STATEWIDE RESIDENTIAL NEW CONSTRUCTION UTILITY PROGRAM COMPARISON STUDY FINAL REPORT

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May 31, 2000

California State-Level Market Assessment and Evaluation Study
Project Managers: Michael Sedmak, Quantum Consulting
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Statewide Residential New Construction Utility Program Comparison Study

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STATEWIDE RESIDENTIAL NEW CONSTRUCTION UTILITY PROGRAM COMPARISON STUDY

FINAL REPORT

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TABLE OF CONTENTS

Section Page

EXECUTIVE SUMMARY

STUDY GOALS

The goal of this project is to assess the effectiveness of existing utility residential new construction (RNC) programs in meeting near-term market effects milestones in the context of an evolving RNC program framework. There are three stages to this assessment, culminating in strategic recommendations for integration and refinement of future RNC programs.

- Characterization of the current status of California utilities' RNC programs, including both 1999 and planned 2000 programs as well as market effects indicators.

- Assessment of the California RNC market and the role of utility programs in that market, viewed in the context of a product adoption model that helps explain the current status of the market effects indicators described above.

- Implications of the above findings for future programs targeted to the RNC market, including identifying market effects indicators to measure progress.

STUDY METHOD

This study drew on existing data sources as well as primary data collection activities, including in-depth interviews with RNC program staff at the California utilities, quantitative interviews with 226 new homebuyers, and in-depth interviews with a range of supply-side market actors across California. The emphasis was on new single family detached (SFD) tract homes (as opposed to custom homes, condominiums, etc.) — the primary target for the programs.

CURRENT STATUS OF RNC PROGRAMS

Past programs targeted market actors in each utility's service territory (as opposed to a coordinated, statewide effort), but used (and continue to use) similar intervention strategies. With the exception of the SoCalGas program,[1] the PY99 RNC programs all have some connection with ENERGY STAR® by way of energy efficiency criteria. In addition, statewide supply-side market actor training from the whole-house perspective and Builder Resource Guides (BRGs) were developed and implemented by all utilities in concert.

ANALYTICAL FRAMEWORK

The analytical framework applied to the present study emphasizes the linkages between specific market actors, market barriers, adoption stages, interventions, and indicators. Analyzing potential and current programs within this broader market context provides

[1] In 1999 SoCalGas signed a memo of understanding with the EPA to become an ENERGY STAR® ally on a going-forward basis.

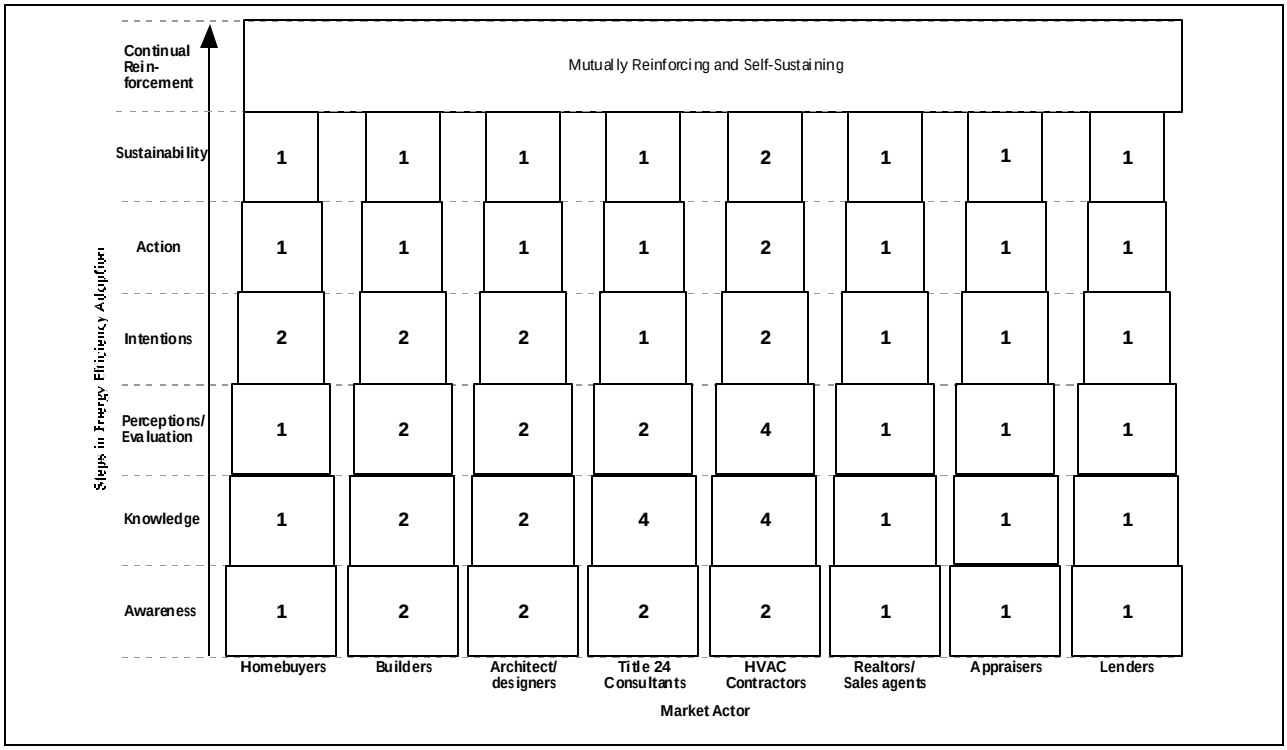
important insights into how the interactions of individual market actors can either inhibit or promote the adoption of the targeted technologies, and how intervention strategies can be most effectively integrated.

While incorporating all elements of the commonly accepted market transformation framework, this approach also includes the classical product adoption model. For both supply-side market actors and end users, the adoption model presumes a fairly orderly sequence of stages that market actors must move through in order for sustained market transformation to occur. The extent to which market actors have moved along these stages is used in this study as a key indicator of the extent to which market transformation has occurred.

ANALYSIS RESULTS AND CONCLUSIONS

A visual summary of study findings is presented in Exhibit ES-1. The results show a moderate degree of awareness and knowledge of RNC energy efficiency issues among the market actors who design and build new homes, but not among those who buy, sell, appraise, or finance them, indicating that RNC program efforts to date (and efforts of related programs) have been most successful with builders, architects / designers, and HVAC contractors. Homebuyers, on the other hand, show very limited awareness and knowledge of energy efficiency as a result of the programs, although there is a moderate level of intent to investigate energy efficient options in the future.

Exhibit ES-1
Overview of RNC Energy Efficiency Adoption Status



KEY	
4	Strong Attainment
2	Moderate Attainment
1	Weak Attainment

In interpreting these results it is important to note that the conclusions are based on primary research interviews with a small number of market actors. (As illustrated in Exhibit 1-2 in the main report, this is especially true for nonparticipating builders.) Additional market actors (especially builders) need to be interviewed to arrive at more robust recommendations.

Based on analysis results, we conclude that supply-side market actors promote energy-efficient home approaches as much as they believe the market will bear, and to the extent that this effort is positive (or at worst, neutral) with respect to their economic well-being. Since homebuyers, although reporting a moderate level of interest in energy efficiency, report a limited willingness to pay extra for it, the upstream value chain responds to this lack of a market signal and limits its emphasis on energy efficiency. These findings highlight the importance of homebuyer preference and willingness to pay for energy efficiency as necessary conditions to further market effects, indicating a need for ongoing program efforts to address critical buyer awareness and knowledge stages in the adoption process.

RECOMMENDATIONS

Overall, the study data suggest that PG&E and its Comfort Home program are the most visible (in terms of program awareness, training session awareness and attendance), SoCalGas and its Energy Advantage Home (EAH) program also are relatively visible, and the SCE and SDG&E ComfortWise programs appear less familiar to their markets.[2] This finding underscores the importance of visible, consistent, appropriately branded sponsor commitment over time.

Going forward, this kind of sustained commitment could possibly be applied on a statewide, cross-utility basis. Integration of individual utility programs should be considered. The benefits of such integration must, of course, be weighed against the increased integration and program maintenance costs that may result.

In addition to a more integrated approach, the following recommendations are offered regarding program design:

- Future RNC programs should address critically important demand-side barriers related to homebuyer awareness and knowledge regarding energy efficiency. Similar information-related barriers will also have to be overcome for appraisers and lenders if energy efficient mortgages (EEMs) and capitalization of energy savings are to be successfully used as program tactics.

[2] The main reason why recognition is higher with the Comfort Home and EAH programs is the relative longevity of these programs. Both the Comfort Home and EAH programs have been in existence for at least seven years, as compared to less than two years for the ComfortWise program. In addition, the 1999 budget for Comfort Home was approximately $7 million, versus $2.2 and $1.8 million for the SDG&E and SCE versions of the ComfortWise program.

- Buyer demand appears to be the key to RNC market transformation, and may depend on buyer ability to capitalize the value of energy efficiency and see that value reflected in their mortgage. In addition to development and promotion of a unified approach to EEMs across the state, efforts should be made to quantify the value of energy efficiency as a standard part of home appraisals.
- A study of recent and/or imminent homebuyers should be considered to identify segments with the greatest interest in energy efficiency.
- Program planners should explore ways that architects and HVAC contractors can be allied to reinforce each other's positive influence on tract home efficiency.
- Emphasis should continue to be placed on targeting consumer "event segments" to identify and influence consumers who are shopping for a new home in the near term.

Several additional progress tracking indicators are recommended to help assess the extent to which RNC programs are transforming their target market. Examples related to current utility-filed indicators are provided below.

- Additional indicators related to the ENERGY STAR® program include increased builder knowledge of ENERGY STAR® efficiency criteria a given number of months after training, as well as observed and self-reported builder changes in new home design and construction practices attributed to ENERGY STAR®. Builders can also be asked to assess the evolving value of the ENERGY STAR® brand in marketing.

- In addition, several indicators are proposed to determine whether the goals filed as program milestones are in fact achieving the desired effects in the market. For example:
  - The number of Builder Resource Guides distributed should be followed up with data on the frequency and value of BRG use as reported by builders.
  - The number of training sessions held for window/duct contractors or sales agents should be followed up with an assessment of the increased knowledge of energy efficiency reported by the attendees and attributed to the training.
  - The number of publications mailed, calls received/made, and advertising pages placed all help measure the extent of program activity; these measures should be followed up by an assessment of increased home buyer knowledge of the content of the information materials distributed, including correcting popular misconceptions such as the belief that all new homes are energy efficient.

Linking indicators directly to key stages in the product adoption process — as discussed in detail in Chapter 3 — is strongly recommended.

Since this report was completed, both SDG&E's ComfortWise and SoCalGas's EAH programs are being redesigned. SDG&E is currently working with the CEC, CHEERS and EPA to redesign their program. SoCalGas has been working with the CEC to redesign their program.

1. INTRODUCTION

1.1 STUDY AND REPORT OVERVIEW

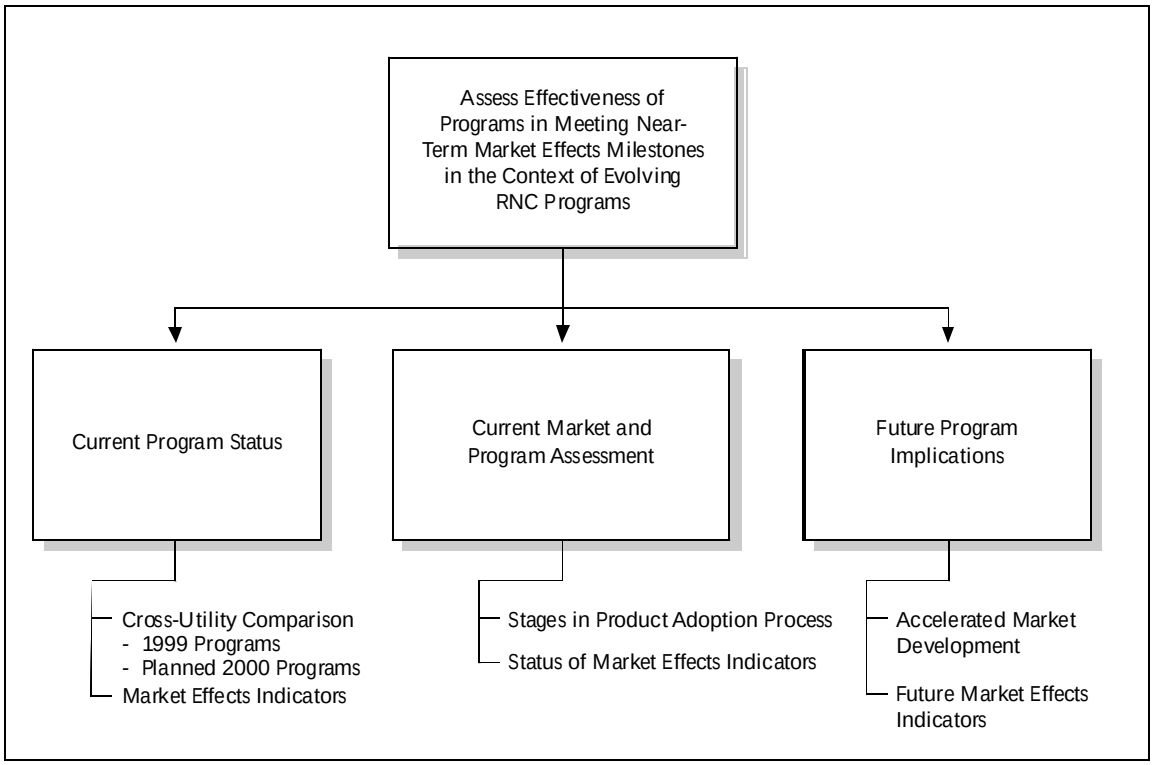
Results of the 1999 California Residential New Construction (RNC) Utility Program Comparison Study are presented in this report. The overall goal of this project is to assess the effectiveness of existing utility RNC programs in meeting near-term market effects milestones in the context of an evolving RNC program framework. As illustrated in Exhibit 1-1, there are three stages to this assessment, culminating in strategic recommendations for integration and refinement of future RNC programs.

- Characterization of the current status of California utilities' RNC programs, including both 1999 and planned 2000 programs as well as market effects indicators.

- Assessment of the California RNC market and the role of utility programs in that market, viewed in the context of a product adoption model that helps explain the current status of the market effects indicators described above.

- Implications of the above findings for future programs targeted to the RNC market, including identifying intended market effects and indicators that will measure progress toward those effects.

Exhibit 1-1
Utility RNC Program Goals and Objectives



This report is designed to provide the statewide RNC working group with the findings of a review of secondary data as well as the results of the collection and analysis of primary data. The remainder of this report is organized as follows:

- In the balance of this chapter, a brief overview is presented of secondary data sources and primary data collection efforts that contributed to the analysis.

- In Chapter 2, California new construction programs offered in 1999 and planned for 2000 by the major utilities are reviewed for similarities, differences, and indicators of desired market effects. Tables classifying and comparing the utilities' respective RNC program elements, associated budgets, and primary progress indicators are also included.

- In the third chapter, the current RNC market and the manner in which the programs described in Chapter 2 influence that market are discussed. Market effects indicators are linked to specific market actors, barriers, and stages in the adoption process. Where possible, a quantitative assessment of the current status of each market effects indicator, relative to long-term goals, also is provided.

- Finally, Chapter 4 contains a discussion of implications for future RNC program design, implementation, and assessment, including recommended strategies for each.

- Supporting data are presented in the appendices, along with the data collection instruments used for both supply-side interviews and customer surveys.

1.2 STUDY METHOD

This study drew on a number of existing data sources to develop preliminary hypotheses regarding the structure and functioning of utility programs in the RNC market, and then used data collected from a wide range of market actors to test and refine those hypotheses and develop a final assessment of program effectiveness.

1.2.1 Review of Secondary Data

As a first step in the study, program descriptions and other existing data relevant to the RNC market were reviewed and analyzed. The most useful existing sources of information on the RNC market and utility programs included program filings and previous RNC program and market assessments. Most of the filed milestone progress indicators were measurable via utility program activity records, and these utility-provided program data are included where appropriate in this report in their most current form.

1.2.2 Primary Data Collection

Primary data collection activities are summarized in Exhibit 1-2.

Exhibit 1-2
Primary Research Interview Counts

	Utility Service Territory			
	PG&E	SCE/SCG	SDG&E	Total
Utility Program Staff	1	2	2[1]	5
Customers (recent home buyers)	75	75	76	226
Production Builders/ Developers (PY99 Participants)	4	2 / 1	0	7
Production Builders/ Developers (Non-Parts)	4	3	0	7
Realtors/Sales Agents	6	7	2	15
Lenders	6	4	5	15
HVAC Subcontractors	6	5	4	15
Appraisers	3	3	2	8
Title 24 Consultants	3	3	2	8
Architects/designers (integrated EE design)	7	7	1	15

As shown in the exhibit, primary data collection activities included the following.

- In-depth interviews with key RNC program staff at PG&E, Southern California Edison (SCE), SoCalGas, and SDG&E

- Quantitative interviews with 226 new homebuyers across California, emphasizing awareness and knowledge of RNC programs and energy efficiency (EE) criteria; perceptions of EE programs, products, and barriers; intentions and actions regarding efficient new home purchases; and respondent demographics.

- Structured depth interviews with a range of supply-side market actors across California to gather information on awareness and knowledge of RNC programs and/or EE criteria; perceptions of EE programs, products, and barriers; intentions and actions regarding efficient new home design, installation, and/or marketing; and respondent firmographics.

[1] Includes ComfortWise outsource provider

The emphasis of this evaluation was on new single family detached (SFD) tract homes (as opposed to custom homes, condominiums, etc.), since this was the primary target for the programs. Where possible, survey and interview questions were constructed in the same form as in recent California (or other) RNC assessments, so that 1999 RNC program progress can be benchmarked against these other sources.[2] Note that these preceding studies were designed to address related, yet distinct, evaluation objectives. As a result, none are perfectly comparable to each other or to this study, due to variations in populations surveyed, data collection method, and question specifics.

Interview guides and the names of utility staff interviewed for this study are included in the appendices.

[2] These benchmarking studies included RER's PY1998 PG&E Comfort Home Program Market Baseline and Market Effects Study, RER's June 1998 Residential Market Effects Study conducted on behalf of SoCalGas and SDG&E, and the 1997 Residential New Construction: Market Transformation Study, conducted for PG&E and SCE by Barakat & Chamberlin, Inc. Selected questions also were chosen for comparability to New England market transformation efforts.

2. OVERVIEW OF CALIFORNIA'S RESIDENTIAL NEW CONSTRUCTION PROGRAMS

This chapter provides a description of California's RNC programs, highlighting PY99 program design similarities and differences among the utilities. While the emphasis of this study is on current programs, these programs must be seen in the context of the decade-long history of RNC programs in the state; each California utility has implemented RNC programs over most or all of the 1990s, and each has a program in place today.

2.1 CURRENT STATUS OF RNC PROGRAMS

While past programs targeted market actors in each utility's service territory (as opposed to a coordinated, statewide effort), intervention strategies have been similar across utilities, which may explain some of the similarities in PY 1999 California RNC program designs. The full range of program elements being used by utilities in their PY 1999 program (and associated budgets) is presented in Exhibit 2-1. Definitions of the interventions strategies being used by the utilities are given in Exhibit 2-2.

- With the exception of the SoCalGas program,[1] the PY99 RNC programs have some connection with ENERGY STAR® by way of energy efficiency criteria. The ENERGY STAR® program requires homes to exceed the BOCA Model Energy Code (MEC) by at least 30 percent, but does not dictate which measures must be used to meet those goals.

- In addition to the utility-specific program elements, statewide supply-side market actor training from the "whole-house" perspective and Builder Resource Guides (BRGs) were developed and implemented by all utilities in concert.

Individual utility programs are discussed below.

[1] In 1999 SoCalGas signed a memo of understanding with the EPA to become an ENERGY STAR® ally on a going-forward basis.

Exhibit 2-1
1999 Residential New Construction Program

Program Element	1999 Budget by Utility (1,000s)				Intervention Strategies (primary adoption stage targeted)								Summary Notes
	PG&E	SCE	SDG&E	So Cal Gas	Training and Technical Assistance (builder/sub knowledge - to participate/sell)	Statewide Builder Guide (builders - to comply)	CHEERS (primarily reinforces builder perception/evaluation and intent)	Offer Energy Star to Developers (primarily inducing short-term builder action)	Financial Incentives (to builders - induce short-term action)	Promotion (consumer awareness)	Information, Marketing, and Education (consumer knowledge)	PIER (builder's awareness of emerging EE technologies)	
Primarily/exclusively builder/supply-side													
Capability Development	550				4								PG&E has licensed some established training to other utilities, as part of statewide training sub-element. Emphasis on builder, sales agent, and subcontractor education about EE measures and benefits.
						1							BRG's (Builder Resource Guide) were distributed beginning in October 1999.
			150									1	SDG&E is working with the San Diego Regional Office (SDREO) in assessing the availability of new and emerging technologies, with the plan of introducing technologies to the appropriate market implementers and possibly conducting limited demonstrations.
Infrastructure and Product Development (links to Comfort Homes for PG&E)	450						2						Some Comfort Homes builders do not do program paperwork, so CHEERS does not happen and compliance is not verified. PG&E's perception is that some builders want to portray homes as energy-efficient without having to confirm/prove it to buyers.
		Part of CW	150				1						No ComfortWise homes have been built as of October 1999, although ConSol is a CHEERS rater and has non-CW CHEERS experience.
Statewide Energy Efficiency Initiative		200			4	1							Although SCE was the only utility that listed "statewide initiatives," it appears to correspond to the statewide training and BRG sub-elements that are otherwise categorized in other utilities' program elements. As with all utilities, the BRG is just starting distribution in October.
Mixed builder/supply-side & homebuyer													
Market Leader Incentives/ Comfort Homes	3,500				4				4	1	1		Third-party allies (e.g., contractors) are incented ($25/unit committed) to promote Comfort Home to builders. These allies have to attend CH-related training first so they can accurately portray the features and benefits of CH homes.
Energy Star Showcase Homes	500							1	1				Builders are incented $3000-$5000 (depending on climate zone) to participate by showcasing an Energy Star model home. There apparently is no incremental promotion of Energy Star showcase homes, beyond "piggybacking" on promotions for Comfort Home developments (though the ES logo is shown, it is not emphasized in CH promotions).
ComfortWise (Consol turn-key) - includes SDG&E MLI - 50% of builder CW cost defrayed		1,525	1,600		4		1						ConSol handles builder and ally elements turn-key, has no direct interactions with or promotions to homebuyers. Builder training, technical assistance in optimizing EE design, quality assurance (including CHEERS), and related callback minimization, are the core benefits that builders pay $400 a house to Consol. SDG&E defrays $200 per house.
ComfortWise (Consol TPI - discontinued in PY2000)				220	X		X						For SCG, ComfortWise was a PY99 TPI program combined with Energy Advantage for budget/administrative purposes - there was no functional PY99 link between the two programs. There is no SCG ComfortWise funding in PY2000.
Primarily/exclusively homebuyer													
Energy Advantage New Home (predominantly event segment-targeted)				3,205	4	1				4	4		Energy Advantage emphasizes a consumer pull strategy, via direct and event segment-targeted marketing of EE benefits to consumers. SCG pays no incentives to any market actors, and they do their own verification (not CHEERS). The program also leverages the statewide training and BRG resources. SCG also heavily leverages its brand/logo and program history/continuity in consumer promotion.
General Consumer Promotion and Information (links to Comfort Homes)	1,875									2	2		PG&E promotes Comfort Home as the flagship program brand, with PG&E and Energy Star as supporting/validating brands. PG&E has concerns about shifting aggressively toward Energy Star branding, because of nebulous public perceptions of the ES brand. Current strategy maintains option for more gradual bridging from CH to ES brand. PG&E's consumer promotion activities seem the most mass/broad-based, and the least oriented toward direct marketing and event segment-targeting.
Targeted (to "event segment") Consumer Promotion and Information		Part of MLI/CW	Part of MLI/CW	Part of EAH						2	2		SCE and SDG&E generally fund a mix of event segment and more mass media promotion of ComfortWise. SCG appears to have the most emphasis on event segment targeting and direct marketing tactics, in supporting Energy Advantage.

