy systems.”

1. THE SURVEY

1.1 Survey Design

In July of 2003, the author conducted a survey of 2700 people who attended the first US Green Building Council annual conference and exposition in November 2002 in Austin, Texas, using a web-based survey tool from www.zoomerang.com and a 20-question survey instrument of his own devising. We eventually received 473 responses or about 17% of the total universe.

1.2 Survey Participants

Survey participants came from a range of disciplines and occupations, including 35% architects, and 25% other design team members and contractors.

In terms of measurable experience, 73% of survey respondents characterized themselves as “very experienced” or “somewhat experienced” in sustainable design.

1.3 Survey Results

Participants were asked to choose one or more responses to characterize how their firm has responded to the market.

TABLE 1: RESPONSE TO THE EMERGING MARKET FOR SUSTAINABLE DESIGN SERVICES

	Percentage of Total
An effort to LEED-certify at least one project	59
Created new marketing materials	56
Rely on in-house experts	53
Hire outside experts	27
Create a new division/profit center	12

Firms that were more committed to sustainable design had a tendency to try to LEED-certify a project, create specialized marketing materials, create a new division and to hire outside experts. Less experienced or committed firms were more likely to engage primarily in staff training and to work with existing clients on LEED-related projects.

Survey participants were asked to describe the most effective methods for marketing sustainable design services.

TABLE 2: MOST EFFECTIVE MEANS FOR MARKETING SUSTAINABLE DESIGN SERVICES

	Percentage of Total
Successful projects, with LEED certification goal	37
Networking or speaking	18
Direct selling to interested prospects	12
Successful projects, without LEED certification goal	9
Public relations	8
Writing articles	6
All others	9

The most effective marketing means reflects the desire of building design professionals to let successful projects be their preferred marketing approach, which also reinforces the effect of networking, speaking and writing articles.

Of our survey respondents, 76% said that they had been able to attract new clients or projects based on their expertise. This result points out the role of developing expertise, project experience and a recognizable “name” in the early stages of a new market. In addition, 65% of our survey respondents felt that this expertise had helped them to retain existing clients, and 79% reported that this expertise and reputation had definitely helped them differentiate their firm in the marketplace.

Of our survey respondents, 83% reported having attempted to sell clients and/or those in their organization on the virtues of using LEED on a particular project. This point out the important role that developing internal expertise plays in convincing building professionals to “stick their necks out” and become advocates.

In responding to this question about perceived barriers, Table 3 shows that our survey respondents gave more weight to first cost increases, found LEED projects harder to justify and found that the market was not willing to pay a premium for sustainable design.

TABLE 3: PERCEIVED BARRIERS TO INCORPORATING SUSTAINABLE DESIGN AND LEED

	Percentage of Total
Adds significant costs	78
Hard to justify, costs or otherwise	47
Not comfortable with new ideas/technologies	39
Market not interested	24
Other reasons	30

Our survey respondents still found it hard to justify to clients, meaning that they were unable to connect their own interests with the project goals of their clients, and they found that the market was very uncomfortable with what might be involved in sustainable design. This suggests in some ways that incorporating sustainability and integrated design into the basic practice of a firm (“if you hire us, you get the following green measures, no discussion, no argument” approach) might be more effective to help firms differentiate themselves in the marketplace.

TABLE 4: MORE EFFECTIVE PROMOTION, TO EFFECTIVELY INCREASE COMFORT LEVEL OF CLIENTS

	Percentage of Total
Case studies of successful projects	43
More independent cost information, in conventional formats (such as R.S. Means)	61, 67
More training	28
More project experience	48
More successful local projects (ours or not)	43
Greater Life Cycle Analysis (LCA) of products	N/A
Better marketing materials	N/A

Our survey respondents gave more weight to independent cost information and less weight to case studies and more training. In their comments, many of our survey respondents focused on the need for performance and post-occupancy evaluations, and a reduction in the costs of certification.

