

Chapter 1 Introduction

The Department of Energy, Office of Building Technology, State and Community Programs, contracted with Innovologie, LLC, to characterize the commercial new construction market in order to better understand the needs and operation of this market, to more effectively identify technologies needed by the market, and to suggest ways to improve the effectiveness with which technologies are diffused to it. The commercial building market includes but is not limited to buildings used for offices, retail, healthcare, hospitality, public assembly, education, and worship. While the focus is the new construction market, information about the remodeling and renovation market has been included as well because, depending on the circumstances, it may be difficult to distinguish between these two markets.

The goals of this project are to identify:

- The types and kinds of new commercial structures that are being built and will be built in the short and long term
- The levels of commercial new construction activity by locale and by types and kinds of structures
- The number and size of players, including developers, owners, architecture and engineering firms, especially the major national and regional players
- The interactions among the players including patterns of association and information exchange
- The segments within the market where the players share similar patterns of decision-making, capital use, or technology needs
- The process by which new commercial building construction is completed and the forces at work within the process that influence the energy efficiency of buildings
- The individuals and firms within the market who are the leaders and who influence trends
- The forces at work that are changing the way players relate to one another and the way they make decisions
- The strategies that might accelerate and increase the acceptance of energy efficient technologies and whole building design concepts

Approach

As originally envisioned, the project was to complete a review of information from secondary sources and a set of interviews with key players in the market. However, because materials from secondary sources were much more extensive than was originally thought, it seemed prudent to use the available resources to analyze the secondary source material and postpone the interviews this work was completed.

This report is based on several kinds of materials. Some of the basic information about building types, sizes, and energy uses was drawn from the 1999 Commercial Building

Energy Consumption Survey (CBECS) completed by the Energy Information Administration (EIA), Department of Energy. Some of this information was drawn from published tables and some was developed from analyses of the CBECS public use sample. The CBECS survey is currently being updated by EIA.

Much of the information for this study was gathered from the Internet. A great deal of the information comes from surveys and information compiled by trade associations and trade publications. In some instances, private firms collect information and produce reports for an industry. These reports are produced annually or at some longer interval. Many of these sources of information have been available in printed format for a number of years but have not been widely known or available outside of the disciplines for which they were produced. Within the last three to five years this information has been placed on the Internet, which, with current search engine technology, makes it easy to locate and retrieve. Table 1 presents a selection of the sources used to this document.

Table 1 Sources of statistics from the Internet

Source	Type of data
National Real-estate Investor	Office statistics
Shopping Center World	Retail statistics
American Senior Housing Association	Housing for seniors
SIOR Comparative Statistics of Industrial and Office Real Estate Markets	Office statistics
International Council of Shopping Centers, National Research Bureau Shopping Center Database and Statistical Model	Shopping center statistics
Chain Store Age	Retail statistics
Chain Store Age/Leo J. Shapiro & Associates	Statistics about stores
BizStats.com	Business statistics
Census of Manufacturers	Food sales and service data
Census of Retail Trade	Food sales and service data
Census of Wholesale Trade	Food sales and service data
Census of Accommodation and Food Services	Food sales and service data
Prepared Foods Magazine	Food sales and service data
Technomic, Inc.	Data on restaurant chains
Progressive Grocer	Supermarket statistics
Food Marketing Industry Speaks 1992–2002	Supermarket statistics
National Association of Convenience Stores	Convenience store statistics
American Hotel and Lodging Association	Lodging statistics

Source	Type of data
Smith Travel Research	Lodging Statistics
AHA Hospital Statistics	Hospital statistics
Provider	Assisted living statistics
Health Industry Market Intelligence Database	Health statistics
Reed Business Information, a Division of Reed Elsevier Inc., 2002	Warehouse statistics
U.S. Department of Education, National Center for Education Statistics, Common Core of Data Survey	Educational statistics

There are several points to be made about this information. Many of the databases from these sources are based on surveys conducted by trade associations and rely on voluntary response and self-reported information. Not all firms respond to the surveys. Based on our experience in working with this information, it appears that the largest firms tend to respond while smaller firms do not respond or are not polled. We also point out that in some instances it may be to the respondent's advantage to over or under report information or to not report certain kinds of information. For the most part, the data from these sources seem relatively complete.

A second important point is that the information is collected for use by the trade association and its members. It tends to focus on issues of importance to them to the exclusion of other concerns. Thus, it does not always contain the level of detail about buildings or decision-making that we might like.

A third point is that the data reported on the Internet is a selected subset of the available information. Much more information is collected than is reported publicly in the publications and by the trade associations. Thus, there is potential to learn more from the data that has already been collected than is evident on the Internet.

We recommend that DOE examine the potential for using this information. This information may be available for purchase and/or DOE may be able to partner with these publications and trade associations to produce new information from the existing data. We believe that this is a rich resource that might allow DOE to track trends more closely and to develop a more in-depth understanding of these markets.

Finally, we examined a great deal of information from published reports and documents. For example, the futures chapter is based on a number of books and publications. This is true of the decision-making chapter as well. There is much more data and information that could be accessed with additional resources. We believe that this is a significant start in developing a more comprehensive understanding of the new construction market.