KEY

4	Well-established intervention
2	Developmental intervention
1	Recently implemented intervention
X	Being phased out in 2000

Exhibit 2-2
Intervention Strategy Definitions

Intervention Strategies (primary adoption stage targeted)	Definition of Intervention Strategy
Training and Technical Assistance (builder/sub knowledge - HOW to comply)	Includes statewide and utility-specific builder and other market actor training. Also includes technical design and quality control assistance provided by ConSol through ComfortWise for a fee.
Statewide Builder Guide (builders - HOW to comply)	Builder Resource Guides (BRGs) for builders and developers.
CHEERS (primarily reinforces builder perception/evaluation and intent)	The California Home Energy Efficiency Rating System is a part of both the Comfort Home and the ComfortWise programs. This inspection is required to qualify the home for an Energy Efficient Mortgage, and also certifies that the home meets the standards as required by the program.
Offer Energy Star to Developers (primarily inducing short-term builder action)	PG&E offers incentives (see financial incentives below) for builders to showcase a qualified Energy Star model home in builder developments and Energy Star would be sold as an upgrade option to customers.
Financial Incentives (to builders - induce short-term action)	Incentives to 3rd party builder allies to encourage builder program participation and development of industry relationships built on energy efficiency (For PG&E's Comfort Home); also, PG&E incentives to builders of efficient model homes to promote Energy Star and emerging technologies. (ComfortWise through SDG&E because of 50% cost defrayment)
Promotion (consumer awareness)	Advertising about general EE benefits and availability of core program elements - Comfort Home (PG&E), ComfortWise (SCE, SDG&E), and Energy Advantage Home (SoCal Gas). Also includes promotion/leveraging of supporting utility and Energy Star brands (to varying extents by utility).
Information, Marketing, and Education (consumer knowledge)	Collateral supporting core programs; also pertains to any event segment or direct marketing that moves beyond general EE and/or program awareness generation, to impart more specific EE and/or program features and benefits.
PIER (builder's awareness of emerging technologies)	Working with the CEC's Public Interest Energy Research Program (PIER) in advancement of new energy efficient technologies (from PY99 3rd Quarter Update).

2.1.1 PG&E Comfort Home

PG&E's Comfort Home program promotes tight ducts, gas ranges and dryer stubs, and high-efficiency AC units. While qualifying program homes do not necessarily meet the ENERGY STAR® benchmark, the upgrades required by the program help move the home towards the higher benchmark levels. Like the ComfortWise program fielded by SCE and SDG&E, the Comfort Home program uses the Certified Home Energy Efficiency Rating System (CHEERS) method of inspecting and rating new homes for energy efficiency. There are, however, several key distinctions between the Comfort Home and ComfortWise programs:

- In PY99, the ComfortWise program focused only on production (tract) SFD builders, while PG&E's Comfort Home program was accessible to custom as well as tract builders; there were also more builders in the Comfort Home program.

- PG&E's sales staff was reduced in 1999, which resulted in PY99 emphasis on program training for supply-side allies who act as *de facto* sales agents. These supply-side allies — primarily Title 24 consultants and HVAC and window contractors — can apply for a $25 incentive for each Comfort Home approved and built by a builder they enroll in the program.

- PG&E's Energy Star Showcase Home Program also pays incentives of $3,000 to $5,000 for one model home that meets Energy Star criteria. This helps to defray the cost of the upgrades and allows the builder to offer the Energy Star model as an upgrade option to the consumer.

PG&E program staff indicate that, over time, they would like to migrate from the ComfortHome brand toward the ENERGY STAR® brand. However, there is concern that ENERGY STAR® standards are perceived by buyers, lenders, and other market actors as somewhat nebulous, and by builders as an offshoot of the federal bureaucracy.

2.1.2 SCE and SDG&E ComfortWise

ComfortWise (CW) is the core PY99 RNC program element for both SCE and SDG&E. While both utilities invest in CW program promotion to consumers, the primary focus of this program is on builders. The Consol ComfortWise team works with builders to provide design and technical assistance, training, and high-quality inspections at key points during the design-build process. In this way, the ComfortWise team acts almost as a commissioning agent, providing checkpoint inspections and ensuring quality regarding energy-related construction elements. In turn, this is intended to result in greater buyer comfort and energy efficiency, and fewer builder callbacks (reducing builder liability and thus saving them money). Unlike the other California RNC programs, Consul ComfortWise team requires the builder to pay a per-home participation fee ($400 per home through SCE, $200 per home through SDG&E because of subsidies they provide).

In addition to the support ComfortWise offers builders, it also provides marketing and advertising to consumers, to whom the main selling point is comfort, not energy efficiency. Because this promotion is funded by SCE and SDG&E, the participating builder receives the added support of utility brand equity and resulting consumer trust and confidence.

ComfortWise uses ENERGY STAR® as a benchmark because of its brand equity, visibility, and standards consistency; program managers do not perceive the standards themselves to be highly effective in California's diverse climate zones. In essence, a ComfortWise home complies with ENERGY STAR® criteria and has spectrally selective windows and a tight duct system. ComfortWise involves inspection of all energy-consuming aspects of the house, adding further value to the home above the ENERGY STAR® standards. As with the Comfort Home program, CHEERS is used to inspect ComfortWise homes and verify their energy efficiency.

2.1.3 SoCalGas Energy Advantage Home (EAH)

The SoCalGas Energy Advantage Home (EAH) program is unique among California RNC programs: it pays no incentives, is more focused on targeted consumer education and

information, more explicitly leverages the utility brand, and segments and targets prospective homebuyers. Also, the PY99 EAH program inspects and verifies a sample of participating homes using SoCalGas staff, not the CHEERS raters used in the other RNC programs. SoCalGas staff believe that its visible brand and the continuity of EAH are strong program selling points to builders, along with sales training and targeted consumer advertising and promotion.

The EAH program emphasizes standard Title 24 compliance measures, particularly gas space and water heaters. SoCalGas has worked with the *L. A. Times* and other media sources to target consumer promotions to potential homebuyers throughout its service territory. This included targeted direct mail campaigns and links to LATimes.com during 1999. Marketing for the EAH program appeared more focused than for the other programs, in that various strategies were used to target and communicate with "event segment" members (i.e., the specific households who were shopping for a home at that time).

2.2 PROGRAM PROGRESS INDICATORS

Exhibit 2-3 expands upon Exhibit 2-1 to include utility program intervention-level progress indicators from program filings, as well as quantitative compliance stretch goals and progress toward these goals as of late 1999. The progress indicators are grouped by stage of the product adoption process (discussed in more detail in Chapter 3) and market actor.

The more activity- or process-oriented progress indicators are discussed here because they represent a measure of how actively the programs are being implemented. The more outcome-oriented indicators (i.e., indicators such as increased homebuyer or builder knowledge) are discussed in Chapter 3 with other market effects indicators.

In general, when interviewed in the fall of 1999, program managers were most focused on the practical progress indicators reflecting the number of program builders, developments, and home commitments. As shown Exhibit 2-3, these indicators provide evidence that goals are generally being met and that the utility's programs are being aggressively implemented.

- PG&E, for example, has obtained seven ENERGY STAR® Showcase Home commitments from three builders (each of whom has committed to building all homes in their developments to ENERGY STAR® standards). In addition, 1,500 ENERGY STAR® homes will be built through 2000, including 110 that have been CHEERS rated and tested.

- SCE has commitments for 4,347 homes across 20 builders and 38 developments, while SDG&E has 2,016 ComfortWise homes among 13 builders. In 1999, SoCalGas had 261 participating buildiners and signed 490 contracts for more than 36,000 Energy Advantage New Homes.[2]

- Across all utilities, more than 500 Builders Resource Guides have been distributed.

[2] It should be noted that for a home to qualify for the Energy Advantage New Homes Program, it must only have gas space and water heaters that exceed the minimum efficiency levels contained in Title 24.

- Training has been conducted both for builder sales agents and for builder trade allies (subcontractors).

With the exception of the SoCalGas ComfortWise third-party initiative, as shown in Exhibit 2-1, other programs are continuing essentially unchanged for 2000. The extent to which these activities have resulted in changes to results-oriented market effects indicators is examined in Chapter 3.

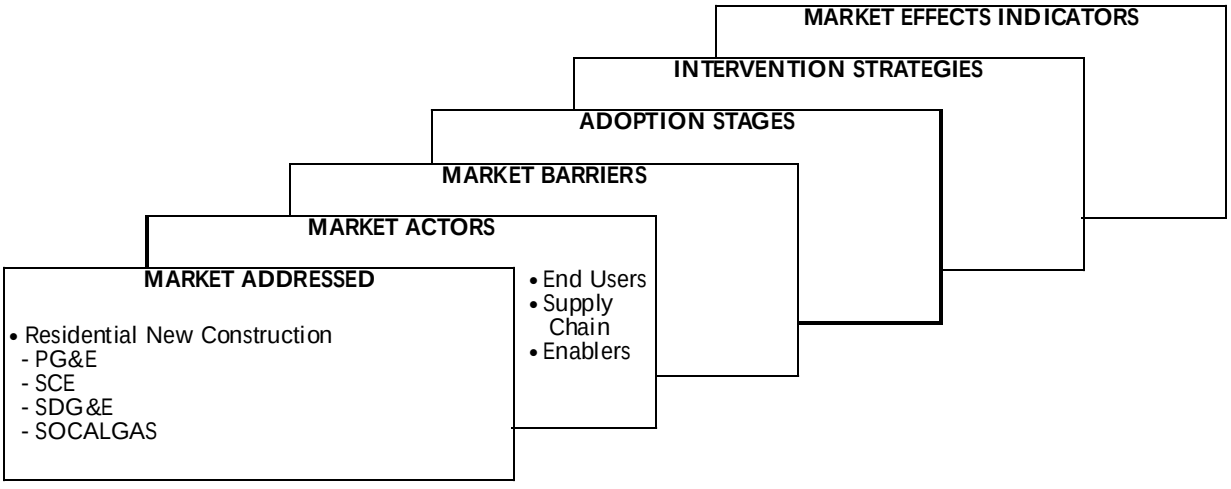
3. CURRENT PROGRAMS AND THE CALIFORNIA RNC MARKET

In this chapter, the effects of current utility programs on the California RNC market are assessed, using an analytical framework that combines the classical product adoption model with established market transformation theory. First, the analytical framework is laid out and explained, emphasizing the integration of market actors, market barriers and interventions, and market effects indicators. Next, the framework is applied to the California RNC market, using primary data collected from a range of market actors to determine the extent to which desired market effects have been achieved. Finally, these same data are used to assess the results-oriented goals incorporated into individual utility filings.

3.1 OVERVIEW OF THE ANALYTICAL FRAMEWORK

Exhibit 3-1 below summarizes the elements of the analytical framework that was applied to the RNC market for the present study. This approach emphasizes the linkages between specific market actors, market barriers, adoption stages, interventions, and indicators. Analyzing potential and current programs within this broader market context provides important insights into how the interactions of individual market actors can either inhibit or promote the adoption of the targeted technologies, and how intervention strategies can be most effectively integrated.

Exhibit 3-1
Elements of Market Transformation Framework – RNC Market



While incorporating all elements of the commonly accepted market transformation framework, this approach also includes the classical product adoption model. For both supply-side market actors and end users, the adoption model presumes a fairly orderly sequence of stages that market actors must move through in order for sustained market transformation to occur. The extent to which market actors have moved along these stages is

used in this study as a key indicator of the extent to which market transformation has occurred.

3.1.1 Market Actor Identification/Verification

Each type of market actor was identified, and an initial assessment of their relative importance in influencing the desired outcome (i.e., purchase, etc.) was made. In the RNC context, homebuyers and builders emerge as the primary market actors, in terms of their influence on the desired outcome, availability, and purchase of energy efficient homes. Secondary market actors, based on their level of influence, include architect / designers, HVAC contractors, realtors / sales agents, lenders, appraisers, and Title 24 consultants.

3.1.2 Market Barrier Identification and Mapping to Market Actors

Once market actor roles were determined, barriers to more efficient residential new construction were identified and prioritized for each market actor. Barriers were assessed in subjective terms; that is, market actors were asked about their perceptions of market barriers, and these perceptions were taken at face value. Although, given adequate resources, a more objective perspective of market barriers could have been drawn from market data, (for example, the share of shelf facings filled by CFLs provides objective information about the product unavailability barrier), market actor perceptions of barriers were used to provide a consistent measure of the extent of barriers across market actors. These self-reported perceived barriers were generally consistent with objective market barriers for which data were available.

3.1.3 The Energy Efficiency Adoption Model

The adoption model has roots in consumer behavior theory, and has been adapted to apply to all of the market actors involved in the development, delivery, and adoption of energy-efficient products and services. The model posits basic, sequential stages of market acceptance, with sustainable market transformation dependent on achievement of threshold levels at each successive stage. As a result, one would expect different adoption stages to be associated with different primary market barriers, as shown in the illustrative example in Exhibit 3-2 and discussed below.

- Market actors first become **aware** of a need or problem, and link this awareness to one or more potential solutions. Market barriers typically aligned with this stage include information / search costs and supply-side lack of product knowledge (the barriers with solid bullets in the "awareness" column). Buyer distrust of information provided by vendors who are perceived to have ulterior motives (sometimes called asymmetric information / opportunism) also may be a key barrier at the awareness stage.

Exhibit 3-2
Typical Adoption Stage Links to Market Barriers

Objective Market Barriers \ Adoption Stages	Awareness	Knowledge	Perceptions/Evaluations	Intentions	Actions
Information search costs	●	●			
Lack of product knowledge	●	●			
Asymmetric information	●	●	●	●	
Market uncertainties	●	●	●	●	
Performance uncertainties	●	●	●	●	
Perceived low value	●	●	●	●	
High capital costs	●	●	●	●	
Focus too narrow	●	●	●	●	●
Organizational practices			●	●	
Hassle/transaction costs			●	●	●
Hidden costs			●	●	●
Split incentives	●	●	●	●	●
Bounded rationality	●	●			●
Access to financing	●	●		●	●
Title 24			●	●	●
Irreversibility				●	●
Unavailability (real or perceived)				●	●

● Primary Barrier
● Secondary Barrier

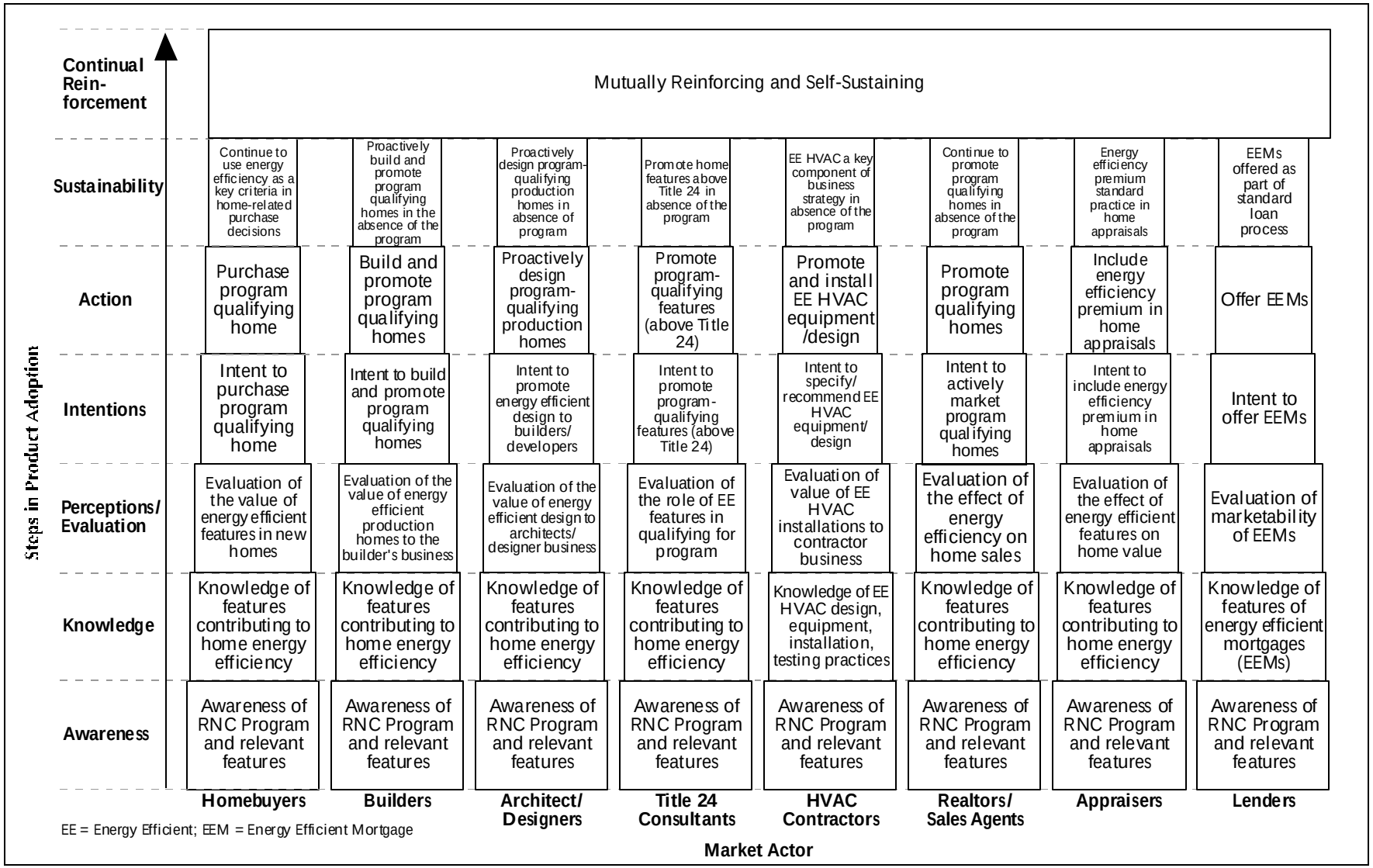
- Once aware market actors seek more detailed **knowledge** of specific solutions, they encounter information/search costs, asymmetric information/opportunism, and supply-side lack of product knowledge barriers, along with a narrow focus among some supply-side market actors that keeps them from exploring alternative solutions.
- Given that market actors are aware and have knowledge of solutions, they will form **perceptions/evaluations** of the potential solutions. Barriers at this stage may include performance uncertainties, supply-side market uncertainties, asymmetric information, high capital costs, and perceived low value (cost-benefit ratio).
- Next, market actors can develop **pre-purchase intentions** toward one or more solutions (for supply-side market actors this can entail intentions to carry, provide information about, and/or recommend efficient solutions). Barriers at this stage potentially include information search costs, lack of product knowledge, asymmetric information, etc.

- To take **action** for RNC homebuyers entails purchase of energy-efficient homes or products, and for builders may mean committing to building homes that exceed Title 24. Barriers might include transaction/hassle costs, hidden costs, split incentives, product or service unavailability, irreversibility, and bounded rationality (behavior inconsistent with goals or self-interest). Title 24 standards can themselves present a barrier because of the explicit threshold they represent.
- **Post-action intentions** involve post-purchase evaluation of energy-efficient investments and lead to market sustainability. Barriers associated with the perception/evaluation and later stages are most relevant to sustainability.

3.1.4 Market Effects Indicators

Exhibit 3-3 defines desired market effects (and, by implication, market effects indicators) for each of the primary RNC market actors at each discrete adoption stage. When populated with the results of the primary data collection and analysis, an exhibit of this type provides a means of visually summarizing the extent to which the California RNC programs have influenced the development of the market in the desired direction. The information available for such an assessment from the primary data collection effort for each adoption stage and each market actor, including the scales used and the number of respondents for each question, is presented in Exhibits 3-4 through 3-9 below, with accompanying discussions. The market actor surveys and interviews used to collect the data are included as Appendix B to this report.

Exhibit 3-3
RNC Production Home Energy Efficiency Adoption Process



3.2 RNC MARKET EFFECTS AND PROGRESS INDICATORS

Key findings regarding the current RNC market and market effects indicators are summarized in this section. The discussion is organized by the discrete adoption stages outlined in the previous section, with two closely linked stages covered in each section (i.e., awareness and knowledge; perceptions/evaluations and intent; actions and sustainability). Within each adoption stage, results are summarized for each market actor segment, and compared (where applicable) across market actors. At the end of the section, findings are incorporated into an integrated assessment of the state of the market similar to that shown in Exhibit 3-3. Supporting data are presented as Appendix A.

In general, the assessment is conducted at a statewide level. Where appropriate, particularly among homebuyers (where quantitative data and adequate sample sizes were obtained), differences by utility service territory are highlighted.

3.2.1 Market Actor Awareness/Knowledge

Findings regarding awareness and knowledge of new construction energy efficiency are summarized in Exhibit 3-4 through 3-5, which present the current status of several indicators associated with these adoption stages.

3.2.1.1 Homebuyers

Homebuyer's unprompted awareness of RNC programs is very low by RNC program name alone (3 percent), but substantially higher when associated with the sponsoring utilities (19 percent). Aided awareness figures were 21 percent for PG&E's Comfort Home, 3 percent for SCE/SDG&E ComfortWise, 11 percent for SoCalGas Energy Advantage Homes, and 18 percent for ENERGY STAR® Homes.

Homebuyers reported a lower amount of knowledge regarding the features of a home that contribute to energy efficiency than did other, supply-side, market actors. The average homebuyer reported two of the relevant criteria, with the most common items mentioned being windows (44 percent), non-specific insulation (27 percent), appliances (23 percent), air conditioners (22 percent), and roof/ceiling insulation (20 percent).

