

1997 HOME BUILDER'S SURVEY

Conducted by Community Research Services, Illinois State University

1. EXECUTIVE SUMMARY

In 1997, Community Research Services, with sponsorship by Rural Partners Inc. and the Illinois Department of Commerce and Community Affairs (DCCA), conducted a survey of Illinois home builders for DCCA's Bureau of Energy and Recycling. This research on construction practices was conducted to support program planning for DCCA's energy programs including the Energy Wise Homes of Illinois program.

The 1997 Home Builder's Survey addressed:

- number, square footage, and price for single-family units;
- energy efficient materials usage and cost;
- energy efficient features requested by home buyers;
- company home design, financing, and sales practices;
- builders' perceptions of the importance to customers of specified home features; and
- company values and incentives for building energy efficient homes.

The Residential Construction Employer's Council (RCEC) and the McHenry County Home Builders Association supported the research by supplying builder names. In addition, RCEC covered the cost of mailing to their membership and the top 50 Chicago home builders. One hundred and thirty six builders were invited to participate. Twenty four usable surveys were returned.

Survey results indicate builders are driven by customer demand for energy efficiency in housing. Responding builders contend the price of building energy efficient homes is not great; but several commented it does not pay to build energy efficient homes.

Recommendations for program planning and future research include:

- Evaluation of user-friendliness of DCCA's Home Energy Rating System software.
- Development of curricula to educate builders and consumers about energy efficient building materials and practices.
- Conduct of additional statewide survey research about energy efficiency practices and information needs.
- Utilization of energy data collected by the National Home Builder's Association and the Department of Energy, Energy Information Administration.
- Examination of "growth" communities zoning laws and restrictions to determine efficiency of neighborhood infrastructure, i.e., amount of sewage, sidewalks, etc.
- Contact of building material manufacturers for product demand information.

2. INTRODUCTION

In 1997, Community Research Services, with sponsorship by Rural Partners Inc. and the Illinois Department of Commerce and Community Affairs (DCCA), conducted a survey of Illinois home builders for DCCA's Bureau of Energy and Recycling. This research on construction practices was conducted to support program planning for DCCA's energy programs including the Energy Wise Homes of Illinois program.

Energy Wise is a market driven Home Energy Rating System (HERS) whose goal is to "promote residential energy efficiency thereby making all housing more affordable" (Energy Wise Homes of Illinois brochure). The HERS could be used by homeowners or buyers, contractors, builders, and lenders to determine probable energy costs. The HERS determines energy efficiency levels through inspection and computer-based analysis of building components including:

- building materials, insulation levels, and window types;
- heating, cooling, and water heating equipment; and
- infiltration levels.

The 1997 Home Builder's Survey addressed:

- number of multi-family, single-family/tract, and custom units built in 1996;
- average square footage and unit price;
- insulation, duct, and air sealing practices;
- heating and cooling system usage;
- window types used;
- energy efficient features requested by home buyers;
- cost for energy efficient features;
- company home design, financing, and sales practices;
- builder's perceptions of customer-placed importance on home features;
- company values; and
- incentives for building energy efficient homes.

The survey was conducted with support from the Residential Construction Employer's Council and the McHenry County Home Builders Association. This report describes the research methodology and survey results and provides recommendations and conclusions.

3. RESEARCH METHODOLOGY

3.1 Survey development

Community Research Services and DCCA Bureau of Energy and Recycling staff generated the 1997 Home Builder's Survey instrument. Many questions were adapted from a previous DCCA Energy Efficiency Survey. New questions were developed to meet the needs of DCCA's Bureau of Energy. Input about survey questions and format was solicited from the Residential Construction Employer's Council and the McHenry County Home Builders Association. See Appendix 3 for a copy of the survey and cover letters inviting participation.

3.2 Mailing list development

The Residential Construction Employer's Council and the McHenry County Home Builders Association helped to generate a survey mailing list. The mailing list contained these organizations' builder mailing lists and Chicago's top 50 builders ranked by sales (*Chicago Sun-Times*, Friday, January 24, 1997). Thus, the sample comprised Northern Illinois and Chicago area builders. When recognized, duplicate builders and construction companies were removed from the survey sample.