The organization and content of this report

Our original plan for this report was to do an overview of the buildings market and then to develop materials about each of several commercial building sub-markets. As we began to implement this plan we realized that most of the information that we had was historical. There was a certain temptation to project the future of commercial buildings based on our current understanding of buildings. However, as we examined these markets, we were reminded that there are many forces for change in our society that determine what buildings are built, where they are built, how the buildings are used once they are built, and how frequently they may have to be renovated or modernized.

If, for example, the Internet changes how we shop and how we meet for business, then it is useful to speculate as to how that might change the retail, lodging, and warehousing industries. If we travel less for business purposes because of web conferencing, perhaps the travel industry will focus more on leisure travel. If companies are using electronic networks to organize and improve the flow of goods, certain types of warehouses may become obsolete and others may take on new functions. Thus, rather than surveying the sub-markets and then discussing the future, it seemed better to start by examining the trends for the future so the trends could inform our examination of the various commercial building sub-markets.

Thus, we start with a chapter about the future that relies heavily on the work of futurists. Our purpose is not to project the future but to examine scenarios that highlight a range of options for what the future might hold. The intention is to provide a counterpoint to linear projections of what the future of buildings might be.

One of the main purposes of this document is to examine decision-making. Traditionally we have tended to think of the architect as the center of decision-making about new construction. In fact, there are numerous decision makers: the capital provider, the owner of the building, the user(s) of the building, the design team, the developer, and the contractor. A careful examination suggests that key decision makers are situation specific. In Chapter 3, we try to identify the situations and the factors that determine who makes decisions and the criteria that are used to make decisions across the range of situations.

Chapter 4 is an overview of what we know about the physical characteristics of the building market as a whole, the relative size of various submarkets, and an overview of what we know about energy use in buildings. Based on a look at energy intensity and the numbers of buildings in the various sub-markets, we selected seven sub-markets to examine in the chapters that follow.

As noted previously, one of the foci of this study is to determine who the players are and who makes decisions in the sub-markets. For each of the submarkets, we examine information about the number and characteristics of the buildings in the market and then we turn to a discussion of who the players may be. We also examine the energy technologies being used in the sector and the extent to which efficient technologies may have penetrated the market.

In the office sector, Chapter 5, we examine the differences between owner/users and owners who lease buildings. What emerges is a pattern that carries through several of the sub-markets. There are large national firms who own and manage large amounts of

property that lease that property to others and a much larger number of smaller owners who own and use their own property. Who controls the space has important implications for the strategies that are needed to promote energy efficiency.

In Chapter 6 on the retail sub-market, we examine three groups of players. Large developer/owners who lease space, large retailers who lease space, and retailers who own their own space. Large retailers who lease space have a great deal of control over the design and construction of buildings they lease. They are an important group of players who are probably best addressed at the national or regional level.

The food sales and service sector is quite complicated. In discussing this sector (Chapter 7), the food production and processing sectors are touched upon only briefly because they tend to be more industrial than commercial. There is a discussion of food wholesaling. Wholesalers are trending toward greater involvement in retail food sales as a response to the fact that the larger grocery firms are increasingly dealing directly with the processors and wholesalers.

The food sales and service chapter also examines consumer trends such as “takeout” meals and eating out and the impact these trends are having on food sales and buildings as well. There is a discussion of food sales from the perspective of grocery firms and convenience stores. A key trend is the growth of “supercenters” and wholesale firms such as Costco and the struggles of more traditional grocery firms to respond to these well capitalized and aggressive retailers. Supercenters and consumer warehouses are reshaping the landscape of food sales.

As discussed in Chapter 8, the lodging sector is interesting for several reasons. There is a high degree of concentration in this sector that takes the form of ownership, branding, and franchising. This has a variety of implications for the strategies for improving energy efficiency. This market is also changing with significant growth expected in the leisure side of the market. The leisure market has very different energy use characteristics than the travel market.

We read about healthcare on a daily basis in our newspapers. We sometimes deal with the healthcare system more than we would like. In Chapter 9 on healthcare, we see that how and where healthcare is delivered in the future is changing under pressure from health maintenance and preferred provider organizations that are trying to contain and reduce costs and from very significant changes in the scale and requirements of medical technology and drug treatments. The locus of medicine in the future is likely to be offices, clinics, or homes. The decline in the number of large hospitals will continue and the functions of hospitals will change. The outpatient sector of the healthcare system will grow with the demand for senior housing. Larger companies that are better capitalized and able to deliver better services are reshaping that part of the sector, which has largely been the province of small independent operators.

Warehousing is also changing. Traditionally, warehouses were designed for the storage of goods in transit. Just-in-time manufacturing and business philosophies that stress attention to core business practices are causing the warehousing sector to change its function from traditional warehousing to logistics. It is increasingly difficult to distinguish the end of the assembly line and the beginning of the transportation function. This has implications for warehouses of the future.

Finally, in Chapter 11 we examine the education sub-market. The education market includes K-12 schools and colleges and universities. It is fairly clear that computers and the Internet are changing the way K-12 and college and university education is delivered. The most substantial changes may occur in the post-secondary market where for-profit education, education delivered by employers, and on-line education may have significant impacts.

What will the future of commercial buildings be? Who will decide?