Summary of Findings on New Construction Training Offerings

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EXECUTIVE SUMMARY

Introduction

This report provides a summary of research conducted on behalf of Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, and Southern California Gas Company.[1] A series of in-depth interviews was conducted with a variety of actors in the residential new construction market. The first set of interviews, hereafter referred to as the "participant" research, was conducted with firms who have participated in training sessions provided by these four utilities. A second set of interviews, hereafter referred to as the "nonparticipant" research, was conducted with residential builders who have not taken advantage of utility-sponsored efficiency training.

The broad objectives of this research were to:

- document how the residential new construction markets are addressing new requirements in the Title 24 code for residential energy efficiency, as required under AB970, and
- identify program opportunities for future training in this area.

This study is organized as follows: Section 1 provides an overview of the approach to the participant interviews. Sections 2 and 3 provide the findings from the participant research: Section 2 focusing on overall findings on the impact of energy concerns on business practices and Section 3 providing feedback on specific training workshops provided by the utilities. Section 4 describes the methodology for the non-participant research, followed by a discussion of the findings in Section 5. Section 6 provides analyses comparing participant and nonparticipant characteristics as well as some further analyses of key population groups. Finally, Section 7 provides recommendation on training and related activities that the utilities may want to consider for the future.

The findings of the participant research are based upon a series of in-depth interviews conducted with (1) residential builders, (2) sales agents working for residential builders, and (3) architects and HVAC contractors who work in residential new construction. In total, 46 interviews were conducted in April and May of 2001.

The findings of the nonparticipant research are based upon a series of 33 in-depth interviews conducted with builders that are constructing homes in the PG&E, SDG&E, SCE, and SoCalGas service areas. These nonparticipant

[1] Throughout this report, these companies are referred to as PG&E, SDG&E, SCE, and SoCalGas, respectively.

interviews were conducted during June 2001, and the subject matter of this research paralleled that of the participant research.

The major findings outlined below provide a representative profile of the status of California's residential new construction market and its receptivity toward utility-sponsored energy efficiency training.

Findings

Conditions in the Residential New Construction Market

Present market conditions have created a somewhat greater demand for energy efficiency in new homes. Before and during these interviews (conducted during the first half of 2001) there was substantial uncertainty in California's energy markets, including rolling blackouts during the month preceding this research. As a result, there was a substantial amount of interest in energy efficiency among the interviewees, and most expect that the interest in energy efficiency among consumers shopping for new homes will only increase in the near term. Nevertheless, the feedback from our respondents illustrates that there are divergent opinions on whether consumer interest has increased to the extent that homebuyers are willing to pay for additional efficiency features.

Training participants seem more predisposed to view efficiency upgrades as being beneficial to home sales, and they were more likely than nonparticipants to be planning to add efficiency features to their new homes in response to increased consumer interest in energy issues. Nonparticipants were nearly twice as likely as participants (58% vs. 30%) to say that no such changes were planned. The findings of this research suggest that there is a noticeable division in the builder population with respect to the importance placed on energy efficiency, and that recent participation in RNC training is linked builder interest in using efficiency measures in new homes.

As a group, smaller builders are slower to make changes in response to shifting market conditions than are larger builders.[2] Smaller builders were nearly twice as likely as larger builders (72% vs. 38%) to indicate that they were not planning to incorporate new efficiency features in response to consumer demand. Furthermore, small builders were three times more likely than larger builders (29% vs. 8%) to indicate that they did not know what changes they would make in response to code changes. This slower response seems to be linked to both information barriers and resource issues.

[2] Larger builders were defined as firms indicating they construct in excess of 200 homes per year.

Consumer knowledge of efficiency choices is spotty. Consumer awareness of efficiency measures in new home construction is reported to have increased somewhat, but seems to be fragmentary at best. It is reported that many consumers are lacking in specific knowledge of the benefits associated with most efficiency measures. This perception was the driver behind a widespread base of support for greater utility education of consumers on energy efficiency features.

Awareness of Code Changes

Awareness of changes in the Title 24 residential code requirements was fairly strong. Ninety percent of builders and residential contractors report they are aware of the fact that the building code requirements regarding energy efficiency are changing.

Within the residential new construction market, we found two populations that were less likely to be aware of the changes in Title 24 requirements. Smaller builders were twice as likely as larger builders (16% vs. 8%, respectively) to indicate that they were unaware of the changes. In addition, builders' sales agents were less likely to be aware of Title 24 changes than the builders themselves or their subcontractors.

While much of the building/contracting market is comfortable with present arrangements for addressing Title 24 requirements, there is a market segment that feels it would be beneficial if the utilities were to take a role in disseminating information on the code changes. At present, a large portion of the market uses outside vendors or consultants to address Title 24 requirements. Satisfaction with the assistance provided by current vendors is generally high. Even so, a sizable minority of respondents feels that the utilities could play a useful role in disseminating technical information on the new code requirements and options for meeting the requirement. Nearly one-third of the training nonparticipants would like to see the utilities help disseminate information on the new energy code requirements.

Perceptions of RNC Training

Utility training workshops are highly valued by a portion of the new construction market. Overall, utility training offerings were viewed very favorably by training participants. Individual courses were given positive ratings; in addition, many participants recommend that the utilities continue and/or expand their training in residential new construction. A number of participants desire on-going training from the utilities, both to keep abreast of product

introductions and advances in industry practices, and to provide consistent, quality training for new hires.

Both technical and sales training courses should be continued. The current course offerings appear to provide a generally appropriate mix of topics for this market. There is variation in the level of interest in sales-oriented versus technically-oriented workshops. Both types of training are valued and merit continuation. Additional technical topics were suggested by some respondents, generally focusing on technologies that are not yet in widespread use (*e.g.,* solar options, radiant roofing, advanced wall insulation options, and new product introductions).

Nonparticipants place less emphasis on employee training, in general, and especially less on energy efficiency training than firms who participated in utility sponsored training workshops. Nonparticipants were, as a whole, less likely to have sent employees to any training on energy efficiency topics than participants (30 % vs. 100%). Moreover, one-quarter of these nonparticipants (27%) indicated that they did not send staff to *any* kind of training during the prior year. A portion of this population may therefore be quite difficult to influence through training, suggesting that other informational support should be considered for this segment of the market.

The nonparticipants, as a whole, were ten times more likely to be aware of and to use the training sessions sponsored by state and local building association (CBIA) than were the firms who participated in utility-sponsored training workshops (60% vs. 6%). Interestingly, there is a group of nonparticipants that is interested in training, but this group appears to rely upon groups other than the utilities for their training needs.

Location of training workshops is an important factor influencing the use of available training. There is a nearly universal preference for proximal workshop sites. Some respondents indicated that the Builders Associations, for example, provides more convenient local training opportunities as a result of the proximity of their sites to the builder's offices. Proximity appears to be more important than scheduling, although both factors weigh into decisions that potentially disrupt normal work routines.

Perceptions of RNC Programs

Awareness of utility-sponsored RNC programs (Comfort Home, Comfort Wise or Energy Advantage Home) varies. This was another area where small and large builders differed significantly: small builders were more than four times as likely to be unaware of the RNC programs as compared to larger builders (37% vs. 8%).

Opinions regarding the value of RNC programs are mixed: some builders feel the programs are distinctly advantageous while others find they make little difference. Builder perceptions about the degree of marketing support that is given to the utility programs may partially explain some of these differences of opinion. The research also indicated a difference between participants and nonparticipants in this area. Whereas participants in the training programs were almost universally supportive of the utilities' RNC programs, more than one-third of training nonparticipants felt that energy efficiency programs had little impact on the new construction market. The research also found that the Energy Star Homes program tended to be viewed less favorably than the utility-sponsored programs.

Recommendations

RNC training should be continued, and opportunities to expand such training should be considered. Most importantly, it is recommended that the utilities continue to offer RNC training support to the residential new construction market. The quality of the instruction was praised and most participants urged the utilities to continue with their present training efforts.

There is interest among builders and contractors in having the utilities continue with the training now being offered because, with respect to course topics, it appears that a number of the needs identified by homebuilders and residential contractors are being met. Suggestions that were offered for additional training included: (1) products and materials available for meeting energy code changes, and (2) focused sessions on specific measures such as solar water heating, photovoltaics, and radiant roof insulation.

The Selection of locations for training classes should take into consideration proximity to the target builder's or contractor's business. One area where there is room for improvement is in the delivery of training services to areas that are remote from large cities or utility offices. Universally, builders and contractors indicated a preference for proximity to their own offices. Some respondents, whose firms were more removed from the utilities' offices, reported that they were unaware of either the RNC programs and/or the training workshop opportunities. The training initiatives will have a greater impact if the utilities can reach a larger geographic area.

Coordination with trade associations such as the California Building Industry Association (CBIA) may provide an effective means of reaching out to builders who are not presently involved with any of the utility-sponsored training efforts. Among nonparticipating builders, we found higher levels of awareness of the CBIA training offerings as compared to awareness of

the utility training. Additionally, the CBIA-sponsored training tended to be viewed favorably, and the local presence of the homebuilders' associations is an added plus. It does not appear that builders are now getting efficiency training from the CBIA, so utility efforts may well complement what is now offered by this key trade association.

Efforts at consumer education are needed to increase the overall effectiveness of residential new construction programs. Feedback from our interviews indicates that offering technical and sales training, alone, is not sufficient for advancing the promotion of higher efficiency options in the new home market. Frequent comments and suggestions addressing consumer education indicate that substantial barriers remain in this arena. Builders, architects, and contractors would all appreciate additional tools for marketing efficiency features to consumers. Additional handouts (or other marketing tools) that can be shown to customers during face-to-face discussions were of particular interest.

In addition to training, the utilities should consider the possibility of offering more direct assistance on Title 24 requirements to builders, contractors, architects and related professions. While the entire builder market does not require this assistance, there is a sizeable segment of the builder market that would welcome utility involvement in this area. Some of the options suggested by the respondents included: (1) providing assistance in identifying options suited to the new code requirements; (2) posting code-related information on a web site, or (3) providing plan review for architects and builders.

Title 24 consultants and HVAC contractors desire concise information. Persons who expressed a need for assistance in understanding Title 24 changes highlighted the need for simplicity (*e.g.,* prescriptive steps for complying, specific examples, and web-based information). These tools may be useful during training sessions, or as follow-up resources for participants.

Smaller builders appear to need more assistance in adjusting to code changes than do larger builders. This research found that smaller builders may be less agile in responding to changing market conditions. This finding suggests that the utilities may want to target some of the training and outreach to the smaller builders to assist them in incorporating energy efficiency into their business practice.

1. PARTICIPANT SURVEY: OVERVIEW AND APPROACH

This report summarizes research findings regarding how the residential construction markets are addressing California state energy efficiency requirements embodied in Title 24 and AB970, and the role played by several utility-sponsored training workshops in meeting information needs related to these code requirements. This research was completed for Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, and Southern California Gas companies [hereafter referred to as PG&E, SDG&E, SCE, and SoCalGas, respectively]. Information was collected from homebuilders, contractors, and homes sales agents who had attended training workshops conducted by these four utilities. These telephone interviews were conducted during April and May 2001.

1.1 Research Topics

The research with training participants explored:

- awareness of changes in code requirements
- expected impacts of code changes on business
- current practices used to meet Title 24 requirements, including outsourcing to subcontractors or Title 24 consultants
- adequacy of current assistance, and the desire for additional services
- general use of training workshops
- opinions on the training offered by the utilities and that offered by the California Building Industry Association
- recommendations for improving training
- awareness of, and participation in, energy efficiency programs
- perceived relevance of efficiency programs to their businesses
- suggestions for utility action to support trades in meeting AB970.