The Residential Construction Employer's Council covered mailing costs for their membership and the Chicago top 50 builders. The survey was mailed to 136 builders in total.

3.3 Survey response

Twenty six builders responded to the survey. Information from two surveys was not analyzed because the surveys were from multi-family unit builders. Thus, results are based on 24 surveys for a response rate of about 17.6 percent.

3.4 Data analysis

Survey responses were entered and analyzed in SPSS 7.0 for Windows. Frequencies and means were generated for survey responses. An emphasis was placed on reporting raw frequencies (versus percents) in the narrative and in tables and graphs due to the number of returned surveys.

4. RESEARCH RESULTS

Results are presented in the following narrative and through figures (graphs and tables) in Appendix 1. A list of participating builders who agreed to be identified appears in Appendix 2.

4.1 Units constructed and cost

Half of the builders surveyed do not construct multi-family units. Eleven of the 12 multi-family unit builders constructed from two to over 100 such units in 1996. Over half (62.5%) of the respondents built single-family tract units in 1996; these units averaged 2850 square feet or less. Ten of 16 tract builders indicated average square footage of their units at 2000 square feet or less.

Eleven (45.8%) of the 24 respondents built from 1 to 100 custom units in 1996. Seven builders (29.2%) indicated they built no custom units in 1996; two builders (8.3%) indicated they do not build custom units; and four builders (16.7%) did not respond to the question. Of the 14 builders indicating the average square footage of their custom units, eight (57.1%) indicated average square footage of 3000 square feet or greater; six indicated unit average square footage of 1500 to 2800 square feet.

After asking builders for types and numbers of units produced, the survey asked builders to consider only single-family housing units when answering questions. Builders indicated the percentage of single-family units their company builds in six price ranges. Only one builder builds up to 20 percent of total units produced at a price under \$100,000. Another builds 100 percent of units in the \$100,000 to \$149,000 range. Five builders construct up to 40 percent of units in the \$100,000 to \$149,999 price range. Eight to nine builders construct up to 40 percent of their total units in these price ranges: \$150,000 to \$199,999 (nine builders); \$200,000 to \$249,999 (nine builders); \$250,000 to \$299,000 (eight builders); and \$300,000+ (nine builders). Three builders build 100 percent of units in the \$300,000+ range. (See Figure 2 in Appendix 1.)

Builder information such as the number of multi- and single-family units and the average square footage of single-family units also appears in Appendix 1.

4.2 Energy efficient materials and equipment

To gauge energy efficient practices, the survey asked builders about their usage of materials and equipment in single-family housing units.

4.2.1 Insulation types and inches used in building components

Respondents indicated the type and inches of insulation used in building components.

An equal number of builders (4 respectively) indicated using fiberglass bats and blown fiberglass in attics. The remaining 16 builders said they use both fiberglass bats and blown fiberglass in attics. Nine builders (39%) use 8 to 9.25 inches of insulation in attics; another eight use 10 to 10.4 inches of insulation; the remaining six (26%) who answered the question use 12 to 14 inches of insulation in attics.

Most builders said they use fiberglass bats in cathedral ceilings, walls, and floors over unconditioned space (21, 23, and 15 builders respectively). Builders varied from using 5.2 to 12 inches of insulation in cathedral ceilings. The majority of builders, 13 (56.5%), use 3.5 inches of insulation in walls. Seven builders (30.4%) do not insulate floors over unconditioned space.

Six builders insulate basement walls with 1.5 to 5.2 inches of insulation. Fiberglass bats and other types (not specified) of insulation are most often used. Thirteen builders (59%) indicated they insulate crawlspace walls with fiberglass bats or other types of insulation; they most often install two to 3.63 inches of insulation in crawlspace walls although one builder indicated using six inches.

4.2.2 Ducts, air sealing methods, and windows

The majority of respondents (83%) most often use duct tape to seal air ducts. One builder uses metal tape and three other builders do not seal ducts. Nearly all respondents (23) install double pane windows most often. Only one builder indicated using double pane with low-e coating and argon gas.

Most builders (17 builders or 71%) use air sealing methods such as house wrap or sealing around attic penetrations in all units they produce. Six other builders indicated using such methods in some percentage of units produced. The remaining builder does not use air sealing methods.