Exhibit 3-4
Additional Progress Tracking Indicators
Awareness

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Awareness					
Homebuyers	Awareness of RNC Program and relevant features	Unaided survey responses	(n=226)		
		Aware of RNC program	3%		
		Aware of RNC or utility program	18%		
		Aware of Energy Star Homes	1%		
		Aided survey responses	(n=226)		
		Aware of PG&E ComfortHome	21%		
		Aware of SCE/SDG&E ComfortWise	3%		
		Aware of SoCalGas EAH	11%		
		Aware of Energy Star Homes	18%		
Builders	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	7 of 14		
		Aware of Energy Star Homes	3 of 14		
		Aware of energy efficient mortgages	7 of 14		
Architects/Designers	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	2 of 15		
		Aware of Energy Star Homes	1 of 15		
		Aware of utility-sponsored training	5 of 15		
		Aided survey responses			
		Aware of PG&E ComfortHome	5 of 7		
		Aware of ComfortWise	2 of 7		
		Aware of SoCalGas EAH	4 of 7		
		Aware of Energy Star Homes	7 of 15		
Title 24 Consultants	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	2 of 8		
		Aware of Energy Star Homes	4 of 8		
		Aware of utility-sponsored training	5 of 8		
		Aware of EEMs	2 of 8		
		Aided survey responses			
		Aware of PG&E ComfortHome	3 of 8		
		Aware of ComfortWise	1 of 8		
		Aware of SoCalGas EAH	1 of 8		
		Aware of Energy Star Homes	2 of 8		
HVAC Contractors	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	5 of 15		
		Aware of Energy Star Homes	3 of 15		
		Aware of utility-sponsored training	6 of 15		
		Aided survey responses			
		Aware of RNC programs	12 of 15		
		Aware of Energy Star Homes	6 of 15		

Exhibit 3-4
Additional Progress Tracking Indicators
Awareness (Continued)

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Realtors/Sales Agents	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	1 of 15		
		Aware of Energy Star Homes	0 of 15		
		Aware of energy efficient mortgages	6 of 15		
		Aware of utility-sponsored training	1 of 15		
		Aided survey responses			
		Aware of PG&E ComfortHome	4 of 15		
		Aware of ComfortWise	2 of 15		
		Aware of SoCalGas EAH	3 of 15		
		Aware of Energy Star Homes	2 of 15		
Appraisers	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	0 of 8		
		Aware of Energy Star Homes	0 of 8		
		Aware of energy efficient mortgages	1 of 8		
		Aware of utility-sponsored training	1 of 8		
		Aware of EE home resale premium	1 of 8		
		Aware of CHEERS	1 of 8		
Lenders	Awareness of RNC Program and relevant features	Unaided survey responses			
		Aware of RNC program	1 of 15		
		Aware of Energy Star Homes	0 of 15		
		Aware of energy efficient mortgages	5 of 15		
		Aware of utility-sponsored training	1 of 15		
		Aware of CHEERS	0 of 15		
		Aware of increase in EE builders	6 of 15		

Exhibit 3-5
Additional Progress Tracking Indicators
Knowledge

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Knowledge (Information)					
Homebuyers	Knowledge of features contributing to home energy efficiency	Mean number of EE criteria mentioned unaided	On average, homebuers able to identify two EE criteria		
		Percent of surveyed homebuyers aware of individual EE features:	(n=226)		
		Windows	44%		
		Non-specific insulation	27%		
		Appliances	23%		
		Air Conditioners	22%		
		Roof/Ceiling insulation	20%		
		Percent of surveyed homebuyers who:	(n=226)		
		know new home EE levels differ	25%		
		know increased EE potential exists	54%		
		know EE HVAC criteria	4%		
		know EE gas furnace criteria	2%		
		know EE gas water heater criteria	3%		
		know EE electric water heater criteria	0		
		know EE ceiling insulation criteria	8%		
		know EE wall insulation criteria	8%		
		know EE window criteria	46%		
Builders	Knowledge of features contributing to home energy efficiency	Mean number of EE criteria mentioned unaided	On average, builders able to identify 2.5 EE criteria		
		Percentage aware of EEMs and know they are available in their area	3 of 14		
		Percent who know RNC program requirements and elements	5 of 14		
Architects/Designers	Knowledge of features contributing to home energy efficiency	Mean number of EE criteria mentioned unaided	On average, architects were able to identify 3.3 EE criteria		
Title 24 Consultants	Knowledge of features contributing to home energy efficiency	Mean number of EE criteria mentioned unaided	On average, T24 consultants were able to identify 3.1 EE criteria		
HVAC Contractors	Knowledge of EE HVAC design, equipment, installation, testing practices	Percent who know EE HVAC criteria	11 of 15		
		Percent who know RNC program requirements and elements	1 of 15		
Realtors/Sales Agents	Knowledge of features contributing to home energy efficiency				
Appraisers	Knowledge of features contributing to home energy efficiency	Mean number of EE features captured in appraisals	On average, appraisers reported capturing 2.3 EE features in their appraisals		
Lenders	Knowledge of features of energy efficient mortgages (EEMs)	Mean number of EE features captured in lender appraisals	On average, lenders say 1.2 EE features are captured in their appraisals		

3.2.1.2 Builders

Builders were more aware of energy efficiency programs than were homebuyers: half of the 14 builders interviewed were able to give the name of the RNC program in their territory. In addition, three of the 14 builders were aware of the ENERGY STAR® Homes Program on an unaided basis, while seven more were aware of it on an aided basis.

Half of the builders reported awareness of energy efficient mortgages (EEMs), including six in PG&E's service territory. Of the three builders who said EEMs were available in their area, only one thought EEMs had been used by 1999 homebuyers; the other two respondents noted that the terms offered by EEMs are not meaningfully different from other loans that buyers can obtain.

Builders' knowledge of the measures that can impact energy efficiency was also higher than that of homebuyers.

- On average, builders cited 2.5 items that contributed to energy efficiency.
- The most commonly mentioned items were windows (mentioned by eight of 14 builders), non-specific insulation (7), and HVAC systems (6). Other items mentioned included attic / whole-house fans, furnace / heating systems, and multiple zones.

3.2.1.3 Architects/Designers

Architects displayed relatively low awareness of specific RNC programs, with only two of 15 able to provide names of such programs; once prompted, however, an additional 11 said they were aware of the programs, and almost half (7 of 15) were aware of Energy Star. Five of the 15 architects were aware of energy efficiency training provided by utilities in 1999; but only two explicitly cited their utility (PG&E, in both cases) as a resource they would go to for help and information on energy-saving design practices.

Architects seemed quite knowledgeable about the home features that contribute to energy efficiency, citing an average of 3.3 such features. The most commonly mentioned features included roof insulation; wall insulation; multi-paned and low-e windows; efficient HVAC, and efficient water heaters.

3.2.1.4 Title 24 Consultants

With a relatively high degree of awareness of the ENERGY STAR® Homes program (four of eight) and of utility-sponsored training (five of eight), Title 24 consultants have the knowledge of energy efficiency drivers and breadth of information sources that would allow them to be a primary supporter of more efficient new homes. Title 24 consultants also displayed a high level of knowledge about the features of a new tract home that contribute to energy efficiency (providing 3.1 examples, on average).

3.2.1.5 HVAC Contractors

HVAC contractors appear very knowledgeable about HVAC system efficiency criteria, and fairly knowledgeable about the home features having the greatest interactive effects with HVAC efficiency (windows and insulation being the most prominent). These contractors had less awareness of utility RNC programs or associated training, and knew very little about RNC or ENERGY STAR® Homes Program participation requirements.

3.2.1.6 Realtors

Unprompted awareness of RNC programs was low for realtors (one of 15), though their prompted awareness was somewhat higher. Six of the 15 realtors were aware of EEMs, but none had used them. A single realtor was aware of utility-sponsored training, but had not attended.

3.2.1.7 Appraisers

None of the eight appraisers interviewed was aware of the utility RNC programs or the ENERGY STAR® Homes program unaided, although one did mention CHEERS. Similarly, only one appraiser was aware of utility training and one was aware of EEMs.

All eight appraisers claim to capture information about home energy use and efficiency, with an average of 2.2 specific features cited as examples. Measures cited included insulation R-values, windows, HVAC SEER, and furnace AFUE.

3.2.1.8 Lenders

Lenders reported market shifts toward more efficient tract homes, but associated those shifts more with builders than with utility programs or influences. Few lenders consider energy efficiency in the loan approval process, and only a minority offer EEMs or plan to do so.

3.2.2 Market Actor Perceptions/Evaluations and Intent

Findings regarding perceptions/evaluations and intent of new construction EE are summarized in Exhibits 3-6 and 3-7, which present the current status of indicators associated with these stages.

3.2.2.1 Homebuyers

On average, new homebuyers place modest importance on energy efficiency and the RNC programs in affecting their home selection, with slightly over one-fourth of respondents saying they considered either factor very important (i.e., 9 or 10 on a 1 to 10 scale).

As shown in Exhibit 3-6, homebuyers' greatest barriers include access to financing and a desire to invest only in energy efficiency features whose value can be capitalized in the home's market value.

Exhibit 3-6
Additional Progress Tracking Indicators
Perceptions/Evaluation

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Perceptions/Evaluation					
Homebuyers	Evaluation of the value of energy efficient features in new homes	Percentage of homebuyers rating EE very important (9 or 10 on a 10-point scale) in home selection	27%		
		Percentage of buyers who actively investigated EE in buying new home	9%		
		Percentage of buyers of RNC program homes rating program sponsorship very important (9 or 10 on a 10-point scale) in home selection	28%		
		Mean response on a 1-10 disagree-agree scale to the following statements:			
		Will invest in money saving features			7.5
		EE must help resale for me to invest			5.5
		EE features cost more than they're worth			3.6
		Too much hassle to find out EE info			4.5
		Don't believe EE info from builders			4.2
		Cost of EE would have to be included in mortgage			5.7
Builders	Evaluation of the value of energy efficient production homes to the builder's business	Mean rating, on a 1 to 5 scale, of:			
		Importance of Energy Star in buyer's home selection		3.2	
		Perceived buyer demand for EE homes		3.5	
		Perceived buyer willingness to pay for EE		2.9	
		Perceived buyer willingness to pay for exceeding Title 24		3.1	
		Extent to which buyers associate EE with quality (1 = not at all, 5 = strongly)		3.6	
		Extent to which buyers associate EE with comfort (1 = not at all, 5 = strongly)		4	
		Importance of RNC program in driving integrated HVAC design		3.7	
		Percent of surveyed builders who say:			
		Buyer demand for EE has grown	8 of 14		
		Buyers expect all homes to be EE	12 of 14		
		Buyers have asked for homes more EE than Title 24	4 of 14		
		On average, percent of incremental cost of EE that builders think buyers are willing to pay	On average, builders think buyers would pay only 10% of the incrememental cost of exceeding Title 24		
		Mean importance, on a 1 to 5 scale, of the following barriers to EE:			
		Lack of buyers willingness to pay		4.2	
		Increased cost of EE homes		4.1	
		Builder performance uncertainty		3.1	
		Not enough EE options		3.1	
		Transaction/hassle cost		3.1	
Architects/Designers	Evaluation of the value of energy efficient design to architects/designer business	Mean rating, on a 1 to 5 scale, of :			
		Perceived buyer demand for EE homes		4	
		Perceived architect influence on designs exceeding T24		2.9	
		Mean importance, on a 1 to 5 scale, of the following barriers to EE:			
		Builder organizational practices		4	
		Increased cost of EE homes		3.6	
		Lack of buyers willingness to pay		3.4	
		Tradeoffs in design caused by EE		3.3	
		Information search cost		3.1	

Exhibit 3-6
Additional Progress Tracking Indicators
Perceptions/Evaluation (Continued)

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Title 24 Consultants	Evaluation of the role of EE features in qualifying for program	Mean rating, on a 1 to 5 scale, of perceived buyer demand for EE homes.		2.9	
		Mean perceived importance, on a 1 to 5 scale, of the following barriers to EE:			
		Increased cost of EE homes		4.5	
		Lack of buyers willingness to pay		4	
		Lack of access to financing		3.6	
		Unavailability of EE suppliers		3.3	
HVAC Contractors	Evaluation of value of EE HVAC installations to contractor business	Percent of surveyed contractors who say:			
		Buyer demand for EE has grown	13 of 15		
		Buyers expect all homes to be EE	13 of 15		
		Mean perceived importance, on a 1 to 5 scale, of the following barriers to EE:			
		Increased cost of EE homes		3.7	
		Organizational practices		3.5	
		Lack of information on interactive effects between HVAC and other home features		3.4	
		Lack of buyers willingness to pay		3.3	
		Contractor performance uncertainty		3.3	
		Concern about design/equipment reliability and callback risk		3.3	
Realtors/Sales Agents	Evaluation of the effect of energy efficiency on home sales	Mean rating, on a 1 to 5 scale, of perceived buyer demand for EE homes.		3.3	
		Percent of surveyed realtors who say:			
		Buyer demand for EE has grown	9 of 15		
		Buyers expect all homes to be EE	12 of 15		
		Buyers have asked for homes more EE than Title 24	5 of 15		
		Mean rating, on a 1 to 5 scale, of:			
		Perceived buyer demand for EE homes		3.3	
		Perceived buyer willingness to pay for EE		2.6	
		Extent to which buyers associate EE with quality (1 = not at all, 5 = strongly)		3.9	
		Extent to which buyers associate EE with comfort (1 = not at all, 5 = strongly)		3.8	
Appraisers	Evaluation of the effect of energy efficient features on home value	Mean rating, on a 1 to 5 scale, of importance of EE in appraisal		2.9	
		Mean importance, on a 1 to 5 scale, of the following barriers to EE:			
		Lack of evidence that buyers value EE		4.5	
		Lack of certified energy rating system		4.2	
		Lack of evidence that lenders value EE		4.2	
		Unavailability of software tool/standard practice		3.4	
		Appraiser performance uncertainty		3.2	
		Information search cost		3.2	
Lenders	Evaluation of marketability of EEMs	Mean rating, on a 1 to 5 scale, of perceived buyer demand for EE homes.		3.9	
		Mean importance, on a 1 to 5 scale, of the following barriers to EE:			
		Loan demand strong enough without offering EEMs		3.8	
		Lack of information from appraisers on the value of EE		3.5	
		Lack of buyer willingness to pay for EE		3.4	
		Transaction/hassle cost of processing EEMs		3.3	
		Transaction/hassle cost of marketing EEMs		3.2	
		Lender performance uncertainty		3.1	
		Lack of certified energy rating system		3	
		Lack of a secondary market for EEMs		3	

Exhibit 3-7
Additional Progress Tracking Indicators
Intentions

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Intentions					
Homebuyers	Intent to purchase program qualifying home	Percent of homebuyers who are very likely (9 or 10 on a 10-point scale) to actively investigate EE features in next home purchase	32%		
		Percent of home buyers who assign high importance (9 or 10 on a 10-point scale) to EnergyStar label for next purchase decision	7%		
Builders	Intent to build and promote program qualifying homes	Percent of builders who say the percentage of their homes exceeding T24 will increase in 2-3 years	8 of 14		
Architects/Designers	Intent to promote energy efficient design to builders/developers	Percent of architects who say the percentage of their homes exceeding T24 will increase in 2-3 years	6 of 15		
Title 24 Consultants	Intent to promote program-qualifying features (above Title 24)	Percent of T24 consultants who say the percentage of homes exceeding T24 will increase in 2-3 years	1 of 15		
HVAC Contractors	Intent to specify/recommend EE HVAC equipment/design	Percent of HVAC contractors who say the percentage of homes exceeding T24 will increase in 2-3 years	8 of 15		
		Likelihood (on a 1 to 5 scale) that contractors will actively investigate and recommend EE features in new homes		4.2	
Realtors/Sales Agents	Intent to actively market program qualifying homes	Percent of realtors who say the percentage of homes exceeding T24 will increase in 2-3 years	9 of 15		
Appraisers	Intent to include energy efficiency premium in home appraisals	On a 1 to 5 (no effect to significant effect) scale, the mean effect on the appraisal process of convincing evidence of an EE premium		2.8	
Lenders	Intent to offer EEMs	Percent of lenders who do not currently offer EEMs but plan to begin doing so.	1 of 13		

3.2.2.2 Builders

Builders perceive relatively little buyer demand for energy-efficient homes (i.e., those that exceed code), though some sense that this demand has increased in recent years due to perceived increases in buyer awareness of energy efficiency benefits.

- Builders also perceive a fairly strong buyer association between energy efficiency and home comfort, and a somewhat less strong buyer association between energy efficiency and home quality.
- However, builders perceive *very* little buyer willingness to pay for desired features; the most important builder-perceived barrier to selling more efficient tract homes is lack of buyer demand and willingness to pay for energy-efficient homes. Exacerbating this split incentives barrier is the fact that builders not only are reluctant to absorb incremental costs, but tend to *under*estimate the costs of exceeding code in a new home.

Overall, builders project increased new home efficiency even in the absence of dramatically increased consumer demand, through the evolution of measure technologies and design practices.

3.2.2.3 Architects/Designers

In contrast to builders, architects perceive fairly high buyer demand for more efficient homes. They also seem to recognize the role that buyers must play in driving the design of more efficient new tract homes, but perceive that barrier as secondary to the barrier posed by builder cost-sensitivity. Architects also expressed some concern about the tradeoffs between energy-efficient tract home features and other aspects of home design.

Architects credited themselves with having at least moderate influence on whether a home or development exceeds code, and appear to have realistic expectations of the cost of exceeding code by 10 percent. Architects were split overall regarding expectations that tract home efficiency will increase in the next few years.

3.2.2.4 Title 24 Consultants

Title 24 consultants also see the primary barriers to more efficient new tract homes (i.e., those that exceed code) being buyer unwillingness to absorb the incremental up-front cost, due to insufficient perceived value in doing so. As a result, most Title 24 consultants expect the proportion of tract homes that exceed code to stay about the same over the next few years.

3.2.2.5 HVAC Contractors

HVAC contractors appear to actively evaluate the value of EE installations to their business. All but two of the 15 HVAC contractors interviewed perceive increased buyer demand for energy efficiency in recent years, with just over half expecting increased HVAC efficiency in tract homes in the coming years. HVAC contractors see incremental cost and builder conservatism and price sensitivity to be the primary barriers to greater HVAC efficiency, along with uncertainty about the information needed to accommodate interactive effects with other home features. Buyer unwillingness to pay (market uncertainty) is also seen as a barrier.

Contractors portray themselves as active proponents of HVAC efficiency, and as the decision-makers regarding system design and duct installation methods. They see Title 24 consultants, however, as the typical decision-maker regarding HVAC equipment and insulation efficiency levels (tied to builder desires to meet, not exceed, code).

3.2.2.6 Realtors

Realtors see moderate buyer demand for energy efficiency, with 60 percent saying this has grown in recent years. On the other hand, realtors gave a lower rating than builders to buyer willingness to pay extra for energy efficiency.

Perhaps because realtors expect buyers to have a fairly high association between energy savings and home quality and comfort, 12 of 15 realtors say most buyers expect all new homes to have energy-saving features. In fact, the low levels of barriers perceived by realtors suggest that they also may believe new tract homes are generally more efficient than they are.

3.2.2.7 Appraisers

Appraisers were found to perceive significant organizational practice and market uncertainty barriers to changes in the appraisal process that would explicitly recognize the value of energy efficiency.

- Appraisers want external validation from utility and government energy efficiency certifications, independent appraisal journals, other appraisers, and trends in actual home sales prices, to feel comfortable making changes in their appraisal processes.
- Appraisers seem willing to build energy efficiency into their appraisal processes and valuations, given evidence and certification that justifies those changes (their criteria for this justification — typically 5-10 homes within a 6-month period sold at a premium because of energy efficiency — were not highly stringent).

3.2.2.8 Lenders

Lenders perceive fairly high consumer demand for energy efficiency in tract homes, but do not consider that demand (or energy efficiency features themselves) very relevant to the task of approving tract home loans. This may be because lenders do not understand the cash flow implications of energy-efficient homes and do not see these cash flow savings being capitalized in the value of efficient tract homes. As a result, lenders generally do not factor energy efficiency into the approval process.

* * * * * *

In summary, most of the supply-side market actors interviewed do not perceive tract homebuyers to be willing to pay for incremental home costs associated with energy-efficient features. The primary barriers perceived by all of the market actors ultimately flow from this central reality, even when some market actors attribute this inflexibility to builders more than to the end consumer.

A possible approach for altering this market dynamic is ensuring that buyer financing is available (when needed), and institutionalizing the capitalized value of energy efficiency in the tract home appraisal process and thereby in prevailing market values. An important secondary factor is the expressed willingness of key supply-side actors (particularly architects and HVAC contractors) to support more energy-efficient tract home design, provided sufficient downstream demand exists.

3.2.3 Market Actor Actions and Sustainability

Findings regarding the extent to which market actors have taken energy efficiency actions and moved toward making those actions sustainable are summarized in Exhibits 3-8 and 3-9 and discussed below. In general, market actors reported behaviors regarding RNC programs and energy efficiency in general that were consistent with their previously outlined levels of knowledge, perceptions, and intentions regarding energy efficiency and the programs.

Exhibit 3-8
Additional Progress Tracking Indicators
Action

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Action					
Homebuyers	Purchase program qualifying home	Percent who participated in utility RNC program	8%		
Builders	Build and promote program qualifying homes	Percent of builders who participated in program	7 of 14		
		Percent of builders who participated in program before PY99	9 of 14		
		Percent of builders who attended utility training or received educational info. In 1999	3 of14		
		Mean rating, where 1 is never and 5 is always, of how regularly builders promote EE.		4	
		Mean rating, where 1 is never and 5 is always, of how regularly builders integrate HVAC/duct outside program.		4.2	
Architects/Designers	Proactively design program-qualifying production homes	Percent of architects who participated in program	2 of 15		
		Percent of architects who attended utility training or received educational info in 1999	1 of 15		
		Mean rating, where 1 is never and 5 is always, of how regularly architects promote EE.		3.6	
Title 24 Consultants	Promote program-qualifying features (above Title 24)	Percent of T24 consultant who participated in RNC program	2 of 15		
		Percent of T24 consultants who attended utility training or received educational info in 1999	5 of 15		
		Mean rating, where 1 is never and 5 is always, of how regularly T24 consultants promote EE.		3.4	
		Mean rating, where 1 is never and 5 is always, of how regularly builders ask for input on exceeding T24.		1.8	
HVAC Contractors	Promote and install EE HVAC equipment/design	Percent of contractors who participated in program	4 of 15		
		Percent of contractors who participated in program before PY99	2 of 15		
		Percent of contractors who attended utility training or received educational info in 1999	3 of 15		
		Mean rating, where 1 is never and 5 is always, of how regularly contractors promote EE.		3.9	
		Mean rating, where 1 is never and 5 is always, of how regularly builders ask for input on exceeding T24.		1.7	
Realtors/Sales Agents	Promote program qualifying homes	Percent of realtors/sales agents who participated in RNC program	4 of 15		
		Percent of realtors/sales agents who attended utility training or received educational info in 1999	0 of 15		
		Mean rating, where 1 is never and 5 is always, of how regularly realtors/sales agents promote EE.		3.9	
Appraisers	Include energy efficiency premium in home appraisals	Percent of appraisers who attended utility training or received educational info in 1999	0 of 15		
Lenders	Offer EEMs	Percent of lenders who offer EEMs	2 of 15		
		Percent of lenders who participated in RNC program	1 of 15		
		Percent of lenders who attended utility training or received educational info in 1999	1 of 15		

Exhibit 3-9
Additional Progress Tracking Indicators
Sustainability

Adoption Stage/Market Actor	Tracking Indicator				
	Necessary Actions	Progress Tracking Indicators	Current Status		
			Percent of Respondents	Mean Ranking	
				(1-5 Scale)	(1-10 Scale)
Sustainability					
Homebuyers	Continue to use energy efficiency as a key criteria in home-related purchase decisions	Participant likelihood (on a 10-point scale, where 1 is definitely would not and 10 is definitely would) of actively investigating EE in next home purchase			8.3
Builders	Proactively build and promote program qualifying homes in the absence of the program	Percent of participating builders who are extremely or very likely to continue program participation	7 of 7		
		Percent of participating builders likely to continue EE practices without program	2 of 7		
Architects/Designers	Proactively design program-qualifying production homes in absence of program	Percent of participating architects likely to continue EE practices without program	2 of 2		
Title 24 Consultants	Promote home features above Title 24 in absence of the program				
HVAC Contractors	EE HVAC a key component of business strategy in absence of the program	Percent of participating contractors who are extremely or very likely to continue program participation	2 of 4		
		Percent of participating contractors likely to continue EE practices without program	2 of 4		
Realtors/Sales Agents	Continue to promote program qualifying homes in absence of the program	Percent of participating realtors/sales agents likely to continue EE practices without program	4 of 4		
Appraisers	Energy efficiency premium standard practice in home appraisals				
Lenders	EEMs offered as part of standard loan process				

3.2.3.1 Homebuyers

Active homebuyer consideration of energy efficiency and RNC program participation remains low, with fewer than 10 percent of surveyed new homebuyers having participated in a program or actively investigated energy efficiency during their new home purchase. Similarly, only 22 percent of homebuyers indicated that any of their contacts or information sources had actively emphasized energy efficiency.