The interviews also addressed the effects of recent energy market volatility on the respondents' businesses including, but not limited to, changes in customer demand for energy efficient products, features, and services.

A copy of the interview guide appears in Appendix A.

1.2 Sampling

Sample for this research was drawn from attendance lists for several training workshops offered at the utilities, including: Builders Energy Code Training [BECT], Sales Agent training, Energy Advantage Home Program [EAHP], and specialized workshops offering training on HVAC and windows.

1.2.1 Summary of Sample Frames

The sample frames for this research were provided by the utilities. The material provided consisted of databases and/or sign-in sheets from the training workshops. The data reported here characterizing the sample frame for this research represent the amount of useful sample available from these lists after cleaning. The cleaning process removed a number of listings due to the following reasons:

- removal of duplicate listings
- removal of listings for individuals who were recruited but who never attended sessions
- removal of listings for offices that have closed
- removal of listings for utility employees or trainer employees.

Note that representatives from larger builders are being reserved for the subsequent in-depth interviews following this first round of research.

Table 1 reports the numbers of available sample, including both the number of attendees as well as the number of firms represented by these individuals. These tabulations include only sample points with identifying information for the workshop attendees; all listings without critical information such as names or phone numbers have been deleted. Thus the true population of attendees was actually slightly higher for some cells.

Table 1: Available Sample for Participant Research[3]

UTILITY	BECT	CHEERS	EAHP	SALES	HVAC	WINDOWS
SDG&E	10/10	2/2		35/1	4/3	11/7
SCE	14/4			13/4	25/16	
SoCalGas			137/103			
PG&E	25/15			10/10	155/106	

1.2.2 Sampling Approach

Our sampling approach aimed to distribute the number of completed interviews fairly evenly across training sessions and utilities. As Table 2 indicates, we endeavored to complete 48 interviews, distributed as follows:

[3] The first number in each cell indicates the number of individual attendees, the second number indicates the number of separate businesses represented.

Table 2: Target Quotas for Participant Research

UTILITY	BECT	CHEERS	EAHP	SALES	HVAC	WINDOWS
SDG&E	5	1	X	4	2	2
SCE	4	X	X	3	5	X
SoCalGas	X	X	8	X	X	X
PG&E	5	X	X	4	5	X

Certain cell quotas were difficult to meet as a result of the limited amount of sample available, employee turnover, business or office closings, disconnected phone numbers, and respondent refusals. As necessary, sample quotas were re-assigned to other cells, with the total number of interviews remaining constant at 48.

Table 3, below, summarizes the number of interviews completed.

Table 3: Completed Interviews for Participant Research

UTILITY	BECT	CHEERS	EAHP	SALES	HVAC	WINDOWS
SDG&E	6	1	X	2	2	2
SCE	4	X	X	3	3	X
SoCalGas	X	X	8	X	X	X
PG&E	6	X	X	3	6	X

1.3 Characteristics of Respondents' Businesses

Using data collected in the interviews, we have profiled the respondents in the participant research. Three types of firms were represented in the respondent population: homebuilders, HVAC contractors, and architects/designers. Summary statistics for each group are summarized here.

Architects/Designers : Number of Respondents = 2

Homes built per annum: Average = 9; range 5-12
Full-time employees: Average = 2; range 1-3
Years in Business: Average = 36; range 10-50

The firms represented in this group clearly are quite small and have a limited reach in the market. They tend to specialize in higher end custom homes. One

firm places great emphasis on cutting edge, energy efficient construction methods.

Builders: Number Of Respondents = 26

Homes built per annum:	Average = 369; range 2-900
Full-time employees:	Average = 75; range 3-200
Years in Business:	Average = 28; range 4-120

The firms represented in this group were substantially larger than those represented in the other two industries. The majority of the firms represented in this group produce spec-built homes as opposed to custom homes.

HVAC Contractors: Number of Respondents = 18

Homes served per annum:	Average = 730; range 5-2000
Full-time employees:	Average = 19; range 1-70
Years in Business:	Average = 29; range 6-90

The figures for homes served represent total business activity, both installation and servicing of equipment. Based on respondent feedback, new construction accounts for ten percent or less of the number of homes represented above.

2. PARTICIPANT INTERVIEW FINDINGS: MARKET CONDITIONS AND PRACTICES

This chapter presents information pertaining to broad market conditions. These topics include:

- Impacts of energy markets on business conditions
- Title 24 Issues
- Perspectives on efficiency programs
- Training practices and experiences in general

Experiences with, and opinions about, utility training workshops are discussed in Chapter 3 of this report.

2.1 Impacts of Energy Markets on Business Conditions

2.1.1 Effects of Recent Market Volatility and Supply Interruptions

At the time of these interviews, the effects of the energy crisis in California were becoming increasingly visible. All respondents were asked to characterize the degree to which recent energy market conditions had affected their businesses. Answers on this subject were very mixed. Overall, nearly half of the respondents [19 of 40] indicated little or no effect as yet, 16 had experienced a moderate impact, and 5 had experienced a significant effect on their business. Builders reported neutral or negative impacts, whereas three-fourths of [8 out of 11] air conditioning contractors reported positive effects on their business. This positive effect was not concentrated in the new construction market though, as the effect primarily had to do with accelerated equipment changeouts in existing homes.

According to our respondents, the types of impacts experienced were as follows:

- [13 of 38] saw greater customer interest in energy efficiency
- [4 of 38] had incurred increased costs
- [4] had experienced disruptions in business operations
- [3] were experiencing increased sales (of air conditioning)
- [1] was experiencing decreased sales (of new homes)
- [2] found consumers concerned over reliability and who was the power supplier of new homes on the market
- [9] did not identify specific impacts.

Characteristic responses included the following:

- “Every time there is a blackout we’re affected.”

- "Our overhead has increased. The energy situation makes planning more uncertain."
- "It's been expensive."
- "Our subcontractors' prices are increasing as a result of a pass-through of the higher energy prices."
- We've gotten many change orders from subcontractors. The costs from the trades have increased about 10%. This is increasing the cost to construct new homes."
- "It has hurt us a bit. The utility doesn't seem to have enough manpower under the circumstances. Scheduling is a problem. We couldn't get meters put in."
- "It has affected us quite extensively, in a number of ways. In our main office, during blackouts, 150 employees are unable to work on our network. Also, I manage our education for homebuyers and we are seeing more interest in energy issues."
- "We have had about twenty people ask whether our homes get their electricity from SCE. This is seen as a problem. People see DWP as being better."
- "We have seen an increase in requests for energy efficiency."
- "We are getting a few more questions from buyers about the energy bills they can expect. This gives me a chance to mention Comfort Home features."
- "It hasn't really affected us."
- "I haven't noticed an effect. I was busy before, and I'm still busy."
- "It's gonna be good this season. We're selling new air conditioning systems daily."
- "Business is really booming. People are upgrading to efficient air conditioning systems. The rebates are helpful."
- "Business has picked up. We're getting a lot of change-outs of systems."

Some of the respondents felt that the energy situation had yet to affect their business. Among these were some who thought that the price rises were yet to come. Others felt that the economic turndown and/or the increase in the cost of all building materials were major factors affecting the home building industry, and that energy prices were only a small factor in overall influence.

2.1.2 Trends in Demand for Energy Efficiency

When asked in particular about effects on consumer demand for higher efficiency options, opinions were again mixed: 26 of 40 responding participants had seen an increased demand for energy efficiency among their customers, while some [5 of 40] respondents were unsure if there had been a change. All respondents who had not yet seen such a change were anticipating increased

customer interest in energy efficiency in the future. Selected comments on this subject included the following:

- "People are talking about it. I'm not sure they're changing their purchasing yet."
- "We have definitely seen an increase in buyer interest in energy efficiency."
- "Yes, yes, yes [there has been an increase in consumer interest in energy efficiency]."
- "There is not a lot of interest in energy efficiency."
- "We have had a couple of requests."
- "We have not seen any changes yet. The economy has a greater effect on home buyers than energy prices."
- "More people are requesting higher efficiency air conditioning and duct testing too."
- "In new sales of [air conditioning], customers are more aware of efficiency. For example, twelve months ago it used to be all 10 SEER; 75% go for 12 SEER now."
- We have seen more interest in the last three or four months. Customers are requesting higher efficiency systems. They are more aware of the rebates for air conditioning from the utilities. They want to get the minimum efficiency required to get the rebate."

To some degree, there seemed to be a greater perception of increased consumer interest in energy efficiency among architects, builders of custom homes, and air conditioning contractors. Builders of speculatively-built homes were less likely to report that homebuyers were much more interested in energy efficiency. As reflected above, a number were seeing some modest increase in inquiries on the subject, but were not convinced that they were seeing noticeable changes in home buying patterns. Among those spec builders who emphasize energy efficiency already in their homes, there were two identifiable opinions. One opinion was that there was more interest in the efficiency features of their homes now. The other opinion was that things had not changed appreciably in their niche, that they were ahead of the competition in this regard, and that demand among their homebuyers remained roughly as it was before.

One HVAC contractor whose clientele is speculative builders indicated that this population "still is not going for higher efficiency. Cost is dissuading them. They are not looking at payback; they are going for low cost. They don't care about the efficiency of the air conditioning."

Another HVAC contractor discussed consumer behavior regarding gas versus electric equipment at some length. "On the gas side, some people are upgrading, some are not interested. Energy is often not the first priority. Price is

often more important in their decisions. For electric, customers are asking about the rebates for air conditioning systems. 'What is eligible?' Awareness of the rebates is pretty common."

2.1.3 Efficiency Features Desired by Consumers

Homebuilders and their sales agents were asked to characterize the type of consumer interest in efficiency that they typically encounter when marketing new homes. Several respondents [6 of 14] reported that when consumers inquire about energy efficiency, the questions are often generic in nature. Comments on this subject included, "They're not coming in with specific knowledge; they're seeing their bill go up and they're looking to be told what to do," as well as "They ask about anything to lower their cost [of utilities]." Another respondent noted, "Customers are willing to pay something for energy efficiency but they're not sure how much."

When the homebuyer's inquiries on energy features are more specific, the components most often reported to be of interest are windows, insulation, and the air conditioning or heating system. These responses were given by [6 of 14], [2 of 14], and [2 of 14] builders, respectively.

2.1.4 Changes Planned to Address Consumer Demand for Efficiency

Builders who had already seen increased homebuyer interest in efficiency were asked what changes, if any, they were making in response. Among respondents expecting increased consumer demand for efficient homes and equipment in the future, we explored what actions were planned to address the market's concerns. [6 of 20] indicated they were marketing the existing efficiency features of their homes, [6 of 20] indicated they had made little or no change in their practices, and [8 of 20] reported that additional efficiency features were being considered. The following actions were under consideration or planned for the future by one or more respondents:

- changes in HVAC systems [non-specific]
- more efficient windows
- increased insulation
- more efficient appliances
- more efficient heating systems
- photovoltaics
- Energy Star participation
- Comfort Home participation

One respondent replied, "We'll do whatever we need to do – it's a market-driven business."

Interestingly, solar applications seem to be making some progress at present. A few builders mentioned interest in photovoltaics, and one sales agent said there has been “a lot’ of interest among homebuyers in solar water heating.

Some air conditioning contractors indicated plans to alter their business operations as well. One respondent indicated that they expect to do more testing as well as more jobs on airflow and refrigerant charging.