2. SOME THEORETICAL TOOLS

2.1 Diffusion Theory

Classical diffusion theory, now more than 50 years old, has been summarized by Rogers in *Diffusion of Innovations* (9) and is widely known among marketers of new technologies. Basically, it posits a group of five distinct types who adopt innovations in different ways and at different times. Table 5 shows these distinctions. This theory also posits a “normal distribution” of innovation adoption, with a mean time to reach 50% of the available market of typically 10 years or more.

TABLE 5: CATEGORIES OF RESPONSES TO NEW TECHNOLOGICAL INNOVATIONS

	Percentage of Total	Characteristics
Innovators	2.5%	Venturesome
Early adopters	13.5%	Respectable
Early majority	34%	Deliberative
Late majority	34%	Skeptical
Laggards (or “nevers”)	16%	Traditional

As might be expected, the major issues in determining the rate of adoption of innovation include:

- relative advantage (still being debated for green buildings)
- compatibility with existing methods (generally this is the case for sustainable design)
- ease of trial at relatively low cost (not the case for new building technologies)
- observability by those who would try it (this is definitely the case for green buildings)
- simplicity of use (which LEED and sustainable design are not, at this time).

Of these five factors, *relative economic advantage is the major driver of response to innovation.*

According to Rogers, there are four overall key factors in determining the rate at which an innovation will spread from the relatively small innovator segment that welcomes new things, to broader segments that are far more risk averse and intolerant of ambiguity.

- The nature of the innovation itself, including its relative advantage
- Communications channels used by subsequent market segments
- Time required for the decision to innovate, the process of adoption to occur (including training in how to use the innovation) and additional adopters to learn about it
- Social system in which the innovation is imbedded, particularly the social barriers to innovation.

At this time, LEED has gained perhaps 10% or more of the institutional market for new buildings but scarcely 2% of the corporate market (BD&C, 2003, at p. 38). So, for the private sector market, the client base can be described as "innovators" and for the public buildings market, the client base is more likely of the "early adopter" category. Even in the public buildings client base, many project managers who supervise large projects could properly be characterized as late adopters, and will need strong mandates from upper management to accept sustainable design projects.

The relative advantage of green buildings and LEED has yet to be shown in either of these markets, given the demonstrably higher capital costs and certainly higher certification costs, compared with conventional practice. (1) (5). Certain benefits, such as energy savings, are already a standard part of conventional project "payback" analysis. Benefits appear greater for long-term owner occupants of buildings, but many of the reported and putative benefits are harder-to-measure "soft costs" such as employee productivity, improved morale, reduced absenteeism and illness. These benefits have relatively little acceptance among building owners and project financiers.

Anecdotal evidence of benefits is strongly in favor of green buildings, but it has not filtered yet into the general marketplace enough to overcome perceived cost hurdles. Since the green building market is "project based," it may take some time for perceived benefits to find appropriate projects, for a fuller implementation. Oftentimes, adoption of innovation is incomplete, for example, when a technology is acquired (in the way of desired outcomes such as LEED certification) but not deployed into general use; this phenomenon has been called the "acquisition gap" and has been found in a number of technology diffusion studies (3), wherein the authors observe that "knowledge barriers impede deployment."

In the light of the current state of the market, the survey respondents' desires for more independent cost and performance evaluations of green buildings are critical for building credibility and overcoming perceived barriers. In my own experience, the expectation of real benefits has to exceed the likelihood of increased costs by 25% or more to change most decisions in favor of new technologies or methods. Many studies of the psychology of decision-making have shown that consumers and clients are likely to resist change unless the perceived "downside" risk is heavily outweighed by a well perceived "upside" benefit.

If green building is to enter the mainstream of the "early majority", it must begin to take note of the problems of marketing new technology well illustrated in the classic "Crossing the Chasm," in which Geoffrey Moore (7) demonstrates how difficult it is to go beyond the early adopters to the more general marketplace, using the same marketing mechanisms and communications tools as for the smaller, more specialized and risk-tolerant group of innovators. The argument here is clearly on the side of simplifying the LEED tool, minimizing annual changes and feature updates, and addressing the risk-aversion of the early majority.