As an indication of sustainability, homebuyer responses do reflect a willingness to more actively consider efficiency in future home purchases.

3.2.3.2 Builders

On average, both program and nonprogram builders say they "sometimes" promote energy efficiency (representing a mean response of 4 on a 1-to-5 scale). All but two of the 14 builders said they always integrate HVAC and duct design. Builders do not appear ready to make a commitment to the ENERGY STAR® brand as standard practice, however; nine of the 14 home builders reported awareness of DOE's ENERGY STAR® Homes Program, none reported having participated in 1999.

Builder responses offered contradictory evidence regarding sustainability. On the one hand, all participating builders said they were extremely or very likely to continue participating in the program as long as it exists; on the other hand, only two participating builders said they were likely to continue their more efficient practices without the program.

3.2.3.3 Architects/Designers

Architects reported somewhat less frequent promotion of energy efficiency than builders, and had limited program participation and utility-sponsored training in 1999.

Ten of the 15 architects reported having designed homes that exceeded code outside the RNC programs. The percentage of 1999 non-program tract home designs completed by these architects that exceeded code ranged from 20% to 100%, with improvements focusing on the core high-efficiency features of HVAC, windows, and insulation.

As another indicator of sustainability, the two architects who designed program homes attributed practice changes to the programs, and said they would continue these practices even in the absence of the programs.

3.2.3.4 Title 24 Consultants

Title 24 consultants report that builders generally are interested in complying with rather than exceeding code, and that they primarily want input on strategies to increase efficiency when a design does not comply. In terms of their energy efficiency knowledge (discussed earlier), attendance at energy efficiency training sessions, and self-reported promotion of designs that exceed code at least some of the time, Title 24 consultants appear to be candidates for supporting energy-efficient homes on a more explicit basis. On one hand, there does not appear to be any obvious self-interest for Title 24 consultants in promoting

higher-efficiency homes more aggressively, nor is there an obvious mechanism for their doing so. On the other hand, these consultants — at least the subset targeted for these interviews who are California Association of Building Energy Consultants (CABEC) certified energy consultants — are likely to place intrinsic value on energy efficiency because they meet these certification criteria.

3.2.3.5 HVAC Contractors

HVAC contractors claimed to consider energy efficiency in tract home recommendations on a fairly regular basis; one-half reported recent changes in how they size, install, or test HVAC systems or ducts in tract homes, with some attribution to utility program and training influences. According to these contractors, however, most tract home HVAC systems remain in the 10 SEER category, while most gas furnaces are in the 80-89% AFUE range.

While builders often ask for HVAC contractor input on how to meet Title 24, they rarely ask for input on how to *exceed* code, as seen elsewhere in this report. Indications are mixed in terms of the sustainability of RNC program effects, considering the likelihood of continued contractor program involvement, practice changes attributed to the programs, and likelihood of practice retention absent the RNC programs.

3.2.3.6 Realtors

The RNC programs appear to have had at least peripheral positive impacts on realtor practices inside and outside the programs, although realtors are not active proponents of energy efficiency.

3.2.3.7 Appraisers

Appraisers appear oriented to actively monitoring the conditions that affect both appraisal values and appraisal procedures, and use well-established software tools and information sources to accomplish this. There is no evidence, however, that these standard tools have been revised to permanently incorporate energy efficiency as an appraisal criterion.

3.2.3.8 Lenders

Lenders have had limited exposure to EEMs, and have received little pressure from borrowers or secondary markets. Only two of the 15 lenders interviewed had offered EEMs, one on a limited basis; a third lender plans to begin offering EEMs soon.

* * * * * *

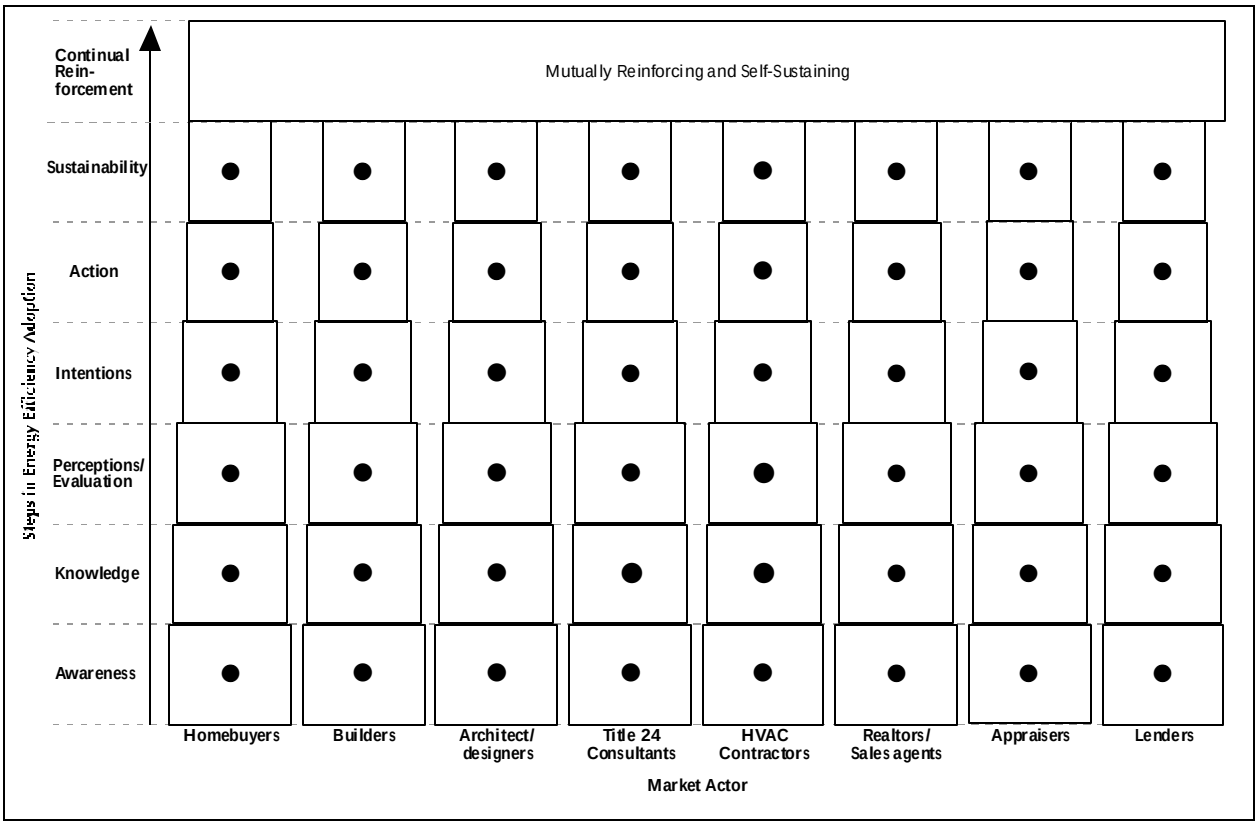
Based on interview responses, supply-side market actors promote energy-efficient home approaches as much as they believe the market will bear, and to the extent that this effort is positive (or at worst, neutral) with respect to their economic well-being. Homebuyers report limited interest in energy efficiency and limited willingness to pay extra for it, and the upstream value chain responds to this lack of a market signal and limits its emphasis on energy efficiency. RNC supply-side market actors generally characterize themselves as willing and able to promote and deliver energy efficiency, provided homebuyers (and in some cases, builders) are willing to pay for these measures.

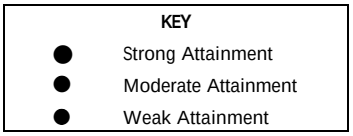
3.2.4 Integrated Results

A visual summary of the findings discussed in this chapter is presented in Exhibit 3-10. These results highlight the importance of homebuyer preference and willingness to pay for energy efficiency as necessary conditions to further market effects that have not yet been achieved. This is particularly true for homebuyers themselves, where success in influencing consumer intentions needs to be followed up with ongoing program efforts to address the critical awareness and knowledge stages in the adoption process. Similar information-related barriers will also have to be overcome for realtors / sales agents, appraisers, and lenders if these crucial market actors are to ultimately make EEMs and capitalization of energy savings an integral part of their standard business practices.

Exhibit 3-10 and the detailed information presented in this chapter that supports it serve as the basis for the RNC program recommendations provided in Chapter 4.

Exhibit 3-10
Overview of RNC Energy Efficiency Adoption Status





4. RECOMMENDATIONS

Key findings of the RNC market and program characterization support the recommendations for improved future program effectiveness presented in this chapter. Both the design of programs to accelerate the evolution of an efficiency-oriented RNC market and the development of market effects indicators to track program success are discussed.

4.1 PROGRAM DESIGN AND INTEGRATION

Overall, the study data suggest that PG&E and its Comfort Home program are the most visible (in terms of program awareness, training session awareness and attendance), SoCalGas and its EAH program also are relatively visible, and the SCE and SDG&E ComfortWise programs appear less familiar to their markets. This is not surprising given the longevity of the former programs, and the scale of activity of the EAH program in particular. What this finding underscores is the importance of visible, consistent, appropriately branded sponsor commitment *over time* in helping to transform the RNC market.

Going forward, this kind of sustained commitment could possibly be applied on a state-wide, cross-utility basis to ensure optimum use of all promotional and other resources. The tract-home new construction market does not conform to utility service territory boundaries; the specific utility that will serve a home is not a significant concern in the purchase or business decisions of buyers, builders, contractors, and most other supply-side market actors. A number of market actors were unable to name utility RNC programs even though they knew such programs existed; some cited the names of programs outside their territory.

On that basis, the integration of individual utility programs should be considered. While market actors generally are unfamiliar with the elements of an ENERGY STAR® home, and how these homes differ from "standard" RNC program homes, the ENERGY STAR® brand (or some California-specific brand) may have the potential to serve as a unifying platform for RNC market transformation.

- The ENERGY STAR® brand continues to be the subject of an ongoing, increasingly broad national information, promotion, and marketing campaign that is attached not just to homes but to a wide range of electronics, appliances, and other household products. This effort will eventually result in ENERGY STAR becoming synonymous with energy efficiency, so that new homes carrying the ENERGY STAR label would be instantly perceived as energy efficient.

- Overall awareness of the ENERGY STAR® brand can be expected to continue to grow; moreover, this awareness is likely to extend beyond current homeowners or consumers already in the market for a new home to those who will become first-time home buyers in the future, thereby helping to build a base of brand awareness that could serve as a valuable leverage point for promoting RNC energy efficiency.

Because it is a national program, ENERGY STAR® has the potential for a tie-in with other strategies that benefit from a nationwide approach, including home energy rating systems

(HERS) and energy efficient mortgages, which can be approved and promoted by national secondary lending institutions such as FHA, FNMA, and HUD.

A potential disadvantage of reliance on ENERGY STAR® could be the perception among some market actors that ENERGY STAR® may be national, and not relevant to the California market. We would therefore recommend a California-wide implementation of ENERGY STAR® that goes beyond the national standard but still leverages the national brand. It might be appropriate, for example, to market high efficiency homes under an ENERGY STAR® Plus or CalStar brand, with uniform standards across the state.

In addition to a more integrated approach, the following recommendations are offered regarding program design:

- Efforts should be made to ensure that buyer financing is available (when needed), and to institutionalize the capitalized value of energy efficiency in the tract home appraisal process (and thereby in prevailing market values).
- Future RNC programs should address high-importance demand barriers for all market actors, with the goal of making homebuyers as aware and knowledgeable regarding energy efficiency as builders, architects, and HVAC contractors. Interventions might reasonably include both advertising (to make all market players more knowledgeable) and rebates (to stimulate both supply and demand.)
- A large-scale segmentation study of recent and/or imminent homebuyers should be considered. Based on consumer behavior in many other categories, chances are high that the overall homebuyer profile masks differences between market segments. Interventions in the RNC market may be more effective if targeted to segments with the greatest interest in and willingness to pay for the benefits of energy efficiency.
- Buyer demand appears to be the key to RNC market transformation, and in turn this may depend on buyer ability to capitalize the value of energy efficiency and see that value reflected in their mortgage. In addition to development and promotion of a unified approach to energy efficient mortgages (EEMs) across the state, it is recommended that one or more of the California utilities consider supporting a third-party pilot initiative to quantify the value of energy efficiency, even on a modest scale. Assuming a successful pilot, a follow-on initiative could then be considered to develop a software tool that incorporates energy efficiency data into appraisals, possibly in cooperation with ENERGY STAR, FNMA, or HUD.
- As described earlier, architects and HVAC contractors have similar profiles on important dimensions of energy efficiency adoption. Program planners should explore ways that these two knowledgeable market actor groups can be allied to reinforce each other's positive influence on tract home efficiency.
- Emphasis should continue to be placed on targeting consumer "event segments" — that is, consumers who are shopping for a new home in the near term — and persuading them to identify themselves and receive correspondence from energy efficiency sponsors during their shopping process. With a growing percentage of home buyers using the internet in their home selection and purchase process, web-based information and response mechanisms could be a key part of such an approach.

In conclusion, while challenges remain in transforming the RNC market, it appears that a unified state-wide approach incorporating the kinds of segmentation, targeting, and proof-of-concept strategies outlined above can help make future RNC market interventions as effective and efficient as possible, while leveraging the valuable program platforms that exist today.

4.2 MARKET EFFECTS INDICATORS

In addition to the market effects indicators described in Chapter 2, several additional indicators are recommended that would provide a richer, more detailed assessment of the extent to which RNC programs are transforming their target market. As illustrated throughout Chapter 3, additional tracking indicators are recommended for a number of the existing program elements that have goals associated with them; other indicators are linked to the increased emphasis on ENERGY STAR® that would result from a unified approach to the RNC market. Examples of additional indicators related to current utility-filed indicators are provided below.

Additional indicators related to the ENERGY STAR® program include increased builder knowledge of ENERGY STAR® efficiency criteria a given number of months after training, as well as observed and self-reported builder changes in new home design and construction practices attributed to ENERGY STAR®. Builders can also be asked to assess the evolving value of the ENERGY STAR® brand in marketing.

In addition, several indicators are proposed to determine whether the goals filed as program milestones are in fact achieving the desired effects in the market. For example:

- The number of Builder Resource Guides distributed should be followed up with data on the frequency and value of BRG use as reported by builders.

- The number of training sessions held for window / duct contractors or sales agents should be followed up with an assessment of the increased knowledge of energy efficiency reported by the attendees and attributed to the training.

- The number of publications mailed, calls received / made, and advertising pages placed all help measure the extent of program activity; these measures should be followed up by an assessment of increased home buyer knowledge of the content of the information materials distributed, including correcting popular misconceptions such as the belief that all new homes are energy efficient.

Ultimately, the purpose of these and other market effects indicators should be determine whether fundamental changes are taking place in the way market actors perceive and act upon issues of energy efficiency in the RNC market. As such, the goal is to combine measures of program activity with corresponding indicators of program effects to determine if it is possible to establish a direct causal link between program elements and permanent, sustainable changes in the market. This is achieved by evaluating indicators in the context of the adoption model, so that multiple steps can be analyzed to gauge overall market effects and / or transformation.

A. RNC MARKET TRANSFORMATION EFFECTS AND PROGRESS INDICATORS

A. SUPPORTING MARKET ACTOR ASSESSMENT

Supporting data on the progression of each market actor group through the stages of the product development process are presented in this appendix. Consistent with the main report, homebuyers are discussed first. The four market actor groups directly involved in new home construction — builders, architects / engineers, Title 24 consultants and HVAC contractors — are then discussed. Supporting market actor groups — realtors / sales agents, appraisers and lenders — are then assessed.

A.1 HOMEBUYERS

A.1.1 Homebuyer Awareness/Knowledge

While homebuyers have a surface awareness of the RNC programs and surface knowledge of energy-efficiency criteria, their awareness and knowledge generally has little depth. Among the RNC programs, the Comfort Home program has the highest level of awareness, both at the time of home purchase as well as at the time of the survey, while ComfortWise has the lowest (see the first panel of Exhibit A-1).

Regarding homebuyer awareness of energy efficient home features (summarized in the third panel of Exhibit A-1):

- Program participants generally mentioned the more common measures at least slightly more often than did nonparticipants; the most significant difference is seen regarding insulation. While this pattern of differences cannot prove market or even program effects (because self-selection may have caused more knowledgeable homebuyers to search out and participate in the RNC program), it is certainly consistent with a hypothesis that homebuyers become sensitized to energy-efficient new home features by buying a program home. This pattern should be viewed with caution due to the small base (18) of self-reported program homebuyers.
- Homebuyers in the SoCalGas customer base were particularly likely to mention the furnace / heating system and window / door insulation as efficiency drivers.
- PG&E homebuyers were particularly likely to mention non-specific (general) insulation as a contributor to home efficiency.
- Homebuyers in the PG&E and SCE customer bases were more likely than those in the SoCalGas and SDG&E customer bases to mention windows as a contributor to home efficiency.
- SCE homebuyers were particularly likely to mention water heaters and heating fuel choice as efficiency drivers.
- Homebuyers with air conditioning were slightly more likely than those without air conditioning to mention air conditioning, appliances, roof / ceiling insulation, and windows, as contributors to home efficiency.

Exhibit A-1
Homebuyer Awareness and Knowledge

Program Awareness

Program/Feature	**Percentage of Homebuyers Aware**
Unaided Responses	
RNC Programs by Brand Name	3
RNC programs either by brand name or in association with the sponsoring utilities	19
ENERGY STAR® Homes Program	1
Aided Responses	
PG&E's Comfort Home	21
SCE/SDG&E ComfortWise	3
SoCalGas Energy Advantage Homes	11
ENERGY STAR® Homes	18

When Respondents Became Aware of Programs

When Respondents Became Aware	**Percentage of Respondents**
Respondents Aware of Comfort Home at the Time They Bought Their Current Home (during 1999)	58
Respondents Aware of the Comfortwise at the Time of Purchase	14
Respondents Aware of the Energy Advantage Homes at the Time of Purchase	44
Respondents Aware of the ENERGY STAR® Homes Program at the Time of Purchase	59

Homebuyer Awareness of Energy Efficient Home Features

Home Feature	**Percentage of Respondents Aware**
Windows	44
Non-Specific Insulation	27
Appliances	23
Air Conditioners	22
Roof/Ceiling Insulation	20

- Homebuyers with homes valued at $300,000 or more were more likely than those with less expensive homes to mention heating fuel choice, window/door insulation, water heaters, and windows, as contributors to home efficiency. Conversely, those with more expensive homes were less likely to mention non-specific (general) insulation.
- Homebuyers who reported buying tract homes were less likely than those who reported some other home type (i.e., custom) to mention heating fuel choice, window/door insulation, and water heaters as contributors to home efficiency. Conversely, tract homebuyers were more likely to mention appliances.

One-quarter (25%) of the respondents say that some new homes are more efficient than others, and one-half (54%) say that most new homes could be made more efficient than they are. When asked how new homes can be made more efficient, homebuyers most often mentioned non-specific insulation (17%), windows (12%), and roof/ceiling insulation (12%). Differences by key market segments (questions AW030 and AW031 in Exhibit A-2), and are summarized below:

- SCE homebuyers were less aware than other homebuyers that new home efficiency varies.
- SoCalGas homebuyers were more aware than other homebuyers that new homes could be made more efficient.
- Buyers of homes valued at $300,000 or more were less aware that new home efficiency varies, and that new homes could be made more efficient, relative to buyers of less expensive homes.
- Tract homebuyers were more aware than other homebuyers that new home efficiency varies.

For a series of key home measures, respondents were asked how they would identify energy-efficient versions of those measures. They included windows, wall insulation, roof/ceiling insulation, gas furnaces, gas water heaters, and electric water heaters. Homebuyer responses were a mix of valid efficiency criteria (e.g., "high SEER" or "12+ SEER"), more ambiguous efficiency criteria (as when a homebuyer mentioned an out-of-normal-range SEER value), and comments unrelated to efficiency criteria (e.g., "read/looked for product labels").

- Except for windows, homebuyers generally were unable to provide specific, valid efficiency criteria (based on a list of criteria for each measure).
- Nearly one-half (46%) of homebuyers provided a valid efficiency criterion for windows; the predominant response was double- or triple-paned windows (40%). It should be noted that this criterion may reflect an easier response than a specific U-value, HVAC SEER value, or insulation R-value.
- However, the percentages of homebuyers providing valid efficiency criteria for the other measures was much smaller: 8% each for roof/ceiling insulation and wall insulation, 4% for HVAC, 3% for gas water heaters, 2% for gas furnaces, and none for electric water heaters.