2.2 Title 24 Issues

2.2.1 Outsourcing of Title 24 Responsibilities

This research investigated how builders and contractors are addressing Title 24 requirements in terms of whether or not they utilize outside assistance from Title 24 consultants or subcontractors. Our findings suggest that builders are more likely than trade contractors to outsource responsibilities for Title 24 conformance and plan review to someone outside their own firm. While not universal, a number of builders [13 of 21] do rely on outside assistance, most commonly from a Title 24 consultant [12 of 21]. The second most likely source of assistance came from trade subcontractors [7 of 21], most often air conditioning contractors. Both architects interviewed also rely on outside assistance, again split between Title 24 consultants and trade contractors. In contrast, none of the contractors we interviewed reported using any other firms to aid them in addressing Title 24 requirements.

Almost universally, firms that are now using outside assistance from either Title 24 consultants or subcontractors report being satisfied with the quality of the services received, and had no recommendations for additional assistance in this area. Firms that are addressing the requirements internally did express some interest in additional or more accessible information on the specifics of the new requirements.

2.2.2 Awareness of Changing Code Requirements

The majority of participants were aware that Title 24 standards were changing this year, but not necessarily aware of the specific changes coming. Overall, only ten percent of our respondents indicated that they were unaware that the standards were changing. Most respondents [33 of 36] reported they were aware that new standards were being implemented. Builders’ sales agents were least likely, as a group, to be familiar with the particulars of the pending changes. We found a substantial proportion of the respondents had specific knowledge of the proposed changes and/or were scheduled to attend training courses addressing this subject.

2.2.3 Anticipated Changes in Practices

Homebuilders and their sales agents were asked what effect the new standards would have on their new construction projects. Quite a few respondents could not say how their firm might change the homes they bring to market as a result of the new standards. Those who were promoting more efficient homes felt there would be little or no impact on their business. (A substantial percentage of this group was participating in either the Comfort Wise or the Comfort Home programs.) This group was split as to whether they would make no changes in their homes or whether they would pursue even more efficiency options so as to remain distinguished from their competition in this regard.

2.2.4 Need for Title 24 Assistance

Training participants were also asked whether they feel there is a need for utilities to provide some type of assistance regarding the new standards. The timing of this survey made it somewhat difficult to get useful information on this topic because, while respondents were aware that new requirements were about to go into effect, they had not as yet had to attempt to work with the new standards.

Many respondents indicated they could not say at this time. Among a certain percentage there is a feeling that there is a need for readily accessible information detailing the new AB970 requirements. Some comments offered on this subject include:

- "We could probably use better information, but I don't know what."
- "During the design phase, it would be nice to get a quick review of the plans. To get feedback like 'Do A, B, and C and it will be better for the energy efficiency of the house.'"
- "The new standards are very complicated. Prepare a simple matrix that shows 'If you do this, this will happen.' For example, going from a 4 inch wall to a six inch wall or the effects of different windows."
- "A website with the information on the new standards. Using the Internet is a dream. It would be really useful to have something accessible on-line."
- "We need the details. Do something to get us the details on AB970."

2.3 Perspectives on Efficiency Programs

2.3.1 Overall View of Programs

All respondents were asked their opinion on the value of utility-sponsored programs promoting efficiency in new construction, programs such as Energy

Advantage Home, Comfort Home, Comfort Wise, etc. Every respondent indicated that the utilities should offer programs of this sort, and felt that the programs could make an impact on residential new construction. This view held among nonparticipants as well as participants. However, there was a real difference between builders and contractors in their perceptions of how relevant these programs are to their own businesses. Contractors were much more likely to express doubts that the programs were directly relevant to them.

Two builders indicated they had looked at the Comfort Wise program and decided not to pursue it. After attending the program training, they each concluded that – at the time – the costs did not justify participation. Whether or not these decisions will be re-evaluated is unclear. The respondents gave no indication that they were actively considering program participation now.

2.3.2 Participant Views of New Construction Programs

Our respondents included four firms participating in PG&E's Comfort Home Program. Six respondents identified themselves as participating in Comfort Wise and another one indicated that his firm is participating in Energy Advantage Home. In addition, a few firms are considering working with the Energy Star program in the future. Among firms considering possible future program participation, the following is typical:

- "We do expect an increased demand for energy efficiency. We want to get ahead on that."

Participants in the Comfort Home Program had the following comments:

- "It was wonderful when they visited here and showed us how to market it. Everyone is interested in energy efficiency now. If it can produce a good house, it's good for sales."
- "I get quite a few more questions now from buyers on energy bills. This gives me a chance to mention Comfort Home."
- "We market our features like ducts, windows and insulation through Comfort Home. The program makes a difference, but it's not tremendous."

Respondents discussing Comfort Wise had the following to say.

- "Comfort Wise doesn't make or break the sale. Our reputation and location are key. Energy is becoming more important, but it is an added bonus."
- "Comfort Wise affects our marketing. Things labeled as energy efficient get attention. I expect this will be even more so now."
- "It has been a plus for us to be in Comfort Wise. We market the efficiency features of our home through Comfort Wise."

2.3.3 Recommendations Regarding New Construction Programs

All respondents were asked for suggestions regarding the new construction programs. The single most common recommendation focused on preparing materials for consumers. This desire was expressed across all industries, from builders' sales agents to HVAC contractors to architects. The respondents would value materials, such as handouts, explaining both how efficiency benefits the home and guidance on estimating how large the effects on the utility bills might be. Each of these requests was repeated in interview after interview.

More marketing was suggested as well. One respondent commented, "People don't realize the value of it yet. The commercials are starting to make an impression." There was also some interest expressed in additional training on the programs. For example, "It would help to have a rep visit our sales meetings."

Several respondents recommended that the utilities subsidize the higher costs for efficient features. Also it was advised that the utilities not interrupt or cancel programs, that they be consistent in having funding available.

2.4 Training Practices and Experiences

2.4.1 Practices and Perspectives on Training

All respondents were asked to characterize the amount and types of training made available to employees in their firms. Practices in this area varied quite a bit with respect to the number of seminars attended during the course of a year. By and large though, this population represented by attendees of the utility workshops is one that places value on training, seeing it as being of clear value to their employees and their business. Fairly commonly, these respondents expressed the opinion that the construction industry is ever changing, resulting in an ongoing need to participate in educational training in order to keep abreast of recent developments. More than one respondent indicated that they would be interested in whatever training helps keep them up to date.

When asked to identify what types of training were most valuable, respondents universally demurred, indicating either that all the training was of value or that the answer varied from department to department within their firm, preventing them from giving an answer.

2.4.2 Sources of Training

Sources most often used for technical training among air conditioning contractors were equipment manufacturers or utilities. Among builders, the

sources were more varied, including the manufacturers and the utilities, but also including sales training consultants and building trade workshops. When singled out for discussion apart from other training organizations, the utilities received high praise from these respondents on their training sessions.

3. PARTICIPANT INTERVIEW FINDINGS: ASSESSMENT OF TRAINING OFFERINGS

The following sections summarize findings for each of the types of training offered by the utilities pertinent to new construction, including:

- Builder Energy Code Training
- Home Energy Rating training
- HVAC training
- Energy Advantage Home training
- Windows training
- Sales Agent training

Class participants were asked to rate the workshops on a scale of one to ten and to provide some detail on their experiences. Where possible, respondents identified which elements of the training were most useful to them and described how the information was used in the course of their business.

Training classes offered by the California Building Industry Association (CBIA) were also rated.

3.1 PG&E Builder Energy Code Training

3.1.1 Rating of Training Class

Six respondents rated the PG&E Builders Energy Code Training.

On a ten-point scale, this class averaged a score of 7.6.
Individual ratings given to PG&E's BECT sessions were: 9, 7, 7, 10, 7, 5.5.

Reasons given by respondents for their ratings included:

- "It was highly informative. The instructor was good. I liked the slides and the handouts."
- "The class was good for the clarifications it provided, the information that was available."
- "I already knew some of the information."
- "It enlightened me on the importance of efficiency actions."
- "The class covered a lot of stuff that I don't have to deal with."
- "It was not specific to our business, which is heating and cooling."

3.1.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- The changing requirements of Title 24
- HVAC requirements of Title 24
- Looking at AC loads on a room-by-room basis for sizing AC equipment
- The discussion of the insulation factors and the results. "It was surprising how much improvement was gained for how little insulation was added."

Three respondents indicated that the course helped their firms to comply with Title 24. Two of these indicated that the class helped the firm to prepare for meeting the Title 24 requirements in an orderly fashion when the requirements were being changed. The third respondent indicated that they have incorporated the information in the contract specifications that they use.

Another attendee indicated that they used the knowledge gained in the class to check out their vendor's work.

One respondent mentioned using course information on jobs when sizing AC systems. This respondent indicated that they have added other considerations to their procedures for sizing AC equipment. For example, they now consider windows and other factors not considered previously.

3.1.3 Recommendations

Some respondents offered no recommendations other than to continue offering the classes. One respondent felt that the training could be improved by conducting it in the field rather than in a classroom setting. This individual's comments were as follows:

- "Have training available outside of the classroom setting. Or, if it must be in the classroom, have more physical examples. On-site training is more valuable because it provides a chance to see the variations that come up. For example with ducts."

Another indicated that the field testing provided is good and observed that the training was "done really well."

One respondent would like to see a listing of state-of-the-art conservation options. Their firm is interested in this from a marketing perspective and is looking for items they can offer that are not being offered by their competitors. A second would like more information on photovoltaic roof panels and a third suggested information on water conservation measures which also save electricity. Still another respondent mentioned that the handouts created for the Comfort Home program are very informative and would like to see more training on these types of conservation topics.

Respondents preferred to have the training workshops located near to their offices. One respondent indicated within a thirty mile radius was acceptable, but most respondents suggested that the training either be offered in their home town or at the center where they had attended the training previously.

Respondents offered few suggestions as to the time for training. One respondent indicated that summer is less busy than winter, when it would be more difficult to make the time to attend. Another indicated that the slow season is in the October – November period.

3.2 PG&E HVAC Training

3.2.1 Rating of Training Classes

Six respondents rated PG&E HVAC Training sessions.

On a ten-point scale, these classes averaged a very high score of 9.5. Individual ratings given to PG&E's HVAC sessions were: 10, 10, 8, 10, 10, and 9.

Reasons given by respondents for their ratings included:

- "The PG&E class on sizing is the only class available on the subject."
- "It was really informative. It's amazing, the difference, on the ducts."
- "I enjoyed it a lot. I attended three sessions: combustion, AC/heat pump tune-up, and ducts."
- "The class on ducts was extremely helpful. We're going to need this information not only for PG&E [programs] but also for the state requirements. This gives us an edge because we already have the equipment."
- "The class on sizing was of particular value to me. "
- "I like what they do. They have a good teacher. I like how they work to make sure everyone passes. It's not academic, it's hands-on. They need to do it as hands-on training."
- "It's a benefit to the new guys. I knew a lot of this. I go to their classes to get in their programs. The class on sizing had a very knowledgeable instructor. If I had employees, I'd send them all to PG&E's training."

3.2.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- Heat load calculations; equipment sizing
- Explaining how to read manufacturer's charts and the discussion of "hidden" information that the manufacturers don't make obvious.
- Describing what is the recommended practice and how to do it, with respect to duct diagnostics and sealing.
- Presentation of information on variations in leakage rates from ducts depending on location of leak along duct runs
- "We sell systems based on SEER. It showed me the link between coil size and SEER. We use the engineering data on our jobs."

Three respondents mentioned using course information on jobs when sizing AC systems. It was mentioned that the information is used both for new custom homes as well as for equipment replacements.