Gladwell's recent work (4) discusses how epidemics and fads spread, a topic of great relevance to the diffusion of innovation, especially in the areas of understanding the roles of communications channels and social networks. Basically he posits that innovations spread fastest through the work of a relatively few people who have well developed social networks; when they are "sticky" in terms of the emotional effect of memory, myth and metaphor; and when they are disseminated within a powerful context (almost a tribal setting) among people they know, trust and like.

In Gladwell's terminology, green building and solar energy adoption will spread most rapidly through the actions of well connected individuals (word of mouth spreads most fads); through people who widely and openly share their knowledge with others (experts whose judgment is trusted); and through "persuaders" who have the ability to tell compelling stories to others. In other words, innovations finally spread when good salespeople get involved. Green building and solar power have the first two categories in abundance, but the third in scarcity.

In the author's own experience, watching and participating in the diffusion of residential solar water heating technology in California from the period of 1977 through 1985, in spite of awesome tax and energy saving advantages and a relatively simple technology, *it was not until major sales organizations became involved that technology adoption accelerated*. Unfortunately, most design professionals are against selling their services *per se*. They are not very good at selling, either, in my experience, so that this lack of skill presents a major barrier to more widespread adoption of sustainable design and currently of solar power systems. There is of course a major sales cadre of vendors who somewhat make up for this gap, by selling specific hardware solutions, but they seldom influence the decision for or against specific green building or solar energy approaches.

Gladwell's work argues for continued efforts by the U.S. Green Building Council, the Solar Energy Industries Association, American Solar Energy Society and others to prepare compelling sales materials, document the factual case for green buildings and solar power systems, tell the green building and solar power story in memorable terms, and continue to document the stories of those who are moving the adoption of sustainable design forward. It also supports a renewed focus on chapters of 150 people (or fewer) who can build local support for green buildings.

2.2 Competitive Strategy

Most businesses use some variant of the theory of competitive advantage first introduced by Michael Porter of Harvard Business School about 25 years ago. Porter's classic work, *Competitive Advantage* (8) first laid out the three basic building blocks of competitive strategy used by most businesses today.

In his work, Porter basically outlines three approaches to winning in the marketplace:

- Differentiation
- Low cost
- Focus

In differentiating services, a business seeks to create a difference in the mind of a buyer, with attributes that *make a difference* to that person or organization. For example, we might want to be thought of as the "leading edge" firm or product category; that will limit our market, but sharply define us to buyers who value that attribute, namely the "innovators" of diffusion theory. In today's commercial world, a major task for service firms and for specific technology solutions is to create a *BRAND* that will incorporate those key differences.

Of course, we can create differences for each market segment that we choose to address, since some might value innovation, others low cost, others specific technological choices such as photovoltaics or roof gardens. The author argues that, almost without exception, there are no consumer "brands" in the solar energy marketplace today. Without a leading brand (and with due apologies to the major companies involved in this business), the average consumer will not want to make a purchase. Even in commercial situations, the lack of a brand can have drawbacks (for example, imagine the confusion in the commercial air conditioning market without major brands such as Trane® and Carrier®).

Low cost of operations gives a firm pricing flexibility. Given the tight budgets of many building projects in the U.S., the ability of solar power systems to compete on price (with low cost) is a valuable asset. These costs may be based on prior project experience, accurate product knowledge, good research or a willingness to "pay to get the experience". Recent work by Maycock (6) show a continuously declining unit price for PV panels and a grid-connected market that more than doubled between 2000 and 2002, with a projected doubling again between 2002 and 2005.

The ability to be creative with green building "value engineering" for energy and water savings, along with high levels of indoor air quality, might help an engineering firm to create far more valuable green buildings for the same fee as a more conventionally oriented firm. The ability to specify building-integrated PV would fall into the same category.