4.2.3 Heating and cooling system types and efficiency ratings

Survey respondents indicated the percentage and types of heating and cooling systems they use in single-family housing units. Twenty three builders install natural gas furnaces in 91 to 100 percent of new construction while another builder indicated using natural gas furnaces in 71 to 80 percent of new units. Two builders install propane furnaces in 1 to 20 percent of new construction. No other types of furnaces are being used by builders responding to the survey.

The average level of efficiency (AFUE) of natural gas heating systems being installed ranged from 78 to 100. Almost half of builders (11 or 45.8%) use systems with AFUE of 80. The other builders were dispersed over the AFUE ratings: five use systems with AFUE between 81 and 88 and five use systems with 90+ AFUE.

Only nine builders indicated they do not install cooling systems in 1 to 30 percent of units they build. No builder indicated using electric room air conditioners. Most builders solely use either electric central air (14 builders) or central air (gas) systems (7 builders). Three additional builders indicated using electric central air without indicating central air (gas) system usage. The majority of builders (14 or 66%) use electric central air systems with average efficiency rating (SEER) of 10; five others use systems with SEER of 12; and only two use systems with SEER 14 and above.

Although builders tend toward energy efficient heating and cooling systems, most (20 builders or about 83%) do not consider a home's orientation to the sun when they determine its site.

4.3 Energy efficiency supply and demand

About half of the builders listed types of energy features home buyers request. The following table shows requested features and the number of builders specifying each feature.

Energy Features	Number of Builders
low-e glass	2
storm windows	1
insulation upgrades	4
exterior house wrap, e.g., Tyvek	5
visqueen moisture barrier	1
high efficiency heating systems, e.g, 90+ AFUE	5
high efficiency cooling systems, e.g., 12+ SEER	3
time clock thermostat	1

The majority of builders (13) surveyed said their companies offer energy upgrade packages. Builders then estimated the cost to build a house with premium or highly energy efficient equipment or materials. Most (17 builders or 77.3%) said the cost is between \$1,000 and \$2,499. Several others (3 builders) estimated a cost between \$2,500 and \$4,999 for energy efficient materials.

4.4 Builder home design, financing, and sales practices

Builders were asked about company practices regarding the design of homes, financing and energy efficient mortgages, and sales. Of the responding builders, half said their companies most often work with a designer (architect, design firm, etc.) to design homes. Five builders said the company most often builds to the customer's design specifications while another three said contractors typically impose designs.

All responding construction companies except one (23) use in-house sales staff to sell homes. Of companies using in-house sales staff, 15 also use realtors and eight use other sales methods. Two additional builders solely use realtors or other sales methods.

All companies indicated they leave the choice of lender to customers although over half (14 builders or 58.3%) said they have specific lenders with which they prefer to work. Builders were then asked about their awareness of energy efficient mortgages. Seventeen (77.3%) of 22 responding builders were unaware and only one builder thought availability of such a mortgage helped to sell homes.

4.5 Builder values and energy efficiency incentives

Builders gave their perceptions of the importance of home features to customers. These factors are mean ranked from most to least important in the following table.

Factors	Builder's Perception of Importance to Customers (1=most important to 6=least important)	Mean Rank
Location of home	1	1.91
Purchase price	2	2.22
Interior home design	3	2.71
Exterior home design	4	3.68
Resale value	5	4.81
Cost of utilities	6	5.76

Three other builders ranked an “other” category and specified school systems, amenities, and size of home as important to customers.

When asked to select the three items most important to their company during a construction project, 21, 19, and 17 builders respectively chose customer satisfaction, materials cost, and a high quality product. Six builders chose compliance with regulations as one of three items most important while only two builders said energy efficiency is most important during a construction project.