Several comments demonstrated use of the information from the duct training. One respondent indicated that they are now doing duct testing and sealing as a direct result of attending the PG&E training. Another indicated an ability to better diagnose duct problems for customers using the class information. A third indicated that he had developed a business strategy to fill his slower season with duct servicing jobs. During service or estimation calls to homes in the busy season, notes are made of prospects for off-season ductwork. They are now preparing a backlog of jobs to perform in the fall. This contractor is also planning to offer customers a quick test to detect leaks. This will be used as a sales tool to develop prospects for duct sealing.

3.2.2 Recommendations

Generally, attendees to these classes had no suggestions for improvements. They indicated that PG&E is doing a good job with their training classes as they are and the respondents were at a loss to suggest improvements.

One individual did recommend developing information to assist contractors with marketing higher efficiency equipment, specifically something with a calculation of annual costs of operation. This information was characterized as "very persuasive for customers." At least one manufacturer, Bryant, and one local utility (an Irrigation District) have offered information like this. The respondent thought PG&E could do something in this area.

Another respondent indicated an interest in more technical information. This individual was pursuing this interest by planning to attend another PG&E class on diagnostics and AC tune-up.

Respondents had few recommendations for locations for the training, indicating that the locations where they had attended prior training sessions worked well for them.

Few suggestions were given as to convenient times for future training sessions. One respondent indicated that he liked the times PG&E was now making their training available. Another suggested a time during the summer, and another preferred the late fall season.

3.3 PG&E Sales Agent Training

3.3.1 Rating of Training Classes

Three respondents rated PG&E Sales Agent Training sessions.

On a ten-point scale, these classes averaged a score of 8.0.
Individual ratings given to PG&E's Sales Agent Training sessions were: 8, 8, and 8.

Reasons given by respondents for their ratings included:

- "It was informative."
- "Nobody discusses this. We don't have enough efficiency information. I'd like to see the training again every year. This is a hot issue. It gives more value to the customer."
- "It was pretty efficient training."

3.3.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- The range of energy efficiency components/options
- Title 24 requirements
- The impact of windows on heat gain and reviewing the windows products available on the market
- The Comfort Home program information

One respondent mentioned using the information gained in the class in the sales pitch used to market their homes. Another indicated using the information in answering questions of prospective homebuyers. It was indicated that buyers – if they have specific efficiency related questions – tend to ask about windows and air conditioning. The third respondent indicated that they do not go into great detail on the information with their customers, but do cover it in broad terms.

3.3.3 Recommendations

One attendee indicated seeing some consumer interest in photovoltaics and other solar technologies and would like to see these options addressed in PG&E's training.

Another attendee felt that the workshop covered too much information for the time available and that as a consequence it was not possible to get into the information in sufficient depth. This individual would like to go over the information on heat transfer effects of windows again and was also interested in air conditioning sizing issues. Estimating monthly utility costs was desired.

One respondent would like to see a greater emphasis on presenting the value to the consumer of each efficiency option. A second attendee would like to see some materials to give to homebuyers addressing efficiency options.

All respondents prefer training at their facilities or close by their offices.

Preferred times for training workshops were mixed: one preferred workshops on Wednesdays, another not on Mondays, and the third preferred Mondays because everyone is in the office.

3.4 SDG&E Builder Energy Code Training

3.4.1 Rating of Training Class

Seven respondents rated the SDG&E Builders Energy Code Training.

On a ten-point scale, this class averaged a score of 7.8.
Individual ratings given to SDG&E's BECT sessions were: 8, 5, 10, 7, 8, and 9.

Reasons given by respondents for their ratings included:

- "I had not heard about the information at that time and I needed to know it. It was very helpful."
- "It was too specific for our department [contracts]. [But] It's a good service."
- "It was really informative. The instructor was very good. He took the time to explain the material."
- "They could have gone into more detail on the AB970 requirements."
- "About 80% of the information was new to me. I have been able to incorporate the information into the training I do for customers. Some of the information was too technical or was a repeat of information I knew."

- "I used to teach energy efficiency. This was very beneficial; I took lots of notes. Some additional technical data or product information would have been useful."
- "The windows demonstrations were marvelous. These were extremely helpful."

3.4.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- The compliance information/ changes in requirements
- Information on windows
- Information on ducts
- The importance of correct design on heating systems

One respondent indicated that their firm uses the information from the class when estimating costs for jobs. Another indicated that they use the information in doing Title 24 calculations and evaluating their choices.

One other builder indicated that they use the course information in their quality control procedures when doing their "QC walks."

One attendee at the BECT class is a sales associate for a builder. This respondent indicated that he has incorporated the information into his marketing communications with customers and has passed along other information to his firm's purchasing department.

Another respondent, who was a designer of custom homes, indicated that he also used the class information to educate clients. He reported that he also makes use of the reference manuals.

3.4.3 Recommendations

Several respondents had no recommendations for changing the training. One would like more detailed information on the new AB970 requirements.

The one respondent who was a designer of custom homes suggested including information on more alternative construction techniques. In particular, he mentioned alternative wall construction options using concrete and styrofoam as deserving inclusion in the training classes.

3.5 SDG&E CHEERS Training

3.5.1 Rating of Training Class

One respondent rated the SDG&E CHEERS Training.

On a ten-point scale, this class received a score of 8.

Reasons given by the respondent for his rating included:

- "The class is good. I don't know if I absorbed it all. I learned a lot, but it went too fast and covered too much."

3.5.2 Topics Valued by Attendee

This attendee most valued the information on air conditioning. The firm uses the information in their planning stages for new construction projects.

3.5.3 Recommendations

It was recommended that more time be allocated for the training sessions. Otherwise the respondent had no recommendations, indicating that the class was useful to him and he feels that SDG&E should continue to offer training similar to what it offers now. [He has been in attendance at other training sessions such as those addressing Title 24].

3.6 SDG&E HVAC Training

3.6.1 Rating of Training Class

Two respondents rated the SDG&E HVAC Training.

On a ten-point scale, these classes averaged a score of 8.8.
Individual ratings given to SDG&E's HVAC sessions were: 10 and 7.5.

Reasons given by respondents for their ratings included:

- It was a '10' for those who need it. This is not my cup of tea. It was very informative. I would let specialists take care of this [AC].
- "It was really informative. The instructor was very good. He took the time to explain things."

3.6.2 Topics Valued by Attendees

No individual topics were singled out as being more valuable than others in this course.

One respondent mentioned that he refers to the insulation specifications presented during this course. The other attendee now uses his new knowledge in his quality control walks used to inspect construction projects.

3.6.3 Recommendations

These attendees had no suggestions for changing the training being offered by SDG&E. One only suggested that SDG&E keep offering training workshops.

3.7 SDG&E Windows Training

3.7.1 Rating of Training Class

On a ten-point scale, these classes averaged a score of 8.75.
Individual ratings given to SDG&E's windows training were: 7.5 and 10.

Reasons given by respondents for their ratings included:

- "I didn't care for the instructor's approach – telling us about his education. I don't have time for that."
- "The course had lots of information. I liked the historical perspective on windows features, how he delineated the players in the market. I also like the instructor's personal experience in litigation and in the products. He has tested the windows in his own home." "San Diego's training has been very good."

3.7.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- Explaining glass types available
- Identifying the features of sub-standard windows.

One respondent indicated that he has added EE windows as an option for his clients [and, personally, replaced his own windows after seeing the information in this course]. The other respondent also indicated that his firm has changed the windows offered. "We dropped one of the windows we were using before. We were marginal on these windows before, but we dropped them based on what we saw in the class."

3.7.3 Recommendations

One respondent would like the class to address the monetary advantage to the builder, not just to the consumer, of switching to EE windows. This respondent gave as an example, the possibility of lowered chances of litigation as a lower cost of the alternative windows.

3.8 SDG&E Sales Agent Training

3.8.1 Rating of Training Classes

Two respondents rated SDG&E Sales Training sessions. Both of these respondents were from the same firm [as were all the names in this portion of the sample frame]. It should be noted that this firm is committed to employee training and places an emphasis on energy efficiency. Furthermore, the lag between the training sessions and these interviews made it difficult for these respondents to recall the SDG&E training with specificity.

On a ten-point scale, these classes averaged a score of 7.5.
Individual ratings given to SDG&E's Sales Agent Training sessions were: 7 and 8.

Reasons given by respondents for their ratings included:

- "The information was helpful but not all new."
- "It was really good. I was already aware of some of it."

3.8.2 Topics Valued by Attendees

One respondent indicated that no single topic stood out as being of more value than other topics. The other respondent indicated that he really could not recall what was covered in this training in any detail. While the respondents could not specify what information was taken away from this training as opposed to other training workshops, it was indicated that information from the training was used to inform homebuyers about energy efficiency features and bill savings. The information is seen as a useful sales tool.

3.8.3 Recommendations

One suggestion offered was the addition of solar technologies and tax credits to the discussions. The other suggestion was to provide attendees with handouts to distribute to their customers.

No recommendations were offered as to either location or time for future training sessions.

3.9 SoCalGas's EAHP Training

3.9.1 Rating of Training Classes

Eight respondents rated SoCalGas's EAHP Training sessions.

On a ten-point scale, these classes averaged a score of 8.6.
On a ten-point scale, SoCalGas's EAHP Training sessions were rated: 9, 7, 10, 6, 10, 8, 10, and 9.

Reasons given by respondents for their ratings included:

- " It was very good. We needed the information as of June."
- "It brought attention to design issues. It's not just the square footage that matters, it's the sun exposure, heat load, etc. The class was also good in providing information on energy losses from ducts."
- "All the sessions were very valuable. In our business it's a lot of on-the-job training. Most of our information comes from other technicians, which is not the best source. This [training] gives a good background – it's very helpful."
- "There could have been more technical information. There needs to be advanced classes available."
- "Knowledgeable instructor."
- "It provided very practical advice. The demonstrations were good."
- "It was very comprehensive and informative. I enjoyed it; I got a lot out of it. I recommended it to everybody."
- "The issues discussed were valuable. It cleared up mistakes prevalent in our industry."

3.9.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- Requirements of AB970, technical information showing the changes in the standards
- Duct testing, energy losses from ducts
- Air balancing
- Building design
- Steps to do the calculations
- Handouts provided

One respondent mentioned using the course information in discussions with builders. Another, this one an architect, felt that they now provide a better explanation to their clients.

Multiple respondents indicate that they use the information for system sizing. One of these respondents indicated that his employees use the manuals “all the time.” Another respondent indicated frequent usage of the information; “I use it on a daily basis when doing estimates. Also for checking workmanship.” Another attendee indicated that they made “a lot of changes” in how they size airflow systems in homes. It was mentioned by another attendee that the information was used not only for new construction but also for remodeling and rehab work.

One air conditioning contractor indicated frustration that he has been unable to make good use of the information provided by the course because the speculative builders with whom he works have not learned to appreciate correct system sizing. In his experience, the builders have a stock assumption of the number of tons required per a given amount of floor space and they seek bids on a $/ton basis. His bids for smaller systems with a higher $/ton quote are not considered, even when the total system price is less than that of competing bids. Because of this practice among builders in how requests for bids are formatted – and their expectations on tonnage - this contractor is losing business when bidding correctly sized systems.

3.9.3 Recommendations

Some respondents had no suggestions other than to continue the training. One requested training to “Keep us abreast of new requirements.”