Exhibit A-2
Summary of Selected Homebuyer Survey Results by Key Market Segments

	RNC Program Particpatior			Service Territory				Proxy for Climate Zone		Home Value ($000)			Housetype	
	Total (n=226)	Participants (n=18)	Non-Participants (n=208)	PGE (n=75)	SCE (n=40)	SCG (n=35)	SDG&E (n=76)	Have AC (n=176)	No AC (n=50)	< 200 (n= 72)	200-300 (n=80)	> 300 (n=70)	Tract Home (n=185)	Other (n=32)
RN014 - How Important is Energy Efficiency, on a scale of 1 to 10. (Mean)	6.8	8.3	6.6	7.3	6.6	7.6	5.9	6.8	6.6	7.4	6.6	6.3	6.6	7.4
RN015 - Percentage of respondents who have heard of energy-effiency programs	41	65	39	51	36	37	34	41	38	44	40	39	42	42
RN017 -Percentage of respondents who have heard of the following programs (prompted - if not mentioned above)														
Comfort Home	20	73	16	41	8	12	9	20	18	29	14	14	21	10
ComfortWise	3	6	3	3	8	9	3	3	4	4	5	6	3	10
Energy Advantage Program	11	11	11	14	11	21	6	10	14	19	8	16	11	16
Energy Star Homes Program	18	18	18	19	18	21	19	18	17	20	17	20	18	16
RN022 - How Actively respondent investigated energy efficiency at time of home shopping on a scale of 1 to 10. (Mean)	6.8	8.3	6.6	7.3	6.6	7.6	5.9	6.8	6.6	7.4	6.6	6.3	6.6	7.4
RN024 - Percentage of respondents who reported information sources or contacts who actively emphasized energy efficiency.	22.0	33.3	21.0	27.4	27.5	20.0	19.7	21.8	22.4	25.7	21.5	22.9	22.4	21.9
AW029 - Percentage of respondents recognizing the following features as contributing to energy efficiency.														
Air Conditioner	22	28	21	20	18	26	18	23	16	25	16	26	22	22
Appliances	23	22	23	28	10	20	21	24	16	21	20	17	23	13
Furnace/Heating System	12	17	12	7	10	23	13	12	12	10	10	11	10	6
Heating Fuel Choice	12	17	12	11	23	9	16	12	12	13	13	26	14	31
Roof/Ceiling Insulation	19	33	18	21	13	20	16	21	14	19	14	17	18	13
Window/Door Insulation	12	22	11	8	15	23	11	12	12	13	8	29	12	31
General Insulation	27	56	25	41	10	23	22	27	28	28	26	11	26	19
Water Heater	10	17	10	9	48	9	12	10	12	10	9	46	8	50
Windows	44	56	43	52	63	34	39	47	34	44	41	70	44	48
AW030 - Percentage of respondents who reported that some new homes are more energy efficient than others.	70	71	70	60	39	80	81	69	74	57	82	26	75	36
AW031 - Percentage of respondents who reported that new homes could be more energy efficient.	34	44	34	35	24	52	23	35	34	42	36	23	34	26
Percentage of respondents who reported that the following measures have substantially different effiency levels														
AW035 - Gas furnaces	41	50	41	43	48	47	46	39	47	35	59	39	46	25
AW037 - Gas water heaters	52	67	51	51	8	59	53	53	51	53	64	0	56	6
AW043 - Windows	14	11	14	17	0	23	11	13	16	18	21	0	16	0
PE047 - Likelihood of actively investigating energy efficiency during the next home purchase on a scale of 1 to 10. (Mean)	6.8	8.3	6.6	7.3	6.6	7.6	5.9	6.8	6.6	7.4	6.6	6.3	6.6	7.4
PE049 - Agreement with the following statements on a scale of 1 to 10. (Mean)														
Energy-efficient features in a new home cost more than they're worth	4.3	5.5	4.2	5.0	4.1	4.7	3.6	4.3	4.5	4.5	4.3	4.3	4.1	5.9
It takes too much time and hassle to find information about energy efficiency when I'm buying a home	7.0	8.1	6.9	7.2	7.6	6.9	6.6	7.1	6.6	7.2	7.1	6.7	7.0	7.3
I have a hard time believing energy efficiency information provided by new home builders	3.6	4.4	3.5	3.7	3.1	4.7	3.3	3.6	3.5	4.0	3.3	3.6	3.5	3.7
To interest me in energy-efficient features, the cost would have to be rolled into the mortgage	4.5	3.4	4.6	4.0	4.4	4.9	4.9	4.5	4.4	4.5	4.1	4.8	4.6	3.3
I am willing to invest in home features that will reduce my monthly costs	5.7	7.3	5.6	6.1	5.6	5.3	5.5	5.6	6.0	6.2	5.8	5.0	5.9	4.7
I will ONLY invest in those features that will affect the appearance and potential resale value of this home	4.2	4.2	4.2	4.1	3.9	5.1	4.0	4.0	4.9	4.4	4.1	4.1	4.2	4.2

Exhibit A-2 Continued
Summary of Selected Homebuyer Survey Results by Key Market Segments

		RNC Program Participation		Service Territory				Proxy for Climate Zone		Home Value ($000)			Housetype	
	Total (n=226)	Participants (n = 18)	Non-Participants (n = 208)	PGE (n= 75)	SCE (n= 40)	SCG (n= 35)	SDG&E (n= 76)	Have AC (n= 176)	No AC (n= 50)	< 200 (n= 72)	200-300 (n = 80)	> 300 (n= 70)	Tract Home (n = 185)	Other (n= 32)
First Home (%)	27	44	25	24	15	44	28	23	38	42	29	10	29	16
Owned Other Homes (%)	73	56	75	76	85	56	72	77	62	58	71	90	71	84
Income Category														
Uner $20,000	2	.	2	3	3	.	.	1	5	3	.	2	1	7
$20K - $30K	5	6	4	8	5	3	2	4	7	12	2	.	4	4
$30K - $50K	14	24	13	10	14	33	8	13	16	26	11	3	14	4
$50K - $75K	24	18	25	21	32	24	23	24	27	34	31	8	25	25
$75K-$100K	24	29	23	31	24	12	23	26	16	15	35	22	24	29
$100K or more	32	24	33	27	22	27	45	33	30	10	22	66	32	32
Age Categories														
Under 30	14	6	15	11	13	29	11	14	12	24	8	11	14	13
30 to 39	36	53	35	33	33	34	43	36	36	31	46	31	37	34
40 to 49	22	24	22	19	23	23	25	19	34	15	27	26	22	22
50 to 59	13	6	14	15	23	9	9	15	8	13	9	20	14	13
60 to 69	9	6	10	12	8	6	9	10	8	11	8	7	8	19
70 or older	4	6	4	10	3	.	3	5	2	6	4	4	5	.
Level of Education														
Some High School or less	0	.	.	0	.	.	.	.	.	.	.	.	0	.
High School Graduate	9	18	8	12	13	15	1	10	6	17	4	7	6	22
Some College	27	12	29	27	30	35	22	28	26	39	31	11	28	19
Technical or Associate's Degree	12	18	11	11	13	15	11	13	8	11	13	11	12	6
Four-year college Degree	30	29	30	26	25	18	43	29	36	14	35	41	31	28
Post-Graduate or Professional Degree	22	24	22	24	20	18	22	21	24	18	18	29	22	25
Mean Number of People in Household	3.77	3.94	3.75	3.56	3.73	3.97	3.89	3.78	3.72	3.41	3.70	4.20	3.79	3.72
Female	51	56	51	53	50	51	50	51	52	54	55	43	53	44
Male	49	44	49	47	50	49	50	49	48	46	45	57	47	56

Selected differences were noted among market segments (see AW035, AW037, and AW043 in Exhibit A-2):

- SCE new homebuyers were less aware than other homebuyers that gas water heater and window efficiency levels can vary.
- Homebuyers with homes valued at $300,000 or more were less aware than those with less expensive homes that gas furnace, gas water heater, and window efficiency levels can vary.
- Tract homebuyers were more aware then other homebuyers that gas furnace, gas water heater, and window efficiency levels can vary.

A.1.2 Homebuyer Perceptions/Evaluations and Intent

New homebuyers place modest but not significant importance on energy efficiency in their home purchases, and on the RNC programs in impacting their selection of specific homes. They also express some broad (but not sharp) distinctions between different subjective market barriers. Homebuyers' greatest barriers included one (access to financing) that lenders say can be met through existing vehicles as well as through energy-efficient mortgages (EEMS) as currently structured, and one that appears more intractable (buyer desire to invest only in energy efficiency features whose value will be capitalized in the home's market value).

Homebuyers assigned a modest level of importance to energy efficiency when purchasing their current home (during 1999), with 27% providing a 9 or 10 rating on a 10-point scale

rating the importance of energy efficiency to them. Several differences were noted by key market segments (see RN014 in Exhibit A-2), as follows:

- Program participants provided a higher mean rating for energy efficiency than did nonparticipants, though this finding should be viewed with caution both because of the small base (18) of self-reported program homebuyers, and also because of the possibility of participant self-selection.
- SoCalGas homebuyers rated energy efficiency highest in importance, while SDG&E homebuyers rated it lowest in importance (based on mean ratings).
- As might be expected, the mean importance of energy efficiency to homebuyers decreased as home value increased, indicating decreased cost-sensitivity with (in all likelihood) increased disposable income.
- Tract homebuyers reported a lower mean importance rating than did "other" homebuyers.

Five of the 18 homebuyers who reported buying program homes (28%) assigned high importance to the program sponsorship in their purchase selection. In part because only one-fifth (18%) of homebuyers recognized the ENERGY STAR® Home Program as one that encourages efficient home construction, only 7% of homebuyers in total assign high importance in their next home purchase decision to an ENERGY STAR® Homes Program label on efficient new homes.

Homebuyers rated six agree/disagree subjective market barrier statements. Exhibit A-3 shows mean ratings and bottom-2-box ratings for each barrier; the higher the rating, the greater the barrier is perceived to be.[1] Based on these data, access to financing and unwillingness to invest in energy efficiency that does not increase resale value are the strongest subjective homebuyer barriers. Conversely, the least pervasive subjective homebuyer barriers were perceived low value and unwillingness to invest in money-saving measures.

Exhibit A-3
Summary of Homebuyers' Subjective Market Barrier Ratings

Subjective Market Barriers	***Mean Rating (higher = worse)***	***Bottom-2-Box Rating (higher = better)***
Access to financing	5.70	23
"Will only invest if affects resale" (relates to market uncertainty)	5.48	23
Information/search cost	4.49	31
Asymmetric information	4.21	36
Low value/cost	3.60	40%
"Will invest if saves money" (relates to	3.54*	46*

[1] Bottom-2-box ratings — the percentage providing a 1 or 2 rating — were used because the bottom-2-box rating reflected greater distinctions across barriers than did top-2-box ratings.

bounded rationality)*		

* Transposed mean and top-2-box rating were used for "will invest if saves money," as agreement denotes a lower market barrier.

Differences (at least directional in nature) were noted across key segments, and suggest the possibility of refining RNC programs by targeting them to certain market segments (although research with larger sample sizes would increase confidence in this regard). These differences were as follows:

- The (small sample of) program buyers rated low value/cost and access to financing as greater barriers, and information/search cost and "will only invest if it affects resale" as lesser barriers, compared to non-program homebuyers.
- SoCalGas homebuyers rated low value/cost and asymmetric information as greater barriers than did other homebuyers. SoCalGas and SCE homebuyers rated "will only invest if it affects resale" as a greater barrier than did PG&E and SDG&E homebuyers. PG&E homebuyers rated information/search cost lower and access to financing higher as barriers relative to other buyers.
- Homebuyers with air conditioning (i.e., those more likely inland) rated "will only invest if it affects resale" as a greater barrier, and asymmetric information as a lesser barrier, relative to homebuyers without air conditioning.
- As might be expected, homebuyers with homes valued at $300,000 or more saw access to financing as less of a barrier than did buyers of less expensive homes.
- Tract homebuyers rated information/search cost, access to financing, and (un)willingness to invest in features that save money as greater barriers than did buyers of other homes (i.e., buyers of custom, probably more expensive, homes).

The primary measure of homebuyer *intentions* was a question in which they rated their likelihood of actively investigating energy-using characteristics of homes in the future. On that basis, one-third (32%) of homebuyers said they were likely to do so, similar to the 27% who rated energy efficiency important when buying their current home, as reported earlier in this section. The mean rating on this 10-point scale was a 7.0, and on that mean ratings basis, several segment differences were noted, as follows.

- Despite higher barrier ratings (as noted earlier), program participants appear more likely to actively investigate energy efficiency in their next home purchase than are non-program buyers. Because of the small program buyer base size (18), this difference should be viewed with caution, and as indicative but not conclusive.
- SCE homebuyers reported particularly high likelihood of investigating energy efficiency in future home purchases, while SDG&E homebuyers reported relatively low likelihood.
- Homebuyers with air conditioning were more likely than those without air conditioning to actively investigate energy efficiency in their next home purchase.
- Likelihood of actively investigating energy efficiency declined as home value increased, probably a reflection of less cost-sensitivity with greater affluence and disposable income.

A.1.3 Homebuyer Actions and Sustainability

Active consideration of energy efficiency and RNC program participation remain low. However, the preceding discussion on basic homebuyer knowledge of energy-efficient measures, and perceptions regarding energy efficiency, reflects a willingness to more actively consider and more often purchase efficient new homes in the future.

In total, 18 of the 226 homebuyers surveyed (8%) reported buying RNC program homes in 1999.[2] Of the 18 program homebuyers, 15 were PG&E Comfort Home participants and three were SoCalGas Energy Advantage Home participants.

Consistent with the above, only 9% of homebuyers said they actively investigated the energy efficiency of their current home. Recall that 27% reported (in a more general way) that energy efficiency was important in selecting their new home.

Only one-fifth (22%) of homebuyers indicated that any contacts or information sources had actively emphasized energy efficiency. The builder or development sales agent was mentioned by 15% of all homebuyers, and by two-thirds of those who reported that some party had actively emphasized energy efficiency to them. However, no contacts or information sources, whether consulted by the homebuyer or actively emphasizing energy efficiency to the homebuyer, significantly increased their consideration of energy efficiency when shopping for their current homes.

[2] While homebuyers were surveyed randomly from utility-provided databases of new homebuyers in 1999, there was no way that program homebuyers could be identified in these databases because that information is known to builders but not to the utilities.

A.2 BUILDERS

A.2.1 Builder Awareness/Knowledge

Builders' surface knowledge of the measures that can impact energy efficiency was relatively high, although their playback of specific energy efficiency and RNC program participation criteria was low. Program and EEM awareness appears higher in PG&E service territory than elsewhere, although this does not appear to translate into greater knowledge of energy efficiency or program participation criteria, or use or applicability of EEMs (from the builder perspective).[3] A summary of EEM awareness and knowledge is presented in Exhibit A-4.

Exhibit A-4
Awareness of Energy Efficient Mortgages

Awareness	**Number of Builders (n=14)**
Awareness of EEMs as Described to Them in the Survey	7
Builders Who Are Aware of EEMs, and Say They Are Available in Their Area	3
Builders Who Say EEMs Are Available in Their Area, and perceived that EEMs had been used by 1999 homebuyers	1
Builders Who Say EEMs Are Available in Their Area, and said EEMs had not been used by 1999 Homebuyers	1
Builders Who Say EEMs Are Available in Their Area, and Were Unsure of Whether They Had Been Used by 1999 Homebuyers	1
Builders Who Are Aware of EEMs, and Say They Are Unsure about Whether They Are Available in Their Area	4

Builders reflected a relatively high degree of knowledge regarding energy efficiency criteria (as would be expected given that half of the 14 builders surveyed were RNC program participants). On average, builders reported 2.5 valid energy efficiency criteria on a survey checklist of these criteria. The most common mentions were windows (8), non-specific insulation (7), and HVAC (6), generally in line with current and recent RNC program emphasis. Other mentions included attic/whole-house fans, furnace/heating system, and multiple zones, each mentioned by two builders.

[3] In reviewing builder awareness and knowledge of RNC program features and energy efficiency criteria, recall that the sample of builders surveyed was somewhat skewed toward PG&E service territory. This was due to a combination of factors, including the distribution of large production (tract) builders across California, and the availability of program builders for this study.

Another important element of builder knowledge is their familiarity with RNC program participation requirements for builders. PG&E program builders were somewhat vague in their responses, with two not able to give any specifics, while a third mentioned high-SEER HVAC and insulated ducts, and the fourth mentioned windows, insulation, and HVAC. One SCE program builder mentioned appliances, while the other mentioned low e-squared glass, increased insulation, and HVAC installation subject to inspection. The SoCalGas program builder mentioned use of high-efficiency specs for appliances, HVAC, and toilets.

None of the program builders mentioned specific measure efficiency criteria or thresholds, nor did the non-program builders reported knowledge of builder participation criteria. More detailed information on non-program builder knowledge of RNC-related programs is presented in Exhibit A-5.

Exhibit A-5
Non-Program Builder Knowledge and Awareness

Program	**Number of Builders (n=15)**
Unaided Responses	
ComfortWise	1
Energy Advantage Home	1
ENERGY STAR® Homes Program	3
SMUD RNC programs	2
"5-Star" program	2
SCE refrigerator program	1
"Energy for Life" attic insulation program	1
Aided Responses	
PG&E's Comfort Home	4
SCE/SDG&E ComfortWise	3
ENERGY STAR® Homes	7

A.2.2 Builder Perceptions/Evaluation and Intent

Builders perceive relatively little buyer demand for energy-efficient homes (those that exceed code), though some sense that this demand has increased in recent years.

- This increase is attributed more to increased consumer awareness of energy efficiency benefits than to increased buyer value attributed to energy efficiency.
- The most important builder barriers to building and selling a greater proportion of homes that exceed code are demand-side factors — lack of buyer demand and

willingness to pay for energy-efficient homes,[4] and the perceived need for increased consumer demand stimulation through utility programs. While other barriers are constraining factors at some level, and other market actors offer possible support for increased efficiency, consumer demand is paramount.

Additional summary points include:

- Builders perceive a fairly strong buyer association between energy efficiency and home comfort, and a somewhat less strong buyer association between energy efficiency and home quality.
- Program builders give more credit to the program for influencing their approach to HVAC design than to influencing their willingness to design and build non-program homes to exceed code.
- Builders tend to feel that new home efficiency will increase even in the absence of dramatically increased consumer demand, through the evolution of measure technologies and design practices.

With this overview, the remainder of this subsection begins by reviewing builder perceptions regarding homebuyer knowledge, priorities, motivations, and actions relating to energy efficiency and homebuying. It then discusses builder perceptions regarding other factors affecting new construction energy efficiency. This discussion is followed by an assessment of builders' subjective market barriers, then by an assessment of builder's perceptions regarding the influence of different market actors on new home energy efficiency.

Builders were asked to rate the level of buyer demand for energy saving features on a scale that (for benchmarking purposes) read "a lot," "some," "little," "very little," and "none." Responses have been converted to a 5-point scale for ease of summary, with 5 = a lot, etc. On that basis, builders reported a mean rating of 3.5, centered between "little" and "some." The energy saving features that homebuyers most often request from builders were non-specific insulation (8), non-specific windows (7), HVAC (4), fans (3), furnace / heating system (3), and water heaters (3).

In a separate but related question, 8 of the 14 builders perceived increased homebuyer demand for energy-saving features over the past 5 years. In a follow-up question probing the reasons behind perceived increases, builders tended to credit increased buyer awareness of energy savings potential (as distinct from an increase in value attached to energy savings) as a key factor. Builders who perceived no change or a decrease in interest in energy savings mentioned the robust economy and strong incomes as a key constraint to energy efficiency adoption.

Builders were asked to rate buyer willingness to pay additional costs for the measures that they associate with energy savings. The scale used was extremely willing (5), very willing (4),

[4] While some builders do see some buyer willingness to pay in the abstract, responses to real-world scenarios indicated that builders don't expect buyers to be willing to pay a very large dollar amount for energy-saving measures. Likewise, builders tend to underestimate the costs of exceeding code by 10% in new tract homes.

somewhat willing (3), not very willing (2), and not at all willing (1). On that basis, builders reported a mean rating of 2.9, centered on the "somewhat willing" level. On a separate but related question, all but two of the builders said that homebuyers expect all newer homes (those built in the last five years) to be energy-efficient.

Builders rated buyer willingness to pay for homes that exceed Title 24, and also provided estimated extra costs for exceeding Title 24 by 10%, and the percentage of that amount that homebuyers would be willing to pay. Buyer willingness to pay was rated on a scale of a lot (5), some (4), little (3), very little (2), or none (1), and on that basis the mean rating was 3.1, centered around the "little" rating. When builders were asked how much extra it would cost to exceed Title 24 by 10%, a cluster of responses emerged in the $200 to $500 range, while two builders said zero ("it's built into the current home design"), one said 10%, and one said $7,000 or less. When asked what proportion of this amount buyers would be willing to pay, responses tended to center around the small 5-10% range, with several builders saying zero, one saying 25%, and the respondent reporting extra costs of $7,000 or under saying 2-3%. Builders clearly perceive little homebuyer willingness to spend significant sums of money to pay for up-front costs of increased efficiency.

In a related question, only three of the seven program builders said they built homes that exceed Title 24 in 1999 outside the program. Of those three:

- One SCE program builder said the program was very important in their decision to build non-program homes that exceed Title 24, that 40% of non-program homes exceeded Title 24, and that windows, insulation, and home orientation are key factors in exceeding Title 24.
- One PG&E program builder said the program was not at all important, said all five of his non-program homes exceeded Title 24, and reported that overall design, energy calculations, higher AFUE furnace, higher SEER HVAC, and insulation are key factors in exceeding Title 24.
- Another PG&E program builder said the program was very important, that 30% of non-program homes exceeded Title 24, and that the HVAC contractor was influential in accomplishing this.

Program builders who do not build non-program homes to exceed Title 24 indicated this was because of higher home cost, a desire to meet but not exceed code, lack of utility education and enrollment of builders, and, in the case of one builder, that they "don't build non-program homes."

In a related question, builders were asked if homebuyers had ever specifically asked about homes that exceed Title 24. Four of 10 respondents reported buyer inquiries about homes exceeding Title 24; one SCE ComfortWise builder said that 40% had done so in the last year, and one SoCalGas EAH builder said that 3-5% had done so in the last year. In addition, two PG&E non-program builders reported buyer inquiries of this type (one said 3-5% of buyers in the last year, while the other said 30-40%).

Program builders were asked to rate how important the RNC program was in influencing them to pursue integrated HVAC system design. Four of the seven (including three of the four PG&E builders) provided a 5 rating on the 5-point scale provided; other responses were

a 2, a 3, and a 1. The mean was 3.7, suggesting that the programs have had more impact in supporting this important design element than in generating broader builder interest in exceeding Title 24 without program support.

Builders were asked to rate the degree of association they believe that homebuyers make between (1) energy saving features and home quality, and (2) energy saving features and home comfort. Builders reported a 3.6 mean on the former question, and 4.0 mean on the latter question. This latter finding underscores (and to some extent also may reflect) the recent RNC program branding emphasis on the comfort dimension of homebuyer benefits.

On a 5-point scale, builders reported a mean rating of 3.2 regarding the perceived importance of the ENERGY STAR® brand in homebuyer home selection. A common follow-up comment was that consumers don't know the ENERGY STAR® brand, or perhaps don't (yet) know it in connection to new home energy efficiency. One respondent provided a 5 rating ("assuming they know about it"), while a couple of builders commented that homebuyers expect all new homes to have efficient features built in, and aren't willing to pay extra for them.

Exhibit A-6 summarizes builders' mean ratings on 12 subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important.

- Not surprisingly, market uncertainty and increased home cost loom largest in the minds of builders as important barriers to building and selling more homes that exceed code.
- A second tier of barriers included builder performance uncertainty, buyer access to financing, and several logistically-oriented barriers (focus too narrow, transaction / hassle costs, and information / search costs).
- The least important subjective barriers to energy efficiency in the minds of builders related to product and supplier availability and coordination, along with the procedure-related bounded rationality and organizational practice barriers.

Overall, the barriers related to why builders should or should not build more efficient new homes rose to the top of the list, while barriers related to how they can do so tended to be of lesser importance.[5]

[5] These barriers can be seen in their original survey form at Q38 in the appended Builder Survey.)