Although energy efficiency did not rate as an important item during a project, half of the builders said company employees are trained about energy efficient building equipment, materials, and practices. Two others said they did not know what training the company offers. Only four indicated their companies plan to increase efficiency in homes being built in the future. Another six did not know. The following table contains comments explaining answers to the question, *Is your company planning to increase energy efficiency in the homes it builds?*

31. Is your company planning to increase energy efficiency in the homes it builds?	If you answered Yes to 31, in which respects? If you answered No to 31, why not?
YES	Always aware of product lines & better built homes—we are a “pink panther builder” & have been since 1981.
YES	Exterior basement wall insulation.
YES	HVAC System; Insulation
YES	To address customer’s inquiries. Offer “packages” at various cost levels for buyers.
NO	We let market tell us level of interest in energy efficiency. Right now, energy cost is low. People not “into” extreme option—especially when payback is many years out.

Table continued

31. Is your company planning to increase energy efficiency in the homes it builds?	If you answered Yes to 31, in which respects? If you answered No to 31, why not?
NO	Our market does not demand or even ask for it.
NO	Clients seem to be quite happy with utility costs/bills.
NO	We are already building to a higher standard than the competition (R38 ceiling & R16 sidewalls).
NO	Presently doing more than required or expected by Purchasers.
NO	Only if the market dictates. It would be a function of the customers needs and competition from other builders in the same market area.
NO, NOT AT THIS TIME	The cost of increasing the efficiency at this time doesn't pay in the long term.
NO	Cost of building is too high now. Doesn't make more sales.
NO	Know the current products on market and availability/cost. Customers are not interested in additional cost of energy efficiency when most [comment ended].
NO	Because we now use 92% efficient gas furnaces & I do not believe it helps us in marketing.
DON'T KNOW	Need more info. on energy efficient items.
DON'T KNOW	Only standard knowledge of construction materials—No formal training through our company.

These comments point to customer demand as the most important factor in building energy efficient housing; many builders do not experience a demand for energy efficiency at this time. There are a few builders, though, who would like more information about energy efficient materials before specifying company plans to increase energy efficiency.

What would induce builders to construct a highly energy efficient house? Twenty two of the responding builders (91.7%) again reported customer demand would induce them to build an efficient house. Between one and three builders selected other inducements including recognition by peers/community as an energy efficient home builder; National Association of Home Builders Energy Value Housing Award; and Governor's energy efficiency award. Three builders selected "other" and specified: "energy crisis"; "we already do all of the above"; and "confidence in housing systems."

Two builders made the following comments:

Builders, as myself, should have special recognition for the fact that "we" care about our customers—publications should spell this out. Builders that care—make a difference and you should know who they are—not by the groups they belong to—but on their own merit--[name of company] puts the \$\$\$in your home—not their pockets.

Any designs that could be uniform or standard to the industry would be great. Also, energy conservation [should] address the need to recycle in our industry. I would be interested to survey levels of commitment to recycling.

5. CONCLUSIONS AND RECOMMENDATIONS

It is obvious Northern Illinois and Chicago area builders are driven by customer demand for energy efficiency in housing. Responding builders contend the cost of building energy efficient homes is not great; but their perception is it doesn't pay in the long run. A few builders need more information about energy efficient materials and practice.

Recommendations for program planning include:

- Evaluation of HERS software, i.e., user-friendliness and time necessary for data input.
- Development of curricula and programming to educate consumers about energy efficient building materials and practices so they can make informed choices to create comfortable and cost-efficient homes.
- Development of curricula and programming to educate builders about energy efficient building materials and practices and the cost and benefits so they can inform consumers of building options.
- Development of marketing materials associating energy efficient building standards with good customer service.

Because the sample was small, additional research on energy efficient materials and practices is warranted. Research should assess current practice and knowledge regarding energy efficient construction, assess builder desire for educational programs, and identify appropriate educational and marketing approaches. Specific research recommendations include:

- Conduct of additional statewide survey research. The Illinois Home Builders Association may support such a study through provision of builder contact lists.
- Utilization of National Home Builders Association energy data.
- Utilization of the latest results from the Residential Energy Consumption Survey from the Department of Energy, Energy Information Administration. Data collected in this survey include housing and household member characteristics and energy consumption and cost data. The Energy Information Administration reports data for four U.S. regions.
- Examination of "growth" communities zoning laws and restrictions to determine efficiency of neighborhood infrastructure, i.e., amount of sewage, sidewalks, etc.
- Contact of building material manufacturers for product demand information.

- Development and testing of public information, builder education, and marketing programs to encourage demand for and application of energy efficient home construction practices.