One respondent indicated that he liked the sessions offered in the past on tune-ups for heating and air conditioning systems and would like to see those workshops offered again. Similarly, another respondent said he would like to see more offered on servicing and on technical information. This respondent is interested in training classes geared for new employees, with introductory information on repair and servicing of air conditioning equipment. Another attendee also recommended more advanced classes. Of particular interest is the class in trouble-shooting air conditioning systems. One attendee felt that the presentation in this training class needed to allow a little more time in the sections addressing airflow and testing.

Lastly, one respondent indicated an interest in having a pamphlet or other materials to give to his clients. One topic mentioned as an example was windows and their effect on building design.

Respondents were asked about preferences regarding timing of training workshops. More than one suggested that seminars not be scheduled during

the summer season. The winter season is preferable; between November and March was suggested.

One respondent indicated that the close timing of the two sessions was difficult. It would suit his business better to have the classes spread across more than one week.

Two respondents recommended evening hours for future training sessions. One individual recommended that the workshops start at 4:00 or 5:00 p.m.

3.10 SCE BECT Training

3.10.1 Rating of Training Classes

Four respondents rated SCE's BECT Training sessions.

On a ten-point scale, these classes averaged a score of 9.25.
Individual ratings given to SCE's BECT Training sessions were: 8.5, 8.5, 10, and 10.

Reasons given by respondents for their ratings included:

- "It opened our eyes. It covered areas we need to focus on."
- "Understood what houses need to get more energy efficient."
- "There are a lot of changes we made to our design based on course input"

3.10.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- information on windows
- information on ducts
- how to properly install insulation
- how to walk a home to see if energy efficient features are being correctly installed

One respondent indicated that his firm used the training information to reassess window and HVAC options. This firm is looking at changing these features of their homes to address changes in Title 24 requirements, if necessary.

Another reported that the hands-on training helped them make their top-of-the-line homes more energy efficient. Another respondent liked that the hands-on

sessions in their construction sites, helped their own building supervisors envision how the properly installed measures should look.

A third respondent indicated that his firm now does room-by-room load calculation and duct design.

3.10.3 Recommendations

One builder indicated that it would be helpful to get more architects involved in the training classes. They tend to rely on architects for technical expertise. He would also like to see more training for subcontractors, particularly HVAC contractors.

Most of the respondents wanted training near their sites. Several respondents indicated that the field training was the best feature of the training and that more of it should be built into the curriculum.

One builder involved in both SoCalGas's and SCE's programs, would like it if the two programs could be coordinated so that either program's testing would cover the other's. As it stands now, he has to perform two sets of tests to qualify his homes.

One builder asked to have a session on radiant roof barriers, their usefulness and how to properly install them.

3.11 SCE HVAC Training

3.11.1 Rating of Training Classes

Respondents rated SCE's HVAC Training sessions.

On a ten-point scale, these classes averaged a score of 9.2
Individual ratings given to SCE's HVAC Training sessions were: 7.5, 10, and 10.

Reasons given by respondents for their ratings included:

- "I learned some things I didn't know"

Topics covered by the course included:

- Space conditioning specifications
- Title 24 requirements
- Sizing
- Duct testing and sealing
- Refrigerant charging
- Diagnostics and tune-ups

3.11.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included:

- "The duct testing and sealing demonstration."
- "Load calculation, duct design and equipment selection."

These respondents indicated that they attend a number of training courses each year, some of which are offered by the manufacturers and the distributor they use. It was hard for them to specifically recall what information was obtained in this session.

One respondent noted that they used to install almost exclusively SEER 10 units, and that now they are mostly SEER 12 and sometimes SEER 14.

Another noted that they now use the information to design duct system and size HVAC based on room-by-room calculations.

3.11.3 Recommendations

One respondent noted that due to the large turnover rates for his staff, the utilities need to continuously re-offer training courses.

As for location, it was preferred that training be provided locally, that is less than thirty minutes away from the office.

3.12 SCE Sales Agent Training

3.12.1 Rating of Training Classes

Three respondents were asked about SCE's Sales Training sessions.

On a ten-point scale, these classes averaged a score of 7.0.
Individual ratings given to SCE's Sales Agent Training sessions were 7 and 7.
One respondent did not provide a rating because her recall was so poor.

Reasons given by respondents for their ratings included:

- " The Comfort Wise Program, which we are in, exceeded what they were talking about in the seminar."

3.12.2 Topics Valued by Attendees

Elements of this training found to be of the greatest value included the information on windows and specific technical information.

The information is used in talking to prospective homebuyers, to reinforce theirs sales approach.

3.12.3 Recommendations

One respondent is interested in information on the latest developments in energy efficiency options and on estimating electric bills for homebuyers. She also would like information pertaining to the new AB970 requirements.

As for location, it was preferred that training be provided locally. One respondent indicated that Monday afternoons are preferable. The other commented that SCE came to their office and scheduled it at their convenience.

3.13 California Building Industry Association Training

3.13.1 Rating of Training Class

Very few respondents were aware of any training offered by the California Building Industry Association or the local homebuilders associations. [4] Fewer than ten percent of the individuals we interviewed were aware of any training offered by these associations. We found it noteworthy that among this population of builders, which includes a number of firms that regularly integrate employee training into their operations, that awareness should be so low.

Three respondents rated the training offered by the CBIA or the local homebuilders association.

On a ten-point scale, these classes averaged a score of 8.8.
Individual ratings given to training sessions of the state of local homebuilders associations were: 10, 8.5, and 8.

Reasons given by respondents for their ratings included:

- "The class had five or six speakers addressing different techniques – sales, financing, etc."
- "It provided new knowledge on ducts, glass types, etc."
- "It was entertaining training on sales."

[4] We found that at least some of the training offered through CBIA is promoted through the local homebuilders associations and so modified the original question in the interview to reference both CBIA and the local associations.

3.13.2 Topics Valued by Attendees

It is possible that these respondents were rating two different types of training. It appears that one respondent attended a session that was significantly more technical than that attended by the other two respondents who got sales training.

The respondent who attended the technical training indicated that the information obtained from the seminar is now used in following up with subcontractors. The other respondents indicated that the information they gained has been useful in home sales.

4. NONPARTICIPANT INTERVIEWS: OVERVIEW AND APPROACH

This section summarizes research findings obtained from in-depth interviews with 33 builders who had not taken in part in one of the utility RNC training programs at the time of this study. This research supplements the participant interviews, detailed in the previous chapters, which were conducted with builders, contractors and home sales agents who had attended utility training workshops.

This research paralleled that conducted with the participants in terms of topic coverage, with the exception of questions gathering feedback on the utility training workshops. The reader should note that the participant and nonparticipant studies were conducted sequentially, with the nonparticipant interviews occurring on average five to six weeks after those conducted with training participants.

4.1 Research Topics

The research topics and interview guide for this set of interviews is nearly identical to that used with the participant research. Minor modifications were made to screen for unidentified training participants and to eliminate questions pertaining to specific training sessions. The nonparticipant research explored the following topics:

- awareness of changes in code requirements
- expectations of impacts of code changes on business
- current practices in meeting Title 24 requirements, including outsourcing to subcontractors or Title 24 consultants
- adequacy of current assistance and desire for additional services
- general use of training workshops
- recommendations for future training
- awareness of, and participation in, energy efficiency programs
- perceived relevance of efficiency programs to their businesses
- suggestions for utility action to support trades in meeting AB970.

The interview also addressed the effects of recent energy market volatility on the respondents' businesses including, but not limited to, changes in customer demand for energy efficient products, features, and services.

Sampling

4.2.1 Summary of Sample Frame

A list of active builders for California including address and annual sales volume was purchased. The broad distribution by sales volume is shown in Table 4.

Table 4: Nonparticipant Builder Sales Volume Distribution

Sales Volume	Number of Builders in Database
Less than $500,000	236
$500,000 - $ 1 Million	257
$ 1 Million - $ 2.5 Million	111
$ 2.5 Million - $ 5 Million	47
$ 5 Million - $ 10 Million	31
$ 10 Million - $ 20 Million	8
$ 20 Million - $ 50 Million	14
$ 50 Million - $ 100 Million	4
$ 100 Million - $ 500 Million	5
$ 500 Million - $ 1 Billion	1
Over $ 1 Billion	3

4.2.2 Sampling Approach

The list was divided into three sample frames as shown in Table 5. As the sampling implies, a serious attempt was made to oversample the largest builders in the population. Reaching the smallest builders, who oftentimes have no office staff, proved to be difficult.

Table 5: Sample Frames for Nonparticipant Research

Sales Volume Range	Number of Builders in California	Original Sample Size	Actual Sample Size
Greater than $5 million	66	18	14
$2 million to $5 million	158	13	14
Less than $2 million	493	10	5[5]

[5] Does not include 2 interviews terminated before demographic data could be obtained.

4.3 Characteristics of Interviewed Firms

The sales information provided with the purchased sample was not always a good measure of the true activity of the builders. For this reason, builder size was reclassified to reflect number of homes built as reported by respondents during our interviews. Table 6 shows the breakdown of respondents.

Table 6: Characteristics of Nonparticipant Respondents

Respondent	Sales Volume	Number of Homes Built
1	$100 to $500 Million	2000
2	$100 to $500 Million	2000
3	> $1 Billion	1500
4	$5 to $10 Million	600
5	$2.5 to $5 Million	550
6	$5 to $10 Million	500
7	$2.5 to $5 Million	477
8	$50 to $100 Million	375
9	$1 to $2.5 Million	375
10	$2.5 to $5 Million	350
11	$20 to $50 Million	300
12	$2.5 to $5 Million	300
13	$20 to $50 Million	275
14	$2.5 to $5 Million	200
15	$5 to $10 Million	160
16	$2.5 to $5 Million	125
17	$2.5 to $5 Million	114
18	$5 to $10 Million	100
19	$2.5 to $5 Million	100
20	$1 to $2.5 Million	100
21	$5 to $10 Million	50
22	$500,000 to $1 Million	50
23	$2.5 to $5 Million	45
24	$5 to $10 Million	35
25	<$500,000	30
26	$500,000 to $1 Million	25
27	$2.5 to $5 Million	13
28	$5 to $10 Million	12
29	$1 to $2.5 Million	12
30	$500,000 to $1 Million	10
31	$1 to $2.5 Million	7
32	$500,000 to $1 Million	6
33	$5 to $10 Million	2

In our analyses, we compared data from larger and smaller builders. For analysis purposes, we defined large builders as those constructing in excess of 200 homes per year. As Table 6 shows, 13 of our population of 33 respondents fit this definition of large builders.

Other general characteristics of this population were as follows:

Homes built per annum:	Average = 327;	range: 2-2000
Full-time employees:	Average = 130;	range: 1-2500
Years in Business:	Average = 20.5;	range: 2-62

Overall, speculative building activity was more prevalent in this population than custom homebuilding: 27% of the firms interviewed specialize in custom-built homes, 28% do both custom and speculative construction; the remainder, 45%, construct speculatively built homes exclusively.

5. NONPARTICIPANT INTERVIEWS: RESEARCH FINDINGS

This section summarizes the information collected from builders that had not participated in utility-sponsored EE training at the time of this study.

This chapter presents information pertaining to broad market conditions, business practices, and reaction to utility programs. As was the case for the participant research, major topics include:

- Impacts of energy markets on business conditions
- Title 24 Issues
- Perspectives on efficiency programs
- Training practices and experiences

Chapter 6 provides a comparison of findings from this nonparticipant group with the information gathered from firms participating in the new construction training workshops.