Exhibit A-6
Summary of Builders' Subjective Market Barrier Ratings

Builders' Subjective Market Barriers	*Mean*
Lack of buyer willingness to pay (market uncertainty)	4.2
Increased home cost (builder split incentives)	4.1
Builder performance uncertainty	3.1
Focus too narrow (not enough EE options)	3.1
Transaction / hassle costs	3.1
Information / search costs	2.8
Buyer access to financing	2.8
Service provider (subcontractor) unavailability	2.5
Product unavailability	2.2
Problems coordinating among subcontractors	2.2
Bounded rationality (difficulty in choosing EE options)	1.8
Organizational practices	1.8

Respondents were also asked several open-ended questions on factors that might help overcome market barriers. Comments include:

- Increased buyer demand (mentioned by five builders)
- Better buyer marketing / advertising and education (mentioned by four builders, only one of which also suggested better buyer rebates)
- Improved subcontractor / designer / supplier knowledge (two mentions)
- Utilities need to partner with each other and builders more (one mention)
- Need demonstration program with model homes (one mention)
- Utility R&D on more efficient HVAC and information on easier installation (one mention)
- Help in offsetting cash flow [problems] due to increased cost (one mention)

In summary, builders appear to believe that increased buyer demand (and willingness to pay) for more efficient new homes is the key driver of increased sales of more efficient homes.

Exhibit A-7 summarizes builder ratings of 14 possible factors that may be important in determining the energy efficiency of homes built outside RNC programs. Ratings were provided on a 5-point scale, where 5 was extremely important and 1 was not at all important.

- The builders' own personal experience was most important to them in determining the efficiency of non-program homes, followed closely by buyer willingness to pay and educational and informational support provided by utilities and relevant government

agencies (supporting ongoing utility and ENERGY STAR® involvement in RNC programs).

- A second tier of influencers included Title 24 contractors and architect / designers, along with HVAC contractors.
- A third tier of influencers included support and input from lenders, appraisers, and sales agent / realtors, along with product manufacturers and distributors, competitors, and in-house staff.

Exhibit A-7
Factors/Market Actors Influencing Efficiency of Non-Program Homes

Factors/Market Actors Influencing Efficiency of Non-Program Homes	***Mean***
Builder's own personal experience	3.9
Buyer willingness to pay incremental cost	3.6
Educational / information support from utilities	3.4
Educational / informational support from relevant government agencies	3.3
Title 24 contractor	3.1
HVAC contractor	3.1
Architects / designers	3.0
Mortgage and appraisal policies of lenders and appraisers	2.8
Product manufacturer	2.8
Other in-house personnel	2.8
Competing builders	2.7
Information and support from sales agents / realtors	2.7
Product distributor	2.5
Sales agents / realtors	2.3

The primary measure of builder *intentions* is builder perceptions about whether the proportion of their new homes that exceed code will increase, decrease, or stay the same over the next 2-3 years. Eight of the 14 builders expected the proportion to increase, while 5 expected the proportion to stay the same, and 1 was uncertain; none expected the proportion of homes built that exceeds code to decrease. While the expected trend was positive overall, only one builder's expectations of an increase were tied to an expected increase in customer demand; the other responses related to measure and design improvements. These included:

- Increased utility program support
- More efficient windows; windows that darken with increased temperatures; window treatments
- Improved HVAC systems; ceramic heating elements; more use of gas fuel
- Alternative lighting

- Prefabricated wall units
- R-rated roof tiles
- Tree shading
- Ceiling fans

A.2.3 Builder Actions and Sustainability

Three of the four Comfort Home builders said all of their 1999 tract homes were program homes; the fourth reported that 70% were program homes. The two SCE ComfortWise program builders said that 10% and 50% of their 1999 tract homes were program homes, while the EAH program builder reported that 90% of its 1999 tract homes were program homes.

- One SCE program builder indicated that it takes a closer look at HVAC and insulation in non-program homes, as a result of participating in ComfortWise. Both SCE builders market program homes differently from non-program homes by advertising the program affiliation, including logo and signage. Sales staff training was mentioned by one SCE program builder as a difference in how program versus non-program homes are marketed.
- The SoCalGas EAH builder attributes standard use of higher-SEER units (though the reported range was 10 to 12 SEER) and low-flow toilets in non-program homes to participation in the EAH program. This builder also markets program homes differently from non-program homes by leveraging the program in advertising and promotional materials, and by educating consumers via the upgrade options.
- The PG&E Comfort Home builder reporting 70% of tract homes were program homes indicated that it markets program homes differently from non-program homes by leveraging the PG&E brand in placards and media advertising, and by providing home tours.

Two of the four PG&E program builders reported attendance at utility-sponsored training sessions in 1999 related to more efficient new home design and construction; none of the SCE or SoCalGas program builders reported doing so. One PG&E participant said the training influenced their increased focus on ducts, and the other said they became more aware of contract language specifically requiring compliance with program specifications.

While three of the four Comfort Home builders, both SCE ComfortWise builders, and four non-program builders reported awareness of the DOE's ENERGY STAR® Homes Program, none of the 14 builders reported having participated in 1999. Lack of awareness of program specifics and perceived lack of need/value were the most common RNC program builder reasons for not having participated; one PG&E Comfort Home builder also questioned its longevity. Non-program builders mentioned lack of public recognition of the ENERGY STAR® brand, lack of personal familiarity with the program, and lack of perceived need/value as reasons for not participating in the ENERGY STAR® Homes Program. No builders professed familiarity with program participation requirements, although one Comfort Home builder indicated they were similar to Comfort Home windows, insulation, and HVAC standards and recommendations, along with energy-efficient appliances.

Lack of program awareness and program specifics was the primary reason non-participating builders had not done so; in a couple of cases economic considerations were mentioned, and one builder specifically mentioned that he needed to have rebates that covered the entire incremental cost. Two of the PG&E non-program builders reported participation before 1999, though one referred to the 5-Star program. One PG&E non-program builder reported attending PG&E-sponsored training, with the result that it looked into getting its HVAC provider to incorporate ductwork.

Early in the Builder Survey, prior to getting into detail about RNC programs or energy efficiency criteria, builders were asked how regularly they promote energy efficiency to homebuyers: always (5), often (4), sometimes (3), rarely (2), or never (1). On this basis, the mean rating was 4.0, with non-program builders claiming almost as much energy efficiency advocacy as program builders claimed.

Builders were also asked how regularly they integrate HVAC and duct design, to promote correct HVAC sizing; those who reported doing so frequently were asked how they went about this. Builders provided a rating of always (5), often (4), sometimes (3), rarely (2), or never (1); on this basis they reported a very high mean of 4.6. Six of seven program builders said they always integrate HVAC and duct design (the seventh did not provide a response); five of the seven non-program builders reported always doing so, while one said sometimes and one said rarely.

- Some builders indicated that they accomplished this integration by relying on architects, mechanical engineers, Title 24 consultants and/or calculations, or (in several cases) the HVAC subcontractors.
- More convincing responses regarding the methods for integrating HVAC and duct design and ensuring correct HVAC sizing included use of visual duct inspection, duct blasters, appropriate vent, thermostat, and equipment location, reduced bending of duct systems, taking a zone approach, use of split systems, and basing sizing on square footage and tonnage.

The two main measures of builder *sustainability* were likelihood of builder continuation in the RNC program, and likelihood of continued practice changes even in the absence of the program. Regarding the first measure, all seven program builders were extremely or very likely to continue their participation, offering strong support for sustainability of supply-side movement toward greater energy efficiency. (The four PG&E non-program builders said they were unlikely to participate in the future, with one mentioning the need for rebates to cover incremental costs, and another saying "the help is not there." SCE/SoCalGas non-program builders were, at best, somewhat likely to participate in the future, with one builder mentioning financial issues and another indicating he planned to learn more about the utility programs.)

Regarding the second measure, the one PG&E program builder who built homes outside the program reported no changes in building practices in non-program homes as result of the program. One SCE ComfortWise program builder indicated it was taking a closer look at HVAC and insulation, and would continue those changes in the absence of the program. The SoCalGas EAH program builder reported higher-efficiency (though only 10-12 SEER) HVAC systems and standard use of low-flow toilets in non-program homes, and said he

would continue those practices without the program. Although these results are very anecdotal, they provide at least some support for the notion of sustainability of program effects beyond the program itself.

A.3 ARCHITECTS/DESIGNERS

Seven architects were interviewed in PG&E's service territory, 7 in SCE/SoCalGas service territory, and one in SDG&E's service territory, for a total of 15.[6] A subset of architects was identified through earlier builder interviews; one architect interviewed had designed PG&E Comfort Homes in 1999, and one had designed SoCalGas EAH homes in 1999.

A.3.1 Architect/Designer Awareness/Knowledge

Architect/designers displayed mixed awareness of the RNC programs, and a diverse array of information sources they would consult regarding energy efficiency. PG&E's program appears to have higher visibility than the other RNC program sponsors among architects. Architect/designers appear at least as knowledgeable as any other supply-side market actors about the home features that impact energy efficiency, underscoring their potential as market transformation catalysts. (For the remainder of this appendix, architect/designers are referred to as "architects.")

Eight of the 15 architects reported no unaided program awareness of any type, while 5 reported unaided awareness of program that were not the RNC programs themselves: Edison Energy Design Resources, SMUD, "Gas Company 5-Star program," California Windows Initiative, and high-efficiency water heater and old appliance trade-in programs. The PG&E Comfort Home, SCE ComfortWise, and ENERGY STAR® Homes Programs each was mentioned by one architect on an unaided basis. Aided responses are presented in Exhibit A-8 below.

Exhibit A-8
Architect Program Knowledge and Awareness

Program/Feature	Number of Architects
PG&E Service Territory	
Aided Awareness of Comfort Home	5 of 7
SCE/SoCalGas Service Territory	
Aided Awareness of ComfortWise	2 of 7
Aided Awareness of EAH	4 of 7
SDG&E Service Territory	
Aided Awareness of ComfortWise	0 of 1
All Service Territories	
Aided Awareness of ENERGY STAR® Homes	7 of 15

Five of the 15 architects were aware of energy efficiency training provided by utilities in 1999; four mentioned PG&E as a sponsor, while one mentioned SCE. One architect had attended a

[6] As in some other market actor groups, it was especially challenging to identify and interview architects in SDG&E's service territory who did significant tract home work.

PG&E training session, but reported no significant changes in design practices as a result. Architect awareness of energy efficient tract home features is presented in Exhibit A-9, and the most common resources architects would go to for help and information to learn more about energy-saving design practices or home features are listed in Exhibit A-10.

Exhibit A-9
Architect Awareness of Energy Efficient Tract Home Features

Energy Efficient Tract Home Feature	Number of Architects
Roof Insulation	12
R-30	8
R-38	3
R-19	1
Wall Insulation	11
R-13	4
R-19	4
R-15	1
R-25	1
R-28	1
Double/Triple Paned Windows	9
HVAC (11 and 12 SEER)	4
Water Heaters	4

Exhibit A-10
Most Common Resources Mentioned

Resource Architect Would go to for Help and Information to Learn More About Energy-Saving Design Practices or Home Features	Number of Architects
CEC	2
PG&E, Pacific Energy Center	2
Title 24 Consultants	2
Glass company and manufacturers	1
Local suppliers	1
Manufacturer and supplier brochures; Web sites	1
Library and computer	1
Title 24 documents	1
EnerComp (software)	1
Architectural publications	1
AIBD (American Institute of Building Designers) workshops	1

A.3.2 Architect/Designer Perceptions/Evaluations and Intent

In contrast to builders, architects perceive fairly high buyer demand for more efficient tract homes.[7] Architects felt they have at least moderate influence on whether a tract home or development exceeds code. They appear to have realistic expectations of the cost of exceeding code by 10%, and state categorically that if builders will pay for it they see no other barriers to designing tract homes to that standard. Architects also seem to recognize the role that buyers must play in driving the design of more efficient new tract homes, but perceive that barrier as secondary to the barrier posed by builder cost-sensitivity. Architects also expressed some concern about the tradeoffs between energy-efficient tract home features and other aspects of home design.

Architects were asked to rate the degree of buyer demand for new SFD tract homes that exceed Title 24, on a scale of a lot (5), some (4), little (3), very little (2), or none (1). Four architects said "a lot," seven said "some," two said "very little," and two said "don't know." The mean response was 4.0, compared to 3.5 for builders. Input from builders was the most common source of information influencing architect ratings (10 mentions), followed by input from buyers (five mentions), and input from sales agents, SCE, and third-party market research (one mention each).

The 10 architects who reported designing homes that exceeded Title 24 in 1999 also rated their perceived influence on whether a tract home exceeds Title 24 code, on a scale of extremely (5), very (4), somewhat (3), not very (2), or not at all (1) influential. On that basis, one architect said he was extremely influential, while three said very influential, one said somewhat, four said not very, and one said not at all influential, yielding a mean of 2.9, corresponding to "somewhat influential." The one architect claiming extreme influence in this decision said this was because he also was a Title 24 consultant. Architects were virtually unanimous in saying that builder/developer budgets and preferences control whether or not a home exceeds Title 24; one architect commented that while he (they) can design homes to exceed code, builders have veto power. Another architect commented that some custom buyers are more willing to pay for energy efficiency than are tract builders. Another described the decision as "half developer and half buyer request."

Architects were posed a scenario in which they designed a tract home that exceeds Title 24 by 10%, without any builder or buyer incentives, and asked how much extra this home would cost. Several architects reported from 2% to 5%, others reported from $1000 to $3000. When they were then asked to assume that builders would pay 100% of the incremental cost of exceeding Title 24 by 10%, and asked what other barriers to designing more efficient homes remained, architects were unanimous in saying "nothing."

Exhibit A-11 summarizes architects' mean ratings on 11 subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important. From the architects' perspective, the paramount barrier to designing more efficient tract homes is builder policies and procedures that hinder the use of energy-efficient designs. While buyer-

[7] Architects were not asked to assess buyer willingness to pay because they were not hypothesized to have enough direct contact with tract buyers to make this assessment.

based market uncertainty also seen as a key barrier, architects perceive it as subservient to builders' cost-sensitivity.

Exhibit A-11
Summary of Architect's Subjective Market Barrier Ratings

Architects' Subjective Market Barriers	*Mean*
Organizational practices (builders)	4.0
Increased home cost	3.6
Lack of buyer willingness to pay	3.4
Tradeoffs in other aspects of home design required by EE features	3.3
Information / search costs	3.1
Buyer performance uncertainty	2.7
Product unavailability	2.4
Architect performance uncertainty	2.3
Transaction / hassle costs	2.1
Focus too narrow (not enough EE options)	1.9
Bounded rationality (difficulty in choosing EE options)	1.9

The primary measure of architect *intentions* is their perception of whether the proportion of their new home designs that exceed code will increase, decrease, or stay the same over the next 2-3 years. Six of the 15 architects expected the proportion to increase, while two expected the proportion to decrease, and seven expected it to stay the same. Architects generally anticipated no changes in their methods of addressing energy efficiency issues in tract home design.

- One architect commented that any changes in her methods of addressing energy efficiency issues in tract home design would depend on availability and cost of energy-efficient features. Similarly, another architect commented that any practice changes will depend on "better and cheaper" energy-efficient products.
- One architect indicated he would pay more attention to solar technology and HVAC efficiency.
- Declines in the proportion of designs that exceed code were expected "because standards are getting more strict," and because of liability issues related to Legionnaires' disease (tied to certain ducting practices).

A.3.3 Architect/Designer Actions and Sustainability

Architects reported fairly frequent promotion of energy efficiency, but limited program participation and utility-sponsored training in 1999. However, the two architects who designed program homes attributed practice changes to the programs, and said they would continue these practices even in the absence of the programs. Also, architects overall reported a fairly high level of non-program design of tract homes that exceed code, focused on the core high-efficiency features of HVAC, windows, and insulation.

Architects were asked to rate how often they promote energy efficiency and energy-efficient features to tract builders and developers, on a scale of always (5), often (4), sometimes (3), rarely (2), or never (1). On that basis, five architects said they always promote energy efficiency, two said they often do, five said sometimes, and three said rarely, yielding a mean of 3.6.

As mentioned above, 1 of the 15 architects had designed Comfort Homes in 1999, and one had designed EAH program homes. None had designed homes for the ComfortWise or ENERGY STAR® Homes Programs. The Comfort Home designer was part of a work group within the program builder; the SoCalGas designer was not.

- The Comfort Home designer reported that, as a result of program participation, he is "more concerned with window placement, size, and quantity" in new tract homes in general. He also indicated he would continue this approach even in the absence of the program, because the payback is significant as far as utility bills and comfort are concerned.
- The EAH designer had worked with two program builders in 1999, designing a total of nine homes, and program participation entailed higher-SEER air conditioners than in non-program homes. This architect reported paying more attention to insulation and house orientation (whether the bulk of the doors and windows are facing north-south or east-west). He also reported that he would continue these practices even in the absence of the program, because "it makes a better quality home – in coastal homes there are so many windows that you need to pay attention to energy efficiency."

Ten of the 15 architects reported having designing homes that exceeded code outside the RNC programs. The percentage of 1999 non-program tract home designs that exceeded code ranged from 20% to 100%, with no clustering of responses. As reported above, builders and developers are the key drivers of whether and how often homes and developments are designed and built to exceed Title 24. Methods used to exceed Title 24 in 1999 tract homes included:

- Low-e windows, window tinting, less overall window area
- High-efficiency HVAC systems
- Radiant heating, gas heating
- Higher insulation R-values
- Better duct sealant
- High-end doors, wall assemblies.

Five of the 15 architects were aware of energy efficiency training provided by utilities in 1999; four mentioned PG&E as a sponsor, while one mentioned SCE. One architect had attended a PG&E training session, and reported no significant changes in design practices as a result.

The main measurement of *sustainability* among architects was the proportion of program designers attributing changes in practices to the program, which they would plan to continue even in the absence of the program. As reported earlier in this section, both architects that

designed RNC program homes in 1999 attributed meaningful practice changes to the program and said these would be continued even without the program.

A.4 TITLE 24 CONSULTANTS

Eight Title 24 consultants were interviewed, three each in the PG&E and SCE/SoCalGas service territories, and one in SDG&E's service territory; one consultant volunteered that he worked in both SCE/SoCalGas and SDG&E service territories. The sample frame consisted of the CABEC database of certified energy consultants, which is likely to mean that these are more forward-thinking, enterprising Title 24 consultants than the norm.

A.4.1 Title 24 Consultant Awareness/Knowledge

While most Title 24 consultants were aware of the RNC programs, the California programs weren't as top-of-mind as the ENERGY STAR® Homes Program. It also was notable that two of the eight mentioned EEMs unprompted. Among the utilities, PG&E appears to enjoy the most awareness in the Title 24 consultant community, followed by SoCalGas (see Exhibit A-12). CABEC clearly is an important market influencer among Title 24 consultants, as is the CEC. Title 24 consultants appear to have the knowledge of energy efficiency drivers and breadth of information sources needed to be a primary supporter of more efficient new homes, provided their (perceived) role in the new construction process allows them to wield sufficient influence.

Exhibit A-12
Title 24 Consultants Program Awareness and Knowledge

Program	**Number of Title 24 Consultants**
Unaided Awareness	
PG&E Comfort Home	1
SCE/SDG&E ComfortWise	1
ENERGY STAR® Homes Program	4
EEMs	2
Aided Awareness	
PG&E Comfort Home	3
SCE/SDG&E ComfortWise	1
SoCalGas EAH	1
ENERGY STAR® Homes Program	2

Title 24 consultants' awareness and knowledge of energy efficient tract home features and energy efficient training are presented in Exhibits A-13 and A-14. Note in Exhibit A-15 that Title 24 consultants are more dependent on public sector agencies and associations for information than other market actors.

Exhibit A-13
Title 24 Consultant Awareness/Knowledge of Energy Efficient Tract Home Features

Energy Efficient Feature	Number of Title 24 Consultants Aware
High-efficiency HVAC	4
Low-e windows	4
Double/triple-pane windows	3
Water heater	3
Roof insulation	3
Wall insulation	3
Glazing area	2
Wood/vinyl window frames	2
Furnace/heating system	1

Exhibit A-14
Title 24 Consultant Energy Efficiency Training Awareness

Energy Efficiency Training Program, Sponsor Utility	Number of Title 24 Consultants Aware	Number of Title 24 Consultants Who Have Attended Training in 1999
PG&E	4	1
SoCalGas	3	
CABEC	3	2
SDG&E	2	1
CHEERS	2	1
SCE	1	
CEC	1	

Exhibit A-15
Most Common Resources Mentioned

Resource Title 24 Consultant Would go to for Help and Information to Learn More About Energy-Saving Design Practices or Home Features	**Number of Title 24 Consultants**
CEC (California Energy Commission)	4
CABEC (California Association of Building Energy Consultants)	3
Manufacturers (windows, insulation, mechanical equipment)	2
PG&E, PG&E Energy Center	2
Utility Web sites	1
CHEERS	1
California Windows Initiative	1
DOE	1
ASHRAE	1
AEE	1
Builder Online	1
EREN	1
OIKOS	1

A.4.2 Title 24 Consultant Perceptions/Evaluation and Intent

Along with many other RNC market actors, Title 24 consultants see the primary barriers to more efficient new tract homes (i.e., those that exceed code) being buyer unwillingness to absorb the incremental up-front cost, due to insufficient perceived value in doing so. Most Title 24 consultants expect the proportion of tract homes that exceed code to stay about the same in coming years.

Title 24 consultants were asked to rate the degree of buyer demand for new SFD tract homes that exceed Title 24, on a scale of a lot (5), some (4), little (3), very little (2), or none (1). On that basis, four consultants said "very little," and one each said "a lot," "some," "little," and "don't know."[8] The mean response was 2.9, centered on the "little" response. On a related question, only one of the eight consultants had reviewed designs for tract homes in 1999 that purposely exceeded Title 24.[9] That consultant reported that Title 24 consultants are not very influential in determining whether a tract home intentionally exceeds code; when asked how

[8] One Title 24 consultant in SCE/SoCalGas service territory said he perceives "a lot" of buyer demand for energy-efficient homes.

[9] This consultant reported using low-emissivity glazing and improved domestic hot water systems as methods for exceeding code.

influential Title 24 consultants are in determining how a home exceeds code, the consultant could not say.

Exhibit A-16 summarizes Title 24 consultants' mean ratings of 12 subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important.

- As did builders, Title 24 consultants perceive increased home cost and lack of buyer willingness to pay as the primary barriers. Unlike builders, however, the consultants rated buyer access to financing as a fairly important barrier, perhaps associated with their (in some cases) top-of-mind mentions of EEMs.
- The second tier of subjective barriers centered around logistical, "how to" issues, except for performance uncertainty among the Title 24 consultants themselves.
- The low ratings for the final four barriers suggests that Title 24 consultants are not concerned about their ability to identify high-impact energy-saving features, or to maintain integrity and flexibility in the overall home design. Likewise, they are not concerned about builder or buyer access to energy-efficient options.

Exhibit A-16
Summary of Title 24 Consultants' Subjective Market Barrier Ratings

Title 24 Consultants' Subjective Market Barriers	*Mean*
Increased home cost (builder split incentives)	4.5
Lack of buyer willingness to pay (market uncertainty)	4.0
Buyer access to financing	3.6
Service provider (subcontractor) unavailability (problems finding and coordinating knowledgeable subcontractors)	3.3
Information / search costs	3.1
Organizational practices	3.0
Consultant performance uncertainty	2.9
Focus too narrow (not enough EE options)	2.4
Transaction / hassle costs	2.4
Tradeoffs in other aspects of home design required by EE features	2.3
Bounded rationality (difficulty in choosing EE options)	2.1
Product unavailability	1.6

The key *intention* measurement in the Title 24 consultant interview probed their estimate of whether the proportion of new tract homes that exceed code to increase, decrease, or stay the same over the next 2-3 years. While this question was broader than a measure of consultant "intent," it compares to similar questions asked of most other RNC supply-side market actors. In this case, all but one expected the proportion to stay the same. One consultant expected an increase, saying he "will push for more high-efficiency solutions."