Low cost advantages might be more sustainable than even branding as a way to compete in the marketplace, but most firms don't have the discipline to operate in this fashion. As a good example of the competitive advantage of lower cost of operations, one can examine the almost unblemished success record of Southwest Airlines. For Southwest, the low prices made possible by lower operating costs have become their primary brand, along with "fun".

Focus is a key competitive strategy, knowing which markets to compete in and which to shun, knowing which clients a firm wants and which it doesn't. Focus can be combined with low cost or differentiation as a strategy.

Points of focus can include:

- Regional vs. National firm (many smaller design firms compete nationally by narrowing their focus to one target market, such as museums, libraries, zoos and the like); solar power dealers may certainly compete with a residential vs. Commercial focus, or local vs. national.
- Client types, which can include smaller clients, psychographic profiles (such as early adopter) or those distinguished by strong cultures and values of sustainability.
- Building types (or "vertical markets") such as office buildings, public service facilities (police, fire, jails), secondary education, higher education, health care, labs, cultural centers, retail, hospitality or industrial. Those building types likely to be impacted in the future by far higher peak period electricity rates, such as office buildings and institutional buildings (colleges, public agencies, etc.), might be very good candidates for solar power.
- "Signature" green measures, such as photovoltaics, Living Machines® or green roofs, that a firm commits to bring into play on each project.
- Project size can also be a focus, allowing smaller firms, for example, to "fly under the radar" of larger and more capable competitors. An example might be a focus on smaller retail stores or even green tenant improvements.

There is no one competitive response to the growing green building market that is "right" for every firm, as much has to do with the strategic clarity, capability, capital and character of the firm. Nevertheless, a conscious choice among strategies is vastly preferable to having none, for that assures only a steady diet of "crumbs" from the table of more decisive firms.

3. RECOMMENDATIONS

The following recommendations for green building and solar power advocates, while not surprising, follow from both industry surveys and from the well established theory of innovation diffusion. Only in 2003 was it recognized by architects that building-integrated photovoltaic systems, for example, can be part of a significant architectural statement, with award-winning projects such as Colorado Court in Los Angeles area, which won a national AIA Honor Award for a five-story high wall of PV panels (2).

The marketplace wants and needs:

- Case study data, with solid cost information, including initial cost increments.
- Comparative cost information within and across building types, as to the full costs of LEED certification, including documentation, and solar power applications.
- Demonstrable information on the benefits of green buildings and solar power systems beyond well-documented operating cost savings from energy and water conservation.
- Personal stories, by both practitioners and building owners, about the costs and barriers to completing LEED certified projects, especially those with solar energy systems/applications.
- Stronger use of multi-media approaches and other modern sales tools, to increase the emotional “bonding” with green building goals and methods on the part of stakeholders and final decision-makers.

Practitioners need to understand how their marketing must evolve in order to compete effectively:

- They must pick a strategy that incorporates high levels of differentiation or low cost, with explicit focus on particular market segments, that might include geographic, project type, owner type, Psychographic profile (e.g., early adopter, early majority), project size or even technological approach or “signature” green measures.
- This strategy must be reinforced to become recognizable as a “brand identity” of the firm and its specific products or services. Internal reinforcement includes training and certification as LEED practitioners, and external reinforcement includes activities to increase the visibility of the firm and its key professionals, including speaking, lecturing, networking and publicity for successful projects.
- Companies should consider developing their own proprietary tools, as part of a branding approach. Firms should also develop methods to execute LEED projects without additional design fees and to utilize all available state, federal and utility incentives for solar power applications.
- Architects and engineers must form closer working alliances with contractors and other project professionals to ensure that their designs will actually get built within prevailing budget, time, technology and resource constraints.

4. CONCLUSION

Survey results and practical experience suggest that green building and solar advocates and design professionals need to become aware of the theory of innovation diffusion and competitive advantage, if they are to successfully spread the message of sustainable design beyond the current group of “early adopters,” who are the primary market at this time in the institutional and governmental sector and the “innovators” who still dominate the green building market in the for-profit sector.

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