5.1 Impacts of Energy Markets on Business Conditions

5.1.1 Effects of Recent Market Volatility and Supply Interruptions

At the time of these interviews, the effects of the energy crisis in California were becoming increasingly visible. All respondents were asked to characterize the degree to which recent energy market conditions have affected their businesses. Answers on this subject were very mixed. While a large majority, 81%, reported little or no effect on their business as yet, there were indications that this situation is changing for some firms. The firms reporting large effects indicated that sales have slowed and projects have been cancelled. Other firms that have not yet felt any substantial effects are getting more cautious as well. Ten percent of the builders who have experienced little or no effects to date are never the less making adjustments in their business planning as a result of the poor energy situation and its consequences.

At the time of our research in June 2001, responses were as follows: 48% reported no effect to date, 33% reported slight effects, 12% had experienced a moderate effect, and 6% had suffered a significant negative impact. Characteristic responses included the following:

- “We haven’t felt it yet, but we’re headed for a slowdown. We’ve had some price increases but not in energy itself.”
- "There has been some impact, but nothing that bad. The crisis has forced everybody to look at the features and explore what alternatives are available."

- "Our power bill has increased, we've felt a direct effect."
- "Subcontractor material costs are going up!"
- "Prices are increasing. People are barely getting in to homes. Now they are not only concerned about mortgage payments, they're worried about what their power bills will be."
- "The costs of doing business have escalated tremendously. This affects the consumer – they may not have the funds for projects that they could have afforded last year."
- "There may be an effect on consumer confidence, I'm not sure. The market in the Bay Area is slow, Sacramento is good."
- "Developers are getting more cautious. They don't want to buy land or start projects. We have backed out of several projects recently."
- "The bankruptcy of PG&E has affected us. We have three-quarters of a million dollars tied up and can't get the money from them. It has changed our relationship with PG&E. We're not so sure about new work with them."
- "On new homes we saw engineering delays from PG&E."
- "We can't get the people at PG&E to schedule jobs. It should take 10 weeks, but it takes 26 weeks. They need more manpower."
- "The effect on us has been minimal. In some situations we have had trouble getting energized; there have been delays in establishing service to the homes."
- "It hasn't really affected us."
- "So far it has not affected us. We've had no blackouts at our corporate office. Certainly energy efficiency is a key issue for homebuyers but that is not just in California, it is true elsewhere across the country too."
- "It has not affected us much yet, but I expect it to."

The types of effects reported by larger builders differed somewhat from their smaller counterparts. More than one in four (23%) of larger builders complained about utility manpower shortages and the consequent delays on their operations, whereas none of the smaller builders expressed concern in this area. Larger builders were also more likely to indicate that the energy situation was increasing their costs (23% vs. 15%) and leading to project cancellations (8% vs. 0%).

5.1.2 Trends in Demand for Energy Efficiency

When asked in particular about energy market effects on consumer demand for higher efficiency options, opinions were divided: 32% felt there had been no increase in interest in efficiency while 61% felt that homebuyers were more interested. [The remainder was uncertain whether or not consumer interest levels had changed at all.] Larger builders were more likely to report increased

consumer interest in efficiency (69% vs. 50%). Among those who felt there was more interest in energy efficiency, there was not always a strong conviction that this translated into changes in home selection behavior. Comments on this subject included the following:

- "It has heightened awareness among homebuyers but it has not had a dramatic effect."
- "There has always been an interest in energy efficiency [in the custom homes segment]. There is a little more now."
- "We haven't really seen any more interest in energy from homebuyers."
- "Starting to. It is not a big factor, as yet."
- "A year ago, we saw some interest. Now, homebuyers are willing to spend the money up front if they can recover the costs shortly."
- "An energy efficient home is good, it's of interest to buyers."
- "They are very concerned. … Consumers are becoming more educated about cost versus payback."
- "Lots of questions from homebuyers. A number of builders are putting SDG&E program signs in front of homes and buyers are asking if they are a part of this program. So, we are moving to become a part of it!"
- "There is a new awareness and concern among homebuyers."

As reflected above, while a number of builders were not convinced they were seeing noticeable changes in home buying patterns, others felt there was enough interest to add new efficiency options for buyers to select if they wished. We also found a certain segment of homebuilders that emphasizes energy efficiency in their homes and intends to continue to move forward, incorporating more new features to remain ahead of their competitors in this respect.

5.1.3 Efficiency Features Desired by Consumers

Homebuilders were asked to characterize the type of consumer interest in efficiency that they typically encounter when marketing new homes. More than one in five builders (22%) indicated that energy efficiency does not generally come up for discussion. An equal number of respondents reported that when consumers inquire about energy efficiency, the questions are often non-specific in nature (22%). When customer inquiries are specific, the most common subjects are insulation (52%) and windows (43%), followed by appliances (22%) and air conditioning (13%).

5.1.4 Changes Planned to Address Consumer Demand for Efficiency

While most builders we interviewed (58%) indicated that they were not planning changes in energy efficiency features in response to market demand,[6] this response varied dramatically across the larger and smaller builder segments. Only 38% of the larger builders indicated that they were planning no changes in anticipation of increased consumer demand, in contrast to 72% of the smaller builders. This was the question with the greatest divergence in answers between these two builder groups.

Among builders expecting future increases in consumer demand for efficient features, we explored what actions were planned to address the market's concerns. Several actions have been taken to add efficiency options to homes now being brought to market. Interestingly, these did not always correspond to the features identified above as being most asked about. The most frequently mentioned category of measures being added to newer homes was solar options (19%; 6% for photovoltaic and 13% for other solar technologies). Respondents mentioned recently opting to include:

- tighter ductwork
- high efficiency HVAC systems
- changes in HVAC system designs [zoned systems, split systems, reduced tonnage]
- low-e glass
- solar tubes
- solar water heating
- rooftop photovoltaics

Custom builders reported that the array of measures varied from home to home.

Air conditioning systems appear to be getting more attention now. This may be a result of incentives now available, however, the builders we interviewed did not mention this as a causal factor. Importantly, SEER alone is not the sole focus for air conditioning system improvements under consideration. Different respondents demonstrated an awareness of system design and installation issues that affect operating efficiencies of air conditioning systems.

As was also noted in our participant survey, solar applications seem to be of increased interest at present. A few builders report action in adding solar options or are seriously evaluating solar products for inclusion in future homes. One comment on solar was, "If we could provide an aesthetically pleasing and cost-effective solar product, it would be worthwhile."

[6] A separate question delved into changes planned in response to changes in code requirements; this is reported in section 5.2.3.

Respondents were also asked to discuss efficiency measures they had considered but decided not to utilize. Some responses on this subject included:

- "We looked at low-e windows, but we can meet the standards using vinyl framed windows and the air conditioning we've chosen to go with. I'm not really sure why other builders are using the low-e windows."
- "We're still looking at them [efficiency measures]. We haven't rejected any yet. Some have been easier to implement [i.e., easier to determine to be cost-effective] than others."
- "We used to build homes that were more efficient than the norm, but now the standards are so tight, we don't do much more than other builders."
- "We don't give buyers a lot of [efficiency] options. They don't ask."
- "Generally we are offering market set, market demanded, products and features."
- "We pretty much match what is in the market place."

5.2 Title 24 Issues

5.2.1 Outsourcing of Title 24 Responsibilities

This research investigated how builders are addressing Title 24 requirements in terms of whether or not they utilize outside assistance from Title 24 consultants or subcontractors. Our findings suggest that the majority of builders are likely to outsource responsibilities for Title 24 conformance and plan review to someone outside their own firm. More than three quarters (78%) reported using outside assistance in this area: 63% relying solely on this external support and 15% using their own personnel as well. Roughly one firm in five makes no use of outside assistance on Title 24 issues. Larger builders were much less likely to handle all Title 24 matters internally (8% vs. 32% for smaller builders).

Most commonly this assistance comes from a Title 24 consultant (50%). The second most likely source of assistance came from trade subcontractors (25%), followed by general contractors and architects (11% apiece). Most firms that are now using outside assistance report being satisfied with the quality of the services received (86%).

5.2.2 Awareness of Changing Code Requirements

The majority of respondents were aware that Title 24 standards were changing this year and a number reported that their firms were now in the process of working through the requirements to determine how to address them. Only 12% of these respondents indicated that they were unaware that the standards were changing. Smaller builders were twice as likely as larger builders to report that they were unaware of the changes (16% vs. 8%).

5.2.3 Anticipated Changes in Practices

Homebuilders were asked what effect the new standards would have on their new construction projects. Quite a few respondents could not say how their firm might change the homes they bring to market as a result of the new standards (13% overall; 29% of smaller builders and 8% of larger builders).

- "We're still looking at it. We're looking at the costs and cost-effectiveness."
- "We will rely on our consultants to determine what we need."
- "Our practice is going in that direction. We continue to look at what improvements we can make."
- "The homes will become more efficient due to the Title 24 changes. We will meet the new requirements with needed energy efficiency features."

Others only responded that they expect the new requirements will increase their costs of constructing new homes (37%) or that they would incorporate more efficiency features (23%), and did not give specific answers as to what changes might be made to accommodate the stricter code requirements.

The following actions were under consideration or planned for the future at the firms which offered specific answers to this question[7]:

- higher SEER AC systems, changes to AC condenser
- more efficient windows
- changes in the amount of glazing used
- increased insulation
- more efficient heating systems
- photovoltaics
- reflective roofing
- Comfort Home program participation.

Some respondents who were already building more efficient homes felt there would be little or no impact on their business from the change in residential construction standards. Overall, one in five respondents indicated that they anticipated no effect on their practices from the new standards. This was another question for which the answers of the larger builders differed significantly from those of the smaller builders (8% vs. 29%, respectively). These data suggest that the larger builders will be making changes more quickly in response to the new requirements than will smaller builders.

[7] Due to the small number of respondents providing specific answers to this question, each of these items was mentioned by no more than two respondents.

5.2.4 Need for Title 24 Assistance

Respondents were also asked whether they feel there is a need for utilities to provide some type of assistance regarding the new standards. The timing of this survey made it somewhat difficult to get useful information on this topic because, while respondents were aware that new requirements were about to go into effect, some had not as yet attempted to work with the new standards. Despite this limitation, nearly one-third of our respondents (32%) felt that the utilities could play a useful role in this arena. Comments to this effect included:

- "The new construction regs are pretty clear. The requirements for remodeling work are really unclear. … Something clearer would lead to more installation."
- "Any help from the utilities would be good. … Insight on how to present information to clients would be a great deal of help."
- "More involvement with the community in order to explain these requirements and what they do."
- "Sure there are gaps. More information for general contractors, sub-contractors, and homeowners needs to be out there. A lot of people could be made aware - the utilities could help on this."

Other respondents were more sanguine on this subject. Some comments offered include:

- "We don't need assistance from the utilities on Title 24. We'll use the firm we're using now."
- "There are a lot of Title 24 consultants out there and they approach us weekly to try to get our business."
- "There is a lot of information out there on Title 24. I don't see a need for utility help here."
- "The Title 24 person just takes the plans and gives us the calculations for the plan..."
- "Nothing, unless they are willing to do the Title 24 calculations for us, but I don't really see the utilities doing that. They could identify what's working and what's not."
- "We're getting advice on Title 24 without the utilities."
- "So far, so good. No - there is nothing in the way of gaps for the utilities to fill."
- "It's not a problem."