A.4.3 Title 24 Consultant Actions and Sustainability

Title 24 consultants report that builders generally are interested in merely complying with (not exceeding) code, and primarily want input on strategies to increase efficiency when a design does not comply. In terms of their energy efficiency knowledge (see Section A.4.1), attendance at energy efficiency training, and self-reported orientation toward promotion of designs that exceed code at least some of the time, Title 24 consultants appear to be candidates for supporting energy-efficient homes on a more explicit basis. On one hand, there does not appear to be any obvious self-interest for Title 24 consultants in promoting higher-efficiency homes more aggressively, nor is there an obvious mechanism for their doing so. On the other hand, these consultants — at least the subset targeted for these interviews who are CABEC certified energy consultants — are likely to place intrinsic value on energy efficiency, simply by virtue of the profession they've chosen.

Early in their interviews, Title 24 consultants were asked to describe how they report results of their compliance reviews to tract builders, and also to describe changes in this process over the last year or two. Six consultants use Energy Pro software to generate the reports, while three use Micropas (including one who used both). None of the consultants indicated any recent changes in how they work with tract builders or report results.

- Two of the three Micropas users indicated they typically provide information to builders on the degree to which designs exceed code (when that is the case). Conversely, Energy Pro is associated with pass/fail compliance reports. The one consultant who worked in both SCE/SoCalGas and SDG&E service territories used both programs, and said Micropas is typically used for tract (subdivision) work.
- All of the Title 24 consultants indicated that they provide computer printouts or reports of the compliance review, and six of the eight reported that they provide input to builders on how a design that fails to comply can be made to comply with code.

Two of the eight consultants indicated that they work differently with different builders; one was the same consultant that worked in both SCE/SoCalGas and SDG&E service territories, and the other was in PG&E's service territory. They said their work approach varies across builders because some are more interested in information beyond pass/fail than are others, and some are more interested in energy efficiency strategies than are others. Examples given were builders who care more about glazing area or performance, or hydronic heating. One consultant mentioned that the builders' target niche (e.g., low versus high income) affects the working relationship.

Title 24 consultants were asked to rate how often they promote tract designs that exceed code to builders, and how often builders or developers ask for input on how to exceed code, on a scale of always (5), often (4), sometimes (3), rarely (2), or never (1). The mean rating was 3.4, centered between the "sometimes" and "often" categories. Conversely, most consultants said builders rarely ask for input on how to design homes that exceed code (two said "never"), with a mean rating of only 1.8.

- One Title 24 consultant reported reviewing one tract home design and several custom home designs for homes that were (or will be) built under the SoCalGas EAH program

— this consultant indicated the homes did not differ significantly from other homes, and had not affected the approach to working with builders.

  - Those designs comprised 5% of the designs they reviewed in 1999. Low-e glazing and improved domestic hot water systems were reported as methods used to exceed code in these homes. Title 24 consultants who had not reviewed designs that intentionally exceed code generally said it was because builders want to meet code, but not exceed it, to avoid any unnecessary up-front cost.

- One Title 24 consultant reported having reviewed designs for a builder named Brookfield in 10 developments in the desert area, which were (or will be) built under the ENERGY STAR® Homes Program. While this consultant did not specify features of the design that made the homes meet the program requirements, the implication of his response was that the design was perhaps fairly standard but would produce greater energy impacts in the desert climate. This consultant reported no lasting changes in working with builders as a result of this experience.
- One consultant commented, in reporting that he had not reviewed designs for the SCE ComfortWise program, that they were prevented from doing so because there is a "sole contractor" (presumably ConSol) that does that work.

Two consultants had attended SoCalGas-sponsored energy efficiency training in 1999, two had attended CABEC-sponsored training, and one each had attended training sessions sponsored by PG&E, SDG&E, and CHEERS.

A.5 HVAC CONTRACTORS

Fifteen HVAC contractors were interviewed for this study; six were in PG&E's service territory, four were in the SCE/SoCalGas service territory, three were in SDG&E's service territory, one HVAC contractor worked in both the SCE/SoCalGas and SDG&E territories, and one volunteered that his firm worked statewide.

A.5.1 HVAC Contractor Awareness/Knowledge

HVAC contractors appear knowledgeable about HVAC system efficiency criteria, and fairly knowledgeable about the home features having the greatest interactive effects with HVAC efficiency. Contractors most often mention windows and insulation as the home features that affect HVAC sizing and that are involved in balancing HVAC size against other features. These contractors had less awareness of utility RNC programs or associated training, and knew very little about RNC or ENERGY STAR® Homes Program participation requirements.

HVAC contractors were asked on an open-ended basis how they typically define energy-efficient or high-efficiency HVAC systems, in terms of design, equipment, installation, and/or testing practices. Most contractors evidenced convincing knowledge of high-efficiency HVAC criteria; in some cases where specific SEER, AFUE or insulation R-levels were not provided, the overall response nonetheless indicated that the contractor knew how to identify the appropriate criteria (even if not committed to memory). As summarized in Exhibit A-17, this knowledge was fairly well distributed across the utility service territories.

- The contractor whose business covers the whole state mentioned fully-ducted returns, sealed; 11-12 SEER; 90% AFUE
- The contractors who covered SCE/SoCalGas and SDG&E service territories mentioned 12 SEER; 90%+ AFUE.

Exhibit A-17
HVAC Contractors
Knowledge of Energy-Efficient or High-Efficiency HVAC Systems

Energy Efficient Feature	PG&E	SCE/So CalGas	SDG&E
10-12 SEER	●	●	●
13-17 SEER		●	●
AC Higher SEER	●		
4.2-8.0 Duct R-value	●		●
Duct Sealing	●		●
Duct Testing	●	●	●
90%+ AFUE	●	●	●
AFUE Furnaces, Water Heater	●		
Insulate Plenums	●		
Duct and Attic Insulation			●
Programmable Setback Thermostat	●		●

Although HVAC contractors indicated fairly accurate knowledge of energy efficiency criteria, they were much less aware of the specific RNC program participation requirements affecting HVAC system design, equipment, installation, or testing. Occasionally they provided comments such as "none/no requirements," or indicated that the requirements were redundant with common practice, but typically the contractors simply admitted they didn't know the requirements.

- One contractor who had installed HVAC in a handful of ENERGY STAR® Homes in 1999 said it was a "hassle to keep up with 24 models and associated paperwork."
- One contractor who had installed HVAC in approximately 100 Comfort Homes in 1999 reported that testing was "a pain, hard to deal with."
- Another contractor in PG&E service territory who was not a program participant recalled more fine-tuned testing, duct sealing, and inspections as Comfort Home program requirements regarding HVAC systems.
- One contractor in SCE/SoCalGas service territory recalled SCE ComfortWise requirements including projection and verification of energy savings.

HVAC contractor program awareness is presented in Exhibit A-18.

Exhibit A-18
HVAC Contractor Program Awareness

Energy Efficient Feature	Number of HVAC Contractors Aware
Unaided Awareness	
PG&E Comfort Home	3
PG&E (not any specific program)	3
PG&E RCP Program	1
SCE ComfortWise	1
SoCalGas "HVAC Combo Incentive" Program	1
ENERGY STAR® Homes Program	3
Aided Awareness	
PG&E Comfort Home	4
SCE ComfortWise	3
EAH	3
SDG&E ComfortWise	2
ENERGY STAR® Homes Program	6

HVAC contractors also were asked to identify the features of new tract homes that most often affect the final energy efficiency of the HVAC system. Windows, insulation, and shade tree planting were included as prompts to avoid any confusion, though they added a risk of bias in contractor responses as a result. Windows and insulation were each mentioned by most contractors as factors affecting the cooling load, while one to two contractors each mentioned HVAC zoning, tight house/structure, vaulted ceilings, and shade tree planting. When asked how the sizing of the HVAC system is balanced against these other home features, contractors most often said that as the number of windows increases, or amount of insulation decreases, the size of the HVAC is increased. Other comments included:

- If installing dual-pane windows and insulation, don't need high SEER unit
- Manual J worst case orientation, add dampers, air balancing
- The more vaulted ceilings, the larger the HVAC
- How air is distributed, air registers; ducts and registers (used to adjust to the cooling load).

HVAC contractors also were asked if the ways this balancing was done had changed over the last couple of years, in their experience. Among those who noted changes either in how HVAC system balancing occurs, or the factors driving the changes, responses included:

- More use of zonal systems (PG&E service territory)
- People want more vaulted ceilings, windows, windows facing sun, don't oversize as much (PG&E)

- Doing more HVAC system balancing, related to windows and insulation (PG&E)
- By using tools and technologies – psychrometer balance, latent versus relative humidity (PG&E)
- More high-efficiency windows in tract homes (PG&E)
- Rounded rather than rectangular air distribution; more of a perimeter system instead of inside walls and ceiling (SDG&E service territory).

A.5.2 HVAC Contractors Perceptions/Evaluation and Intent

HVAC contractors perceive increased buyer demand for energy efficiency in recent years, and expect increasing HVAC efficiency in tract homes in the coming years. From their position, typically one step removed from homebuyers, HVAC contractors perceive incremental measure cost and builder conservatism and price sensitivity to be the primary barriers to greater HVAC efficiency, along with uncertainty about the information needed to accommodate interactive effects with other home features. Buyer willingness to pay is seen by contractors as a barrier, but less so than among builders and others with more frequent buyer contact. Overall, contractors portray themselves as active proponents of HVAC efficiency, and as the decision-makers regarding system design and duct installation methods. They see Title 24 consultants, however, as the typical decision-maker regarding HVAC equipment and insulation efficiency levels.

Most (13 of 15) HVAC contractors perceive increased homebuyer demand for energy-saving over the last 5 years, while the other two perceive unchanged demand. More consumer information and awareness of energy efficiency (as distinct from any perceived shift in basic homebuyer values, or external factors) was the predominant reason given for this increase. One contractor also mentioned greater access to information via the Web. Several contractors in PG&E's service territory attribute the increase in awareness to PG&E programs and advertising. Two contractors also attributed the increase to manufacturer or distributor advertising. One contractor mentioned the "good track record" of high-efficiency equipment, while another mentioned that HVAC unit pricing had become more competitive.

Exhibit A-19 below summarizes HVAC contractors' mean ratings on eight subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important. HVAC contractors place less emphasis on the buyer willingness to pay barrier than do other market actors, possibly because they have minimal interaction with new homebuyers. As usual, increased cost was a primary barrier, in this instance joined by contractors' perceptions of organizational practice barriers at the builder level. Lack of information on interactive effects also was perceived as a relatively important barrier, indicating an opportunity for further attention through RNC and related programs and training. Coordination with other subcontractors whose work impacts HVAC efficiency, and information/search costs per se, were the least worrisome contractor barriers.

Exhibit A-19
Summary of HVAC Contractors' Subjective Market Barrier Ratings

HVAC Contractors' Subjective Market Barriers	*Mean*
Increased home cost	3.7
Organizational practices (builders)	3.5
Lack of information on interactive effects between HVAC and other home features	3.4
Lack of buyer willingness to pay	3.3
Consultant performance uncertainty	3.3
Concern about design / equipment reliability and increased callback liability (hidden costs)	3.3
Service provider (subcontractor) unavailability (problems finding and coordinating with other subcontractors who affect HVAC EE)	2.9
Information / search costs	2.9

HVAC contractors were asked to rate the frequency with which they, the builder, the buyer, or a Title 24 consultant make decisions regarding each of four activities related to overall HVAC efficiency. Ratings were provided for each of four market actors on each of the four activities on a scale of always (5), often (4), sometimes (3), rarely (2), or never (1). Results are summarized in the Exhibit A-20.

Exhibit A-20
Summary of HVAC Efficiency Decision Influence (Mean Ratings)

Dimension of HVAC System Design	*HVAC Contractor*	*Builder*	*Buyer*	*Title 24 Consultant*
Equipment's rated efficiency level	2.3	2.4	1.8	3.5
System design	4.3	2.3	1.5	2.5
Different duct installation methods	4.5	2.3	1.5	1.9
Particular R-value of duct insulation	2.0	1.8	1.3	4.7

Based on this response profile, Title 24 consultants most often determine the specific efficiency level for HVAC equipment and insulation, most likely in the context of what values are needed to meet (not exceed) Title 24 (based on builder and Title 24 consultant interview results). In contrast, the HVAC contractors claim the predominant influence on system design and duct installation methods. Builder involvement in these decisions typically ranges from sometimes to rarely, and buyers are rarely or never involved, at least as perceived by the HVAC contractors.

In terms of HVAC contractor *intentions*, contractors were asked how likely they were to specify or recommend high-efficiency HVAC system design, installation, equipment, or testing in new tract homes, without builder specification or utility program support. They

also were asked to estimate whether the proportion of HVAC systems in new tract homes exceeding code was likely to increase, decrease, or stay the same in the next 2-3 years.

Regarding the first question, contractors rated whether they were extremely (5), very (4), somewhat (3), not very (2), or not at all (1) likely to specify or recommend high-efficiency HVAC without builder specification or utility support for them. Eight of the 15 contractors said they were extremely likely to do so. Four of the remaining seven contractors said they were very likely, two were somewhat likely, and one was not at all likely to specify or recommend high-efficiency HVAC (this contractor in SDG&E's service territory stated flatly that the builders "will not pay" for higher efficiency). The mean rating was a correspondingly high 4.2. Reasons for the generally high likelihood of specifying or recommending high-efficiency HVAC included:

- Homeowners have lower bills / save money
- Homeowners achieve better long-run savings
- (Increased) customer satisfaction / better system performance
- Higher price means more profit; less maintenance, noise
- As SEER increases so does warranty
- Contractor believes in energy conservation.

Regarding HVAC contractor expectations of trends in the proportion of new tract homes with HVAC systems exceeding code in the next 2-3 years, eight expected an increase and seven expected no change. Those expecting an increase were then asked to estimate the proportional increase in non-program homes where HVAC systems would exceed code; responses ranged from 10% to 80%, with a mean of 34%. A subset of contractors indicated changes that were likely in the ways they will address energy efficiency in tract homes in the next 2-3 years. Responses included higher-SEER and AFUE units, zoning, tighter ducts, and greater buyer education / awareness.

A.5.3 HVAC Contractor Actions and Sustainability

HVAC contractors claimed to factor in energy efficiency in tract home recommendations on a fairly regular basis, although there also is evidence of HVAC system over-sizing. One-half reported recent changes in how they size, install, or test HVAC systems or ducts in tract homes, with some attribution to utility program and training influences. Most tract home HVAC systems remain in the 10 SEER range, while most gas furnaces are in the 80-89% AFUE range. While builders often ask for HVAC contractor input on how to meet Title 24, they rarely ask for input on how to exceed code, as seen elsewhere in this report.

The 15 HVAC contractors were asked to describe how they size and select the CAC for a new tract home. Responses ranged from software tools, to other market actors, to information resources, to "rule-of-thumb." Software tools included Micropas, Title 24 calculations, heat gain calculations, cooling and heating loads, ACCA manual D, J, H, and / or L, Right Suite, "300-350 sq. ft. / ton," Quick Pen or Forester, Carrier software, architect and builder input, and "American Standard / ES 2000 Load and Duct Design."

Seven of the 15 HVAC contractors reported recent changes in how their firm approaches sizing, installing, or testing HVAC equipment or ductwork for new tract homes. Changes in methods included more zone control, higher-efficiency equipment, fully ducted and sealed returns, new software, more rigorous testing, and duct blasting. Reasons for these changes included participation in the Comfort Home (two mentions) and Residential Performance Contracting programs, customer demand, the SoCalGas program (mentioned by a nonparticipant), to keep up with changing technology, and desire for competitive differentiation.

HVAC contractors also were asked how much beyond the minimum needed to meet a tract home's cooling loads they recommend or allow for a safety margin. Responses ranged from zero to 25%, the median was 15%, and the mean was 14%.

Contractors also rated their frequency of factoring in energy efficiency when recommending HVAC systems for tract homes. The scale was always (5), often (4), sometimes (3), rarely (2), or never (1). Seven contractors reported always recommending energy efficiency, three said they do so often, three sometimes, one rarely, and one never (due to builder resistance to higher costs), resulting in a mean of 3.9.

HVAC contractors were asked to estimate the distribution of the systems they installed in new tract homes in 1999, across three categories. These categories (and their mean percentages) were 10 SEER or less (72%), at least 10 SEER up to 12 SEER (14%), and 13+ SEER (14%).

- All but 3 contractors said 70% or more of their 1999 tract installations were 10 SEER or less; with the other 3 reporting values of 10%, 25%, and 40%. Conversely, while most reported no installations in the 13+ SEER category, one reported 90% and one reported 70% in that category.
- Three contractors reported shifts from the 10 SEER and under category to the 10-12 SEER category in the past couple of years, and attributed the shift to lower cost for high-efficiency HVAC, increasing home values driving demand for more efficient HVAC, and use of energy efficiency as tract upgrades to meet consumer demand.

HVAC contractors also were asked to estimate the distribution of the gas furnaces they installed in new tract homes in 1999, across three categories. These categories (and their mean percentages) were under 80% AFUE (17%), 80-89% AFUE (77%), and 90% or higher AFUE (6%).

- Only 3 of the 15 contractors reported sales of under 80% AFUE systems (90%, 80%, and 75% of total sales for the 3 contractors). Three others reported sales in the 90% or higher AFUE category (representing 40%, 25%, and 10% of total sales for the 3 contractors).
- When asked if any shifts in these percentages had been noted in the last couple of years, the contractor serving both the SCE/SoCalGas and SDG&E service territories commented that 90% or higher AFUE systems "used to be more popular with rebates," and a Comfort Home contractor credited PG&E rebates with a modest shift toward 90% or higher AFUE systems.

Four of the 15 HVAC contractors had installed HVAC systems in RNC program tract homes in 1999. Two installed systems in both Comfort Homes and ENERGY STAR® Homes, one installed systems in SDG&E ComfortWise homes, and one other non-Comfort Home contractor in PG&E service territory installed systems in 200 ENERGY STAR® Homes.

- One of the Comfort Home and ENERGY STAR® Homes installers worked with Yamato and Granville Homes in the Comfort Home program, installing 200 systems. This contractor had installed "thousands" of Comfort Home systems in prior years. One-fifth (20%) of its 1999 tract installations were in Comfort Homes. This contractor credited program involvement with increasing understanding of system testing and duct tightness, though he was unsure if these changes would continue without the program. This same contractor said 1% of its 1999 tract installations (equating to a handful) were in ENERGY STAR® Homes, and that keeping up with the various models and related paperwork was a hassle.
- The other Comfort Home and ENERGY STAR® Homes installer worked with Aspire Homes, Richie Homes, Fogarty Investments, John Luciano, and Leete Homes, installing HVAC systems in 100 homes. This contractor had installed approximately 300 systems prior to 1999, and said 90% of its 1999 tract home installations were in Comfort Homes. This contractor mentioned the testing as a key difference between his approach in program versus non-program homes, although he described the testing as "hard to deal with." However, this contractor did credit the program with motivating him to do duct sealing on all homes, which he would continue to do without the program. This same contractor installed HVAC systems in 50 ENERGY STAR® Homes.
- The contractor who reported participation in the SDG&E ComfortWise program actually had done no installations at the time of the interview ("all starting soon"), though the projects were with Continental Homes and Shea Homes. This contractor had not installed in program homes before, and anticipated that dealing with interactive effects with windows would be a key difference in program installations versus in non-program installations.

HVAC contractors were asked how often builders (outside of utility programs) actively solicit their input on helping them meet Title 24 code, on a scale of always (5), often (4), sometimes (3), rarely (2), or never (1). Five of the contractors said always, five said often, one said sometimes, two said rarely, and two said never, yielding a mean rating of 3.6.

- Among those who said this happened at least sometimes, a subset indicated that changes in their HVAC system design, equipment, installation, or testing were typically involved. These generally included the interactive measures (ducts, windows, and insulation) mentioned earlier, and some of the procedures and resources mentioned at the start of this section, with none predominating.
- HVAC contractors then were asked how often builders (outside of utility programs) actively solicit their input on helping them exceed Title 24 code, on the same scale. In this case, eight contractors said rarely, six said never, and only one said sometimes, yielding a mean rating of 1.7. This is consistent with market actor input discussed elsewhere in this report, where builders are perceived as much less interested in exceeding code than in just meeting it.

Six of the 15 HVAC contractors reported awareness of utility-sponsored training on high-efficiency HVAC or duct system design, equipment, installation, or testing. Three of those six had attended training sessions of this type in 1999.

- One contractor in PG&E's service territory had attended two PG&E training sessions on energy efficiency in 1999, and would like to see additional training on duct design and installation.
- One contractor in the SCE/SoCalGas service territory had attended three training sessions in 1999, between SoCalGas and Carrier. The focus of these sessions was on duct testing and installation, resulting in significant improvement in this area. This contractor would like to see additional training on equipment selection and sizing.
- A third contractor, also in the SCE/SoCalGas service territory, attended a ComfortWise training session in 1999 focusing on Title 24 standards, tight ducts, and duct design. This contractor would like to see similar training sessions targeted to builders so they better understand the benefits and elements themselves.

All but one of the contractors interviewed had had this kind of training, at some point in the past. Three reported past PG&E training, two reported past SoCalGas training, one reported past SCE training, and four reported past training from manufacturers, suppliers, or distributors (including Carrier, Lennox, Trane, York, American Standard, and Coleman).

In terms of *sustainability*, HVAC contractors (program participants and nonparticipants) were asked to rate their likelihood of participating in the RNC program next year, based on their current understanding of the program. Because familiarity with program requirements was typically very low, responses are reported here only for the two Comfort Home and one SDG&E ComfortWise participants.

- One Comfort Home installer was extremely likely to continue participating, because builders request it (in turn because buyers are perceived to want energy-efficient homes). This contractor credited the program with increasing his focus on duct sealing on all homes, and would continue this focus even without the program.
- The other Comfort Home builder was only somewhat likely to continue participating, but did not provide a definitive reason for that response. While this contractor reported increased understanding of testing and duct tightness, he was uncertain about whether he would continue these practices in the absence of the program.
- The SDG&E ComfortWise installer, as noted earlier, had not yet installed any systems in program homes, but expected to do so soon. This contractor was extremely likely to continue participating, and said that "this is the type of work" he wanted to pursue.

A.6 REALTORS/SALES AGENTS

Fifteen realtors (also development sales agents) were interviewed, six in PG&E's service territory, seven in SCE/SoCalGas service territory, and two in SDG&E service territory. One realtor each in the PG&E and SCE/SoCalGas service territories were directly linked to program builders (the latter to a SoCalGas EAH program builder).

A.6.1 Realtor/Sales Agent Awareness/Knowledge

Realtor top-of-mind awareness of RNC programs was low, though their prompted awareness was somewhat higher (see Exhibit A-21). Six of the 15 realtors were familiar with EEMs as described in the interview (4 said they were available in their area, but no buyers had used them). Only 1 of the 15 realtors was aware of utility-sponsored training on energy efficiency in their area in 1999 (but that 1 realtor had not attended any training sessions).