5.3 Perspectives on Efficiency Programs

5.3.1 Overall View of Programs

Respondents were asked their opinion on the value of utility-sponsored programs promoting efficiency in new construction, programs such as Energy

Advantage Home, Comfort Home, Comfort Wise, etc. As a group, 72% professed an awareness of the new construction programs offered by the local utility. Awareness of the programs was significantly higher among large builders: 92% vs. 60% for smaller builders. A similar pattern of higher awareness among large builders was also evident for the Energy Star program (75% vs. 55%; 63% aware overall). In contrast, there was very little difference between these two groups in their opinions of the programs: 54% felt that the programs make an impact on residential new construction while more than one-third, 38%, felt that these programs are not relevant and influential.

One respondent indicated that there is a need for some similar branding or recognition of super efficient custom homes, arguing that these homes can outperform homes certified in the utility programs but do not benefit from the certification given to speculatively built homes. This response implies that the custom builder would find marketing advantages in being able to assert that his homes met or exceeded the standards of the utility programs.

Two respondents indicated that the programs could be made to be more effective. One respondent indicated that the programs really suffer in effectiveness when there is insufficient marketing to the consumers. The other respondent indicated that the programs were more effective in the past when the requirements were simpler and it was easier for builders to participate.

One builder indicated that the requirements help them to meet specs, but that they always have to keep an eye on the costs involved. Another builder indicated that the programs were relevant because they can be used in marketing efforts to sell more homes. The programs were also deemed important because several of their competitors were utilizing the programs as a sales point. Another builder indicated that the programs make an impact because they serve as a perk -- they make the houses stand out! Sales agents within this company generally try to sell this point. Again, however, several builders indicated that the real tangible effect of these programs was minimal. They just participate despite what they perceive to be a lack of marketing on the part of those offering the program.

5.3.2 Participant Views of New Construction Programs

Our respondents included a handful of firms participating in the RNC programs. Feedback on the programs was gathered from respondents, including program awareness, consideration given to the programs, and reasons for not participating in the programs.

Reasons for not participating in the programs included a dislike of the program requirements, lack of awareness of the programs, and simply not viewing

participation as a business priority. Among firms that had chosen not to participate or that had dropped out, the following is typical:

- "These programs made an impact in the market in the past, but now they are too cumbersome. There is too much paperwork."
- "There is too much paperwork - It is like doing tax forms. It is no longer a line item equals a savings. Each item eats up time due to paperwork requirements."
- "There is a need for programs like this, but these programs the utilities have now are pretty restrictive."
- "We like the people, but to have the tight duct which is a pain -- just another inspection."
- "These program could make a difference *if* there was collateral marketing by the utilities. More information needs to get out to the consumers."
- "This was not seen as too important until recently."
- "Not needed in sales. Energy is not a key selling point. People want, and are buying, our homes."
- "We've been too busy."
- "The market is so hot that, if you have it available, then the public is buying it."
- "We were in the Comfort Home program but we're not now because there isn't a program any more."
- "There are too many regs. The costs outweigh the rewards."

A handful of other respondents indicated that they are not participating at present because the location of the homes under construction is outside of the respective utility service area.

Awareness of the Energy Star program was lower than for Comfort Wise and Comfort Home programs. The lack of awareness was one of the more common reasons given by respondents as to why they had not participated in the Energy Star program. Respondents also tended to indicate that the Energy Star program was not worth the trouble required to participate. Comments on the Energy Star program included:

- "This program cost us more than Comfort Home. The marketing benefits relative to Comfort Home were not worth it."
- "I am not for Energy Star. It's too much headache for the return we get."

5.4 Training Practices and Experiences

5.4.1 Practices and Perspectives on Training

Respondents were asked to characterize the amount and types of training made available to employees in their firms. Practices in this area varied quite a bit with respect to the number of seminars attended during the course of a year, ranging from 0 to 40. While there was a diversity of opinions on the subject of training, it appears that a sizeable portion of this sample population places less value on training than the respondents we interviewed earlier who had enrolled in utility –sponsored workshops. In part, there is evidence of a lower commitment to training in the data collected from the completed interviews. In addition, further lack of interest is inferred from the behavior of the firms called; we got a higher rate of returned calls from the participating firms than from this sample, and a higher rate of refusals from this sample.

Among our respondent population, 27% indicated no involvement with training programs of any kind during the preceding year. This survey population was also unlikely to have addressed energy-related subjects in the past year's training activities. More common topics for training include safety, environmental and legal issues, and sales techniques. A couple builders indicated that they do not pursue training on energy efficiency as they rely on their vendors to address these concerns. The smaller builders were more likely to indicate that they did not send any employees to any training during the course of the last year. Despite this, the smaller firms still sent a higher proportion of their employees to training workshops (43% vs. 23%; 35% for the overall population). This reflects the fact that when smaller firms utilized training workshops, these firms enrolled a larger proportion of their employees.

Among those respondents with an interest in the training topics now being offered by the utilities, there was no clear consensus on preferred subjects. Some respondents were interested in the more technical workshops, others in the sales-focused workshops. Overall, more respondents selected the sales training, HVAC training, and windows training options when listening to an interviewer list available workshops. In a separate question asking for their own ideas on topics, the most common requests were new building code requirements and sales or marketing topics.

5.4.2 Sources of Training

Sources most often used for technical training include the manufacturers and the utilities, but also including subcontractors, sales training consultants and building trade workshops.

Within the group of builders who pursue training, we found noticeably more use of the training offered by the California Building Industry Association in this study

as compared to the recently completed survey of participating builders and contractors. Our findings from participants in utility training indicated minimal use of the CBIA training and even widespread lack of awareness that such training existed. In contrast, the current set of respondents was likely to be aware of the availability of the training and 60% had, in fact, attended CBIA training. Attendance at CBIA training was somewhat higher among the larger builders: 69% vs. 53% among the smaller builders.

5.4.3 Rating of California Building Industry Association Training

This section summarizes ratings given to the training offered by the California Building Industry Association and or the local homebuilders associations.

Four respondents rated the training offered by the CBIA or the local homebuilders association. On a ten-point scale, these classes averaged a score of 7.0. Individual ratings given to training sessions of the state of local homebuilders associations were: 7, 9, 7, and 5. Reasons given by respondents for their ratings included:

- "Their topics are usually good; they're in areas where we're a little lacking. I'd say they are above average."
- "We attend a lot of BIA training. All of our staff has gone to BIA workshops."
- "This was a few years ago. The instructor was not well versed on the material. He read the information and could not go in to depth on the information."

There was very little information gathered about other training workshops. Selected comments received included:

- "Consol did an outstanding job. The information they presented was specific to our company. The slides they showed were of our homes. This really made an impact with our people."
- "I didn't attend the training on ducts but people said it was very informative. We have implemented the knowledge in the field. We understand the function of the duct systems better."

5.4.4 Recommendations on Training

Builders were asked to provide recommendations on utility training workshops. Many had no specific recommendations, although some mentioned topic areas for consideration. The topics suggested emphasize coverage of whatever is new, whether it is Title 24 requirements, installation practices, or new and superior products. Requested training topics included:

- Information on new products
- Updates on new requirements

- In-depth information about what can be done to meet the new standards and recommendations on specific products and building materials
- Information on best installation practices
- Information on more efficient usage of air conditioning systems
- Information on new solar products
- Information on residential lighting
- Information on rates/the costs of utilities, including how this varies geographically
- Relationship between tighter homes and mold problems
- Home design, especially addressing glazing area
- Information designed to assist builders in educating prospective homebuyers as to the efficiencies to be gained through the use of energy efficiency features, and the potential for offsetting the up-front initial costs to the buyer.

A couple of respondents in the peripheral parts of PG&E's service area indicated that they were unaware of any training being offered at present. For these respondents, recommendations focused on advertising the availability of the training and offering the training locally.

Respondents were also asked about their preferences on the scheduling and location of future training sessions. The most prevalent opinion was that location mattered most, and that nearby facilities or in-house trainings were clearly preferred. Some of the builders located in more rural areas, in particular, preferred having workshops held more locally and not in the "large cities."

6. SYNTHESIS OF STUDIES

This section presents two sets of findings comparing key market subgroups. First, differences between training participants and nonparticipants are noted. Next, a comparison is made between builders on the basis of size of the firms.

6.1 Comparison of Training Participants and Nonparticipants

The data from the survey with participants in utility-sponsored training were compared with the data from the builders who were not listed as having attended energy efficiency training. The reader should note that the participant and nonparticipant studies were conducted sequentially, with the nonparticipant interviews occurring on average five to six weeks after those conducted with training participants.

In many respects, the responses from nonparticipants mirrored the answers from firms that had participated in utility-sponsored training. Key areas where the answers of these two groups diverged substantially included the following:

- Nonparticipants as a whole place less emphasis on training
- Nonparticipants were slower to incorporate efficiency features into their homes in response to recent consumer concern over energy issues
- Nonparticipants were less likely to be aware of, or to value, the RNC programs offered by the utilities.

Further details on these differences are described below.

6.1.1 Training Practices

Nonparticipants, as a whole, place less emphasis on employee training in general and efficiency training in particular. Nonparticipants were less likely to have enrolled their employees in training on energy efficiency topics during the course of a typical year (30% vs. 100%). Furthermore, more than one-quarter of nonparticipants (27%) indicate that there was no attendance of training activities of any kind during the prior year.

Interestingly, the nonparticipants were ten times more likely to attend the training workshops sponsored by the state and local building associations than were the firms that participated in the utility-sponsored workshops (60% vs. 6%). In some cases this was attributed to a lack of utility-sponsored training in proximity to the offices of nonparticipants.

6.1.2 Response to Market Changes

Nonparticipants were less likely to be planning to add efficiency features to their new homes in response to increased consumer interest in energy issues. Nonparticipants were nearly twice as likely as participants to report that they had no plans to upgrade efficiency features (58% vs. 30%).

6.1.3 Awareness of RNC Programs

Training participants were also more likely to be aware of one or more utility-sponsored RNC programs [Comfort Home, Comfort Wise or Energy Advantage Home]. Nearly one-quarter of nonparticipant respondents indicated they were unaware of the new construction programs.

Training participants were also more likely to see value in the RNC programs. Whereas all training participants indicated that these programs were relevant to the new construction industry and influenced the market, only 54% of the nonparticipants felt this way.

6.2 Comparison of Larger versus Smaller Builders

Analyses were conducted for the group overall, as well as for larger builders vs. the remainder of the builders. [Larger builders being defined to include firms reporting construction rates of over 200 homes annually.] Findings for the larger builders paralleled those for the overall group except with respect to the characteristics highlighted below.

6.2.1 Effects of Energy Price Volatility

Difficulties from the volatile energy situation in California appear to be affecting larger builders more strongly. Larger builders were more likely to indicate that the energy situation was increasing their costs and, more recently, leading to project cancellations. A greater wariness to undertake new projects was noticeable among some of the large builders interviewed.

Large builders were somewhat more likely than smaller builders to report increased consumer interest in energy efficiency of new homes, in terms of questions asked by consumers when shopping for new homes (69% vs. 55%).

6.2.2 Response to Market Changes

This research found that, as a group, smaller builders are slower to make changes in response to shifting market conditions than are larger builders. Smaller builders were three times more likely to indicate that they did not know what upgrades they would make in response to code changes (29% vs. 8%) and

were nearly twice as likely to indicate that they were not planning to incorporate new efficiency features in response to consumer demand (72% vs. 38%).

This slower response may in part be due to information barriers. Smaller builders were twice as likely as large builders to report being unaware of changes in the Title 24 requirements (16% vs. 8%); furthermore, they were much more likely to be unaware of energy efficiency programs for new homes (50% vs. 8%).

The difference in response times may also be linked to resource issues: we found a difference in usage of contractors or consultants for assistance on Title 24 issues, with smaller firms being four times more likely to indicate that they handle these matters without any outside assistance (32% vs. 8%).

6.2.3 Training Practices

Patterns in training practices differed between the large and small builder populations. Smaller builders were more likely to indicate that they had not sent any employees to any training during the past year. Despite this, the smaller firms sent a substantially higher proportion of their employees to training workshops (43% vs. 23%, on average). Interestingly, while fewer nonparticipant firms enrolled employees in training classes, among those that did, more employees were sent.

Attendance at CBIA training was somewhat higher among the large builder group than among small builders (69% vs. 53%).

6.3 Conclusions

These findings suggest that the differences between large and small homebuilders are substantial with respect to a number of issues relevant to training and RNC programs addressing energy efficiency. Consideration should be given to whether and how the utilities may want to react to these differences, possibly by refining and targeting their offerings in ways tailored to these group differences.

7. RECOMMENDATIONS

7.1 Training

7.1 1 Training Content

RNC training should be continued and expansion opportunities should be considered. First, it is recommended that the utilities continue to offer RNC training support to the residential new construction market. The current scope of the RNC training courses with respect to course topics appears to be meeting a number of needs of homebuilders and residential contractors. There is interest among builders and contractors in having the utilities continue with the training now being offered. The quality of the instruction was also praised and most participants urged the utilities to continue with their present training efforts.

Suggestions offered for additional training included: products and materials available for meeting energy code changes, and focused sessions on measures such as solar water heating, photovoltaics, and radiant roof insulation.

7.1.2 Training Sites

Proximity of the training site to the builder's or contractor's business is important for attracting attendance. One area where there is room for improvement is in the delivery of training services, especially to areas that are remote from large cities or utility offices. Universally, builders and contractors indicated a preference for proximity to their own offices. Some respondents whose firms were more removed from the utilities' offices reported being unaware of either the RNC programs or the training workshop opportunities or both. The training initiatives could have greater impact if their reach into a larger geographic area could be accomplished.

7.1.3 Coordination with CBIA

Coordination with trade associations such as the California Building Industry Association may provide an effective means of reaching out to builders who are not presently involved with any of the utility-sponsored training efforts. Among nonparticipating builders, we found higher levels of awareness of the CBIA training offerings as compared to awareness of the utility training. Furthermore, the CBIA-sponsored training tended to be viewed favorably and the local presence of the homebuilders' associations is an added plus. It does not appear that builders are now getting efficiency training from the CBIA, so utility efforts may well complement what is now offered by this key trade association.

7.2 Other Assistance

7.2.1 Consumer Education

Efforts at consumer education are needed to increase the effectiveness of intervention in the residential new construction market. Feedback from our respondents provides indications that offering technical and sales training alone is not sufficient for advancing the new homes market in its promotion of higher efficiency options. Frequent comments and suggestions addressing consumer education indicate that there are substantial barriers in this arena. Aids for marketing efficiency features to consumers would be widely appreciated by builders, architects, and contractors. More handouts to pass along to consumers or additional marketing tools to show to customers during face-to-face discussions were of interest.

7.2.2 Title 24 Assistance

In addition to training, the utilities should consider the possibility of offering more direct assistance on Title 24 requirements to builders, contractors, architects and related professions. While the entire builder market would not utilize this assistance, there is a sizeable segment of the builder market that would welcome utility involvement in this area. Some of the options suggested by the respondents included: assistance in identifying options suited to the new code requirements; posting code-related information on a web site, or providing plan review for architects and builders.

Title 24 consultants and HVAC contractors desire concise information. Persons who expressed a need for assistance in understanding Title 24 changes and implications for this work highlighted the need for simplicity -- prescriptive steps for complying, specific examples, and web-based information. These tools may be useful during training sessions, or as follow-up resources that participants may utilize.

Smaller builders appear to need more assistance in adjusting to code changes than do larger builders. This research found that smaller builders might be held back from responding to changing market conditions. This finding suggests that the utilities may want to target some of the training and outreach to the smaller builders to assist them in incorporating energy efficiency into their business practice.

APPENDIX A:

INTERVIEW GUIDE FOR RESIDENTIAL BUILDERS-- TRAINING AND RELATED ISSUES

4/23/01

Introduction and Screening

Hello, I am _____, and I am calling on behalf of California's four investor owned utilities. The utilities are working to develop new programs to promote energy efficiency in new homes. Can you please tell me who the best person is to talk with about marketing your homes, as well as best person to talk with about the energy efficiency features that are included in the homes.

Note contacts:

Sales / Marketing Agent Contact:

Are you familiar with the procedures and strategies your firm uses for marketing and sales of the homes?

(If No) Who would I contact for that information?

Contact:

Technical Decision-maker Contact:

Are you familiar with the how decisions about what energy efficiency features are included in the homes you build are made?

(If No) Who would I contact for that information?

Contact:

Market Conditions

1. The current energy crisis has obviously had a tremendous impact on many businesses. How has this crisis affected the home building business in general and your business in particular?

2a. Have you seen a significant change in homebuyer interest in energy efficiency in light of recent events in California and, if so, how has your firm responded to these changes?

2b. (If no change seen yet) Do you expect to see greater interest in energy efficiency among homebuyers this year? (If yes) What changes, if any, do you plan to make in response?

3a. What features distinguish the homes you build from other similar homes in your area?(If they mention energy efficiency, probe for details.)

3b. (If efficiency features are featured) How do you market these features that improve the energy efficiency of your homes?

4. What energy efficient features do customers generally ask for?

5a. Are there any energy efficient features that your competitors use that you do not?

5b. (If yes) what are they?

5c. Why do you choose not to include these items?

Awareness of Title 24 Requirements

6. Does your firm rely on any other organizations to ensure that your homes meet Title 24 requirements, or is this something you handle internally?

1. We handle this internally
2. We rely on outside sources
3. Both
4. DK/no response

(If respondent answered 2 or 3:)

7. Where do you get information/assistance on Title 24 issues?

1. General contractor
2. Subcontractor
3. Title 24 consultant
4. Architect
5. Manufacturer/distributor
6. Utility
7. Other _____

8. Is this assistance generally adequate for your needs? Are there any gaps in this information? (Probe to determine what else is needed.)

9. Have you heard that the Title 24 standards for new home construction are being made more stringent?

10. How will these changes affect the homes that your firm builds?
(probe for specific knowledge of standards)

Training Practices and Opportunities

11. In general, what types of training does your staff take part in during a typical year?

12. Thinking specifically about any technical training that your staff may take part in, who conducts this training, and where does it occur?

13. Who provides this type of training? Are there some sources that are better than others?

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14. Last year, how many workshops/classes did your firm participate in?

15. How many of your employees attended these training sessions?

16. Which types of training do you find to be most useful to your firm? What topics, if any, are missing from training that is available to staff at your firm?

Evaluation of Training Opportunities

17. Has your firm sent employees to training sessions sponsored by CBIA (California Building Industry Association) or the local Homebuilders Association?

1. Yes
2. No
3. DK

18. Has your firm sent employees to training sessions sponsored by your local electric utility?

1. Yes
2. No
3. DK

19. Which type of utility training workshop did your employees attend?

a. Sales training
b. Building Energy Code Training
c. Duct testing/sealing
d. HVAC
e. Windows
f. Other _____
g. (Note which utility was the sponsor of the training workshops attended.)

CBIA Training

20. On a scale of 1 to 10 where 1 is of no value and 10 is highly valuable, how valuable would you say the information provided in the CBIA training has been to your firm and its employees?

1 2 3 4 5 6 7 8 9 10 DK

21. Why did you give this rating to the CBIA training?

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22. In your recollection, what were the major topics covered by this training course?
Insulation/infiltration specifications

1. Windows specifications
2. Space conditioning specifications
3. Plumbing specifications
4. Contractor/inspection checklists
5. Title 24 requirements
6. Installation procedures
7. Other _____

23. Which elements of this training have been the most value to your firm?

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24. Can you give me any examples of how you have used this information in your business?

BECT

25. On a scale of 1 to 10 where 1 is of no value and 10 is highly valuable, how valuable would you say the information provided in the Builder Energy Code Training has been to your firm and its employees?

1 2 3 4 5 6 7 8 9 10 DK

26. Why did you give this rating to the BECT training?

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27. In your recollection, what were the major topics covered by this training course?
Insulation/infiltration specifications

1. Windows specifications
2. Space conditioning specifications
3. Plumbing specifications
4. Contractor/inspection checklists
5. Title 24 requirements
6. Installation procedures
7. Other _____

28. Which elements of this training have been of the most value to your firm?

29. Can you give me any examples of how you have used this information in your business?

Sales Agent Training

30. On a scale of 1 to 10 where 1 is of no value and 10 is highly valuable, how valuable would you say the information provided in the sales agent training has been to your firm and its employees?

1 2 3 4 5 6 7 8 9 10 DK

31. Why did you give this rating to the training?

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32. In your recollection, what were the major topics covered by this training course?

1. Insulation features and benefits
2. Window features and benefits
3. Space conditioning features and benefits
4. Lighting features and benefits
5. Appliances features and benefits
6. Efficiency programs
7. Other _____

33. Which elements of this training have been of the most value to your firm?

34. Can you give me any examples of how you have used this information in your business?

HVAC and Duct Training

35. On a scale of 1 to 10 where 1 is of no value and 10 is highly valuable, how valuable would you say the information provided in the HVAC and duct training has been to your firm and its employees?

1 2 3 4 5 6 7 8 9 10 DK

36. Why did you give this rating to the HVAC/duct training?

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37. In your recollection, what were the major topics covered by this training course?

1. Space conditioning specifications
2. Title 24 requirements
3. Sizing
4. Refrigerant/Charging
5. Duct sealing
6. Duct testing
7. Diagnostic techniques, general
8. Installation procedures, general
9. Other _____

38. Which elements of this training have been of the most value to your firm?

39. Can you give me any examples of how you have used this information in your business?

Windows Training

40. On a scale of 1 to 10 where 1 is of no value and 10 is highly valuable, how valuable would you say the information provided in the windows training has been to your firm and its employees?

1 2 3 4 5 6 7 8 9 10 DK

41. Why did you give this rating to the windows training?

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42. In your recollection, what were the major topics covered by this training course?

1. Features of energy efficient windows, general
2. U factor, R value
3. Double or triple glazing
4. Argon fill
5. Coatings
6. Frame materials
7. Title 24 requirements
8. Installation procedures
9. Labeling
10. Other _____

43. Which elements of this training have been of the most value to your firm?

44. Can you give me any examples of how you have used this information in your business?

Recommendations

45. Are there any ways in which the training provided by the utilities could be improved?

46. Are there any additional topics which you would like to see covered in future training workshops?

47. Do you have any preferences for where or when training sessions be held?

Program Awareness and Suggestions

48a. Are you aware of the _____ (Comfort wise, Comfort Home, Energy Advantage Home) program?

48b. (If yes) Have you participated in this program?

48c. (If no) Why not?

49a. Are you aware of the Energy Star program?

49b. (If yes) Have you participated in this program?

49c. (If no) Why not?

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50. Are these programs relevant to your business? Do they make an impact?

51. Are there any other steps the utility companies could take to assist builders in meeting the new Title 24 standards for single family homes? (responses do not need to focus on training issues)

Firm Characteristics

52. Approximately how many homes do you build each year? _____

53. Approximately how many employees does your firm employ on a full-time basis?_____

54. How many years has your firm been in business?_____

Thank you for taking the time to answer these questions. Your answers will help the utilities to refine their programs and services to better serve you in the future.