Exhibit A-21
Realtor/Sales Agent Contractor Program Awareness

Energy Efficient Feature	Number of Realtors/Sales Agents Aware
Unaided Awareness	
EAH	1
Aided Awareness	
PG&E Comfort Home	4
SCE ComfortWise	1
EAH	3
SDG&E ComfortWise	1
ENERGY STAR® Homes Program	2

A.6.2 Realtor/Sales Agent Perceptions/Evaluation and Intent

Realtors see moderate buyer demand for energy efficiency, but somewhat less willingness to pay on the part of buyers. Perhaps because realtors expect buyers to have a fairly high association between home quality and comfort and energy savings, they also say most buyers expect new homes to have energy-saving features as a matter of course.

To gauge top-of-mind value of energy efficiency to homebuyers (as perceived by realtors), the realtors were asked what new tract home features buyers most often asked for. The realtor linked to the SoCalGas EAH program (who said all of the program homes exceeded $500,000 in value) said that buyers expect dual-pane, glazed windows (along with a number of other features not directly relevant to energy use). Two other realtors mentioned energy efficiency in a general way, as part of a list of buyer requests, but said that energy efficiency did not predominate.

Realtors rated the degree of perceived buyer demand for tract home energy efficiency on a scale of a lot (5), some (4), little (3), very little (2), or none (1). On that basis, the mean was 3.3, centering between the "little" and "some" responses. Realtors most often perceived buyers looking for double/triple-pane windows (4), water heaters (4), appliances (4), HVAC (3), windows (3), and insulation (3), in terms of energy-saving features.

Realtors also rated buyer willingness to pay for energy-saving features, using a scale of extremely (5), very (4), somewhat (3), not very (2), or not at all (1) willing to pay for the additional costs. On that basis, the mean was 2.6, between the "not very willing" and "somewhat willing" categories.

Nine of the 15 realtors perceived an increase in buyer demand for energy-saving features over the last 5 years, while three saw no change, one saw a decrease (because of the "seller's market" in California), and two were unsure. Factors driving the perceived increase covered a wide range, and included buyer desire for value, utility advertising and promotion, greater awareness, comfort, increased home size, gas appliances, and increased chance of loan approval.

Most (12) of the realtors say that buyers expect all newer homes (built in the last 5 years) to be built to save energy. Five of the 15 realtors reported that buyers had asked about homes that exceed state code (Title 24), with estimates ranging from 5% to 75% of the buyers encountered in the last year or so.

Realtors rated how closely buyers associate energy saving features with home quality, on a scale of 1 to 5, where 5 is very strongly and 1 is not at all. On that basis, the mean rating was 3.9. On the same scale, realtors rated buyer associations of energy saving features with comfort; on that basis the mean was 3.8.

Exhibit A-22 below summarizes realtors' mean ratings on 10 subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important. These barriers relate to realtors' ability to sell more homes that exceed state code. Realtors' barrier ratings were lower overall relative to those of other market actors, though increased cost rose to the top of the list (as was typically the case with others). At the same time, realtors did not identify any other barriers, although one commented that there was no buyer demand (which is why his ratings were low), and another suggested that a simple, bullet-point sheet with savings information for specific energy-saving products would help stimulate demand. Probing realtor knowledge of Title 24 was judged outside the scope of the interview, but it is possible that low ratings stem from their lack of knowledge of energy codes and how often or rarely their home sales exceed code.

Exhibit A-22
Summary of Realtors' Subjective Market Barrier Ratings

Realtors' Subjective Market Barriers	*Mean*
Increased home cost	2.3
Lack of buyer willingness to pay	1.9
Realtor performance uncertainty	1.9
Information / search costs (not enough sales agent support in terms of training and promotional materials)	1.9
Buyer access to financing	1.6
Focus too narrow (not enough EE options)	1.5
Organizational practices (builders)	1.5
Organizational practices (realtors)	1.4
Transaction / hassle cost	1.5
Buyer performance uncertainty	1.4

The primary measure of realtor *intention* related to whether they felt the proportion of their new tract home sales that exceed code would increase, decrease, or stay the same. (As noted with some other market actors, this addresses realtor expectations regarding broader market trends, of which their own intentions are only a subset.) Nine of the 15 realtors expected an increase, while five expected no change and one was unsure. Most realtors did not expect any changes in the next 2-3 years in how they will address energy efficiency issues in selling new tract homes, though several mentioned learning more about energy efficiency, learning more about new products, and more proactively promoting energy efficiency.

A.6.3 Realtor/Sales Agent Actions and Sustainability

Realtors rated the frequency with which they promote energy efficiency to potential buyers of new tract homes, on a scale of always (5), often (4), sometimes (3), rarely (2), or never (1). On that basis, eight of the 15 realtors said they always promote energy efficiency, one said often, four said sometimes, and two said never, yielding a mean rating of 3.9.

Realtors then used the same scale to describe how often they (1) have access to, (2) tell buyers about, and (3) have the buyer ask about specific aspects of the home's energy-using features. Mean ratings are summarized in the table below. As illustrated in Exhibit A-23, these data indicate that realtors have greater access to building shell information than HVAC system information, and have the least information on ductwork. The data imply that they "sometimes" provide this information to buyers proactively, though buyers ask about these items less often.

Exhibit A-23
Purchase Discussion Focus on Energy Efficiency Features

Energy-Related Home Dimension	*Have Access?*	*Tell Buyer?*	*Buyer Asks?*
Energy-saving features like double-paned windows and insulation	4.1	3.6	3.1
Efficiency rating of the HVAC system	3.4	2.9	2.6
Efficiency rating of the heating system	3.4	2.9	2.6
Techniques used to install HVAC ductwork	2.3	1.9	1.6

Of the 15 realtors, two had sold homes through the PG&E Comfort Home program, and two had sold SoCalGas EAH program homes.

- The two EAH realtors did not report major changes in how they sell tract homes in general as a result of their program experience, though one appreciated the promotional materials, and the other indicated he may emphasize energy efficiency more than in the past. Regarding sustainability, both plan to keep using those changes in practice and resources (perhaps the ideas in the promotional materials) in the future even if the program were discontinued.
- One of the two Comfort Home realtors indicated they discuss energy efficiency more than they did 10 years ago, as a change brought about by the program (presumably over multiple program years). The other Comfort Home realtor passed along PG&E's promotional materials (brochures and coupons) to buyers. Regarding sustainability, both indicated they would keep using those changes in practice and resources in the future even if the program was discontinued.

Although two of the 15 realtors had heard of the ENERGY STAR® Homes Program, none had sold homes that were part of the program.

As noted earlier, none of the 15 realtors had dealt with EEMs or attended utility-provided energy efficiency training sessions in 1999.

A.7 APPRAISERS

Eight appraisers were interviewed, three each in PG&E and SCE/SoCalGas service territories, and two in SDG&E service territory.

A.7.1 Appraiser Awareness/Knowledge

Appraisers claim to capture information about home energy use and efficiency, but this knowledge does not appear to be linked to specific action, such as justification of EEMs or as initial filters for CHEERS evaluations. They do not appear to have been reached by RNC program information or outreach activities (i.e., training).

None of the eight appraisers were aware of the utility RNC programs or the ENERGY STAR® Homes Program, though one did mention CHEERS when unaided program awareness was asked. Only one appraiser in SDG&E's service territory reported aided RNC program awareness. None of the eight was aware of the ENERGY STAR® Homes Program on an aided basis.

One appraiser in PG&E's service territory reported awareness of EEMs as described to them in the survey. This appraiser reported that lenders never talk or ask about EEMs, and that homeowners and homebuyers rarely do. This appraiser (who reported 1800 home appraisals in 1999), also was the one who had mentioned CHEERS when asked about utility-provided energy efficiency programs, and also was the only one to name a "ratings system that certifies the energy efficiency of individual homes" when asked (again mentioning CHEERS).

One appraiser in SDG&E's service territory reported awareness of energy efficiency training provided for home appraisers in 1999, but had not attended any training sessions. This appraiser also was the only one of the eight who reported having read or heard information indicating that energy-efficient homes sell at a premium to comparable homes without energy-efficient features. (This appraiser, reporting 1,200 appraisals in 1999, also was the one who indicated aided awareness of the SDG&E ComfortWise program, above.)

Exhibit A-24
Home Energy Usage and Energy Efficiency

Energy Efficient Home Features Mentioned in Appraisals	Number of Appraisers
Insulation R-levels	7
Windows	5
Solar Features	5
HVAC SEER Level	3
Furnace/Heating AFUE Levels	2
Overall Home Energy Efficiency Levels	1

A.7.2 Appraiser Perceptions/Evaluations and Intent

Appraisers emerged as oriented to staying with the tried-and-true, and not wishing to stand apart from the crowd in their appraisal processes. External validation from utility and government energy efficiency certifications, independent appraisal journals, other appraisers, and trends in actual home sales prices is, not surprisingly, what appraisers want, to feel comfortable making changes in their appraisal processes.

- Similar to builders, who expressed a "show me the demand and I'll build to it" philosophy about energy efficiency, appraisers seem willing to build energy efficiency into their appraisal processes and valuations, given evidence and certification that justifies those changes. Also, their criteria for this justification (typically 5-10 homes within a 6-month period sold at a premium because of energy efficiency) were not highly stringent.
- The primary "how-to" barrier that exists is the lack of standardized practices or software tools for capitalizing the value of energy efficiency-based home operating savings.

Regarding their perceptions / evaluations, appraisers first were asked how important each of 7 factors would be in influencing how they appraise homes (not necessarily the appraisal values themselves). Appraisers provided ratings on a scale from 1 to 5, where 5 meant the factor was extremely important and 1 meant it was not at all important. Mean ratings for these factors are presented in Exhibit A-25.

Exhibit A-25
Factors Influencing Home Appraisal Process

Factor	Mean Rating
Changes in selling prices of comparable homes	4.5
Information in professional appraisal journals about new / different methods	3.7
Changes in the home sales turnover rate	3.4
Changes in borrower interest rates	3.1
Changes / differences in insurance loss rates associated with characteristics	2.0
Changes in tax assessment values or rates	1.8
Changes / differences in home operating costs	1.5

Appraisers rated energy efficiency in terms of its importance in their overall home appraisal, on a 5-point scale of extremely (5), very (4), somewhat (3), not very (2), or not at all (1) important. On that basis, two appraisers said energy efficiency is very important in their home appraisals, three said it was somewhat important, and three said it was not very important, yielding a mean rating of 2.9. Follow-up questions probing what real difference this energy efficiency made in the ultimate appraisal suggested that this mean rating may be an overstatement. Only one appraiser (in SDG&E's service territory) provided meaningful input in this regard, mentioning triple-pane versus single-pane windows as a distinction, although without any specific input on what difference this might make in dollar terms.

Exhibit A-26 summarizes appraisers' mean ratings on eight subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important.[10] These responses indicate that appraisers perceive market uncertainty and lack of appropriate sanction as the primary barriers to placing more emphasis on energy efficiency. As with other supply-side actors in the RNC market, the "why to" barriers tend to rise to the top, with "how to" barriers in a distinct second tier.

Exhibit A-26
Summary of Appraisers' Subjective Market Barrier Ratings

Appraisers' Subjective Market Barriers	Mean
Lack of evidence that buyers value EE (market uncertainty)	4.5
Lack of a certified energy efficiency rating from the utility or government	4.2
Lack of evidence that lenders value energy efficiency	4.2
Lack of a standard practice/software tool for factoring ongoing operating costs into home appraisal value (product unavailability)	3.4
Appraiser performance uncertainty	3.2
Information/search costs	3.2
Transaction/hassle costs	2.0
Organizational practices	1.6

In terms of appraiser intentions, in Section A.7.1 above it was reported that only one of the eight appraisers had read or heard information asserting that energy-efficient homes command a market premium. Appraisers also were asked to consider a scenario where they read or heard "convincing evidence" that energy-efficient homes could command a modest premium. They then rated the importance of this information in the way they appraise these homes, on a 5-point scale, where 5 meant it would have a significant effect, and 1 meant it would have no effect on their appraisal process. Six appraisers provided ratings (two were unsure), with a resulting mean of 2.8. Appraisers who gave more positive reasons generally provided no insights into why they responded that way (implying that learning that kind of information as described in the scenario would be more-or-less sufficient to convince them). Conversely, the reasoning behind more skeptical ratings varied, as follows:

- One appraiser in the SDG&E's service territory indicated he wouldn't necessarily be convinced because of the moderate coastal San Diego climate that he serves.
- Another appraiser indicated that in such a hot home sales market, energy efficiency was not important to homebuyers.
- A third appraiser indicated that this kind of consideration would complicate the appraisal process, making it more difficult to find comparables (the implication was that this was undesirable).

[10] Note that in most cases only five appraisers were able to provide ratings (the rest were unsure).

Following the same line of questions, appraisers were asked how many homes they would need to see sold at a modest premium, because of energy-efficient features, before they would seriously consider factoring energy efficiency into the appraisal process for similar homes. A follow-up question asked them how long they would need to see this trend continue before seriously considering energy efficiency in their appraisals.

- Of the five appraisers who responded, all but one said 10 or fewer homes (the outlier said 100), and all indicated a trend of 6 months or less would be sufficient.
- One appraiser made the follow-up comment that conversations with other NAREA members would be important in changing appraisal procedures, while another mentioned lender / underwriter buy-in also would be important.

This suggests potential for a utility or third-party RNC initiative to create a demonstrate pilot on a manageable scale, designed to makes the case (if possible) that a modest premium is possible for more efficient homes, relative to comparable homes.

A.7.3 Appraiser Actions and Sustainability

Appraisers appear oriented to actively monitoring the conditions that affect both appraisal values and appraisal procedures, and use well-established software tools and information sources to accomplish this. As seen in preceding sections, they are enabling market actors but not key drivers of change, which tends to trickle down to their level from other more influential market actors and forces.

Appraisers were asked a question early in the survey about how they develop appraisal values for residential properties. Their responses typically revolved around market comparables of similar, nearby homes; broader market data in terms of how values may vary by location; and home and property condition. Additional factors that come into play include features like swimming pools, oversize lots, location within neighborhood, and remodeling or other particular home amenities.

Appraisers were asked what software or worksheets (if any) they use to systematically adjust home values based on specific home features. All but one uses this kind of software; the exception was a large appraiser in PG&E who uses "research and experience" instead. One appraiser mentioned using several programs, and indicated lenders sometimes dictate which software is used. The specific programs mentioned by appraisers included A La Mode (three mentions), MCS (two mentions), Win Total 2000, Day One, ACI, and Appraisers Choice (the latter two may denote the same software tool).

All but two appraisers said they review overall home appraisal policies and procedures on an ongoing basis, as market conditions dictate. One of the remaining two appraisers said they did so quarterly, while the other could not say how often they reviewed appraisal policies and procedures. When probed about how the last significant change in appraisal procedures came about, appraisers mentioned sources and influences like:

- The OREA (Office of Real Estate Appraisals; several mentions)
- New regulations and licensing requirements (several mentions)
- Bank / client need (several mentions)

- FNMA / Fannie Mae (two mentions)
- HUD (two mentions),
- Freddie Mac
- The Appraisal Institute and its USPAP guidelines
- A U.S. Congress action some years ago

All but one appraiser said they read publications like *The Appraisal Journal* or *The Real Estate Appraiser & Analyst* on a regular basis; one said he reviewed those "sometimes."

A.8 LENDERS

Fifteen mortgage lenders were interviewed in total, six in PG&E service territory, five in SDG&E service territory, and four in SCE/SoCalGas service territory.

A.8.1 Lender Awareness/Knowledge

Lenders reported market shifts toward more efficient tract homes, and associated those shifts more with builders than with utility programs or influences. A subset of lenders was aware of EEMs and a subset capture energy usage data in their home appraisals, but energy efficiency generally is not considered in the loan approval process, and only a minority either offer EEMs or plan to. As one lender put it, "we approve the person, not the home," and EEMs (at least as currently structured and perceived) do not appear to have broad appeal to lenders, because they are not seen as differentiated or necessary to meet market demand.

Of the 15 lenders interviewed, six reported noticing an increase in the construction and marketing of more energy-efficient tract homes in the last year or two.

- Factors behind the increase included perceived greater buyer demand for efficiency; tougher building codes; and more efficient appliances, windows, and water heaters.
- Builders associated with these more efficient tract homes included Shea, Beazer, Aspire, Castle Components, and Kirack.
- A lender in PG&E's service territory reported that Castle Components had a housing tract where they are the preferred lender, and the efficient features in those homes include glazed windows/doors, water heaters, furnace, weather stripping, and insulated exterior walls and attic.
- Two of the six reporting an increase in efficient tract home sales (both in PG&E's service territory) reported changes in lending practices as a result of their exposure to these more efficient tract homes. One said they add up to 2% more on ratios. Another said they use the efficiency information as a "compensating factor," but did not provide any specifics on how that is effected, other than implying it can be a tiebreaker in approving a loan that is on the border of qualifying or not.

Only one of the 15 lenders recalled any energy efficiency training or information provided to lenders by their utility in 1999. This lender, in PG&E service territory, recalled a videotape made for homebuyers/owners (presumably by PG&E) that was shown to lenders in support of EEMs. Although this lender did not recall the Comfort Home Program, he indicated that EEMs would be "offered soon." Lender RNC program awareness is summarized in Exhibit A-27.

Exhibit A-27
Lender Program Awareness

Energy Efficient Feature	Number of Lenders Aware
Unaided Awareness	
PG&E Comfort Home	1
PG&E (not any specific program)	3
SDG&E Water Heater Rebate Program	1
City Appliance Rebates	1
Green Mountain Power	1
Aided Awareness	
SDG&E ComfortWise	1
ENERGY STAR® Homes Program	1

Eight of the 15 lenders reported that their home appraisals were designed to capture information about the home's energy efficiency or energy usage characteristics.

- When asked what percentage of their appraisals actually contained this kind of information, responses ranged from 0% or 5% to 80% or 100%, with no obvious clustering of responses.
- The energy-related home features most often included in appraisals were insulation R-levels (five), HVAC SEER levels (four), furnace AFUE levels (four), window efficiency ratings (three), solar heating (two), degree/percent exceed Title 24 (one), and overall home energy efficiency rating (one).

Five of the 15 lenders were aware of EEMs as described to them, and two of those five offered them. One offered easier qualifications and flexible qualifying ratios, and the other offered a higher loan-to-value ratio. No secondary market demand for EEMs was reported, though one of the lenders not using EEMs said that would be a factor in their considering a policy change. Lenders generally expected negligible, or no, impact on their business if EEMs were available and used.

- Advantages to EEMs included "being able to qualify more borrowers" and "just another sales tool," with one of the lenders mentioning the process involved "too much paperwork" and that they try to stay away from the process as much as possible.
- Among the three lenders aware of EEMs but not offering them, one said they would be offering EEMs soon, one said they use an automated underwriting system (FNMA's "Desktop Underwriter") that addresses conventional loans (not government loans), and does not incorporate energy efficiency, and one said they were a niche, sub-prime lender.

Only one lender in PG&E service territory reported awareness of an energy efficiency certification for new tract homes, and that lender mentioned the Comfort Home program itself (not CHEERS or HERS).

A.8.2 Lender Perceptions/Evaluation and Intent

Lenders perceive fairly high consumer demand for energy efficiency in tract homes, but do not consider that demand (or energy efficiency features themselves) very relevant to the task of approving tract home loans. This is because lenders do not understand the cash flow implications of energy-efficient homes, therefore do not see evidence that cash flow savings are capitalized in the value of efficient tract homes, and therefore generally do not factor energy efficiency into the approval process (with isolated exceptions if buyers are on the border of qualifying).

Lenders were asked to rate the degree to which their lending policies generally associate energy-saving equipment installed in a home with home quality. On a 10-point scale where 10 was an extremely high association and 1 was no association at all, most lenders provided ratings of 1 or 2, with one 3 rating, one 5 rating, and one 8 rating. The last rating was from the lender in PG&E's service territory who also provides EEMS to allow for ratio flexibility, and he indicated that if builders are "PG&E certified" (that is, program builders) then they are conscientious and aware of improving home marketability. The mean rating was 2.1, with most lenders saying energy efficiency simply doesn't factor into the loan approval process, with a few comments to the effect that the borrower is being evaluated, not the home.

Lenders rated the degree of perceived buyer demand for tract home energy efficiency on a scale of a lot (5), some (4), little (3), very little (2), or none (1). On that basis, the mean was 3.9, centering on the "some" response. Lenders generally were unable to articulate any suggestions for boosting consumer demand for energy efficiency.

Of the eight lenders whose appraisals capture energy efficiency information, five said they place no importance on this information relative to more traditional criteria (PITI, credit history), and the other three said they place much less importance on it, with one lender commenting that the home value is much more important than its energy efficiency.

Lenders were asked to rate how useful a utility-approved certification of a new tract home's energy efficiency would be in considering energy efficiency in the loan approval process. On a scale of extremely (5), very (4), somewhat (3), not very (2), or not at all (1) useful, eight of the lenders said this certification would not be at all useful, and the mean was a low 1.9. Again, the general theme was that lenders don't typically consider energy efficiency criteria to begin with, and some lenders use software or procedures that exclude energy efficiency information. The one lender aware of the ENERGY STAR® Homes Program said an ENERGY STAR®-approved certification would not be at all useful.

Lenders were read a scenario in which a borrower applies for a mortgage corresponding to $1500 monthly PITI, on a new tract home, and is on the borderline for qualification. The home is certified by the local utility to be 30% more efficient than comparable homes. Given that scenario, lenders were asked what minimum amount of monthly energy bill savings it would take for them to approve the loan. While most said it was not applicable (because this

would not sway their decision), other responses included 5% or $50, $100, $100 to $150, $200, and a 2% increase in the debt ratio.[11]

Exhibit A-28 summarizes lenders' mean ratings on 11 subjective barrier statements rated on a 5-point scale, where 5 is extremely important and 1 is not at all important. These pertained to perceived barriers to lenders' providing (more) EEMs than they do now. Consistent with other lender input, the highest barriers to expanded EEM offering and use were insufficient market demand and business need for them, and insufficient evidence that energy efficiency matters in evaluating a home or loan. Lenders saw their own organizational practices as the least important of the 11 barriers measured.

Exhibit A-28
Summary of Lenders' Subjective Market Barrier Ratings

Lenders' Subjective Market Barriers	Mean
Sufficient market demand without needing this kind of loan	3.8
Lack of information from independent appraisers on the value of energy efficiency	3.5
Lack of buyer willingness to pay	3.4
This kind of loan isn't very different from others available	3.3
Transaction / hassle cost (associated with reviewing and processing EEM applications)	3.3
Cost and hassle involved in marketing a new product	3.2
Lender performance uncertainty	3.1
Lack of a certified energy efficiency rating from the utility or government	3.0
Lack of a secondary market for EEMs	3.0
Information / search costs (lack of information on how to evaluate specific home features in terms of cash flow savings)	2.7
Organizational practices	2.3

In terms of lender intentions, as discussed earlier, most lenders do not offer EEMs and do not plan to, for the very reasons highlighted in the table above.

A.8.3 Lender Actions and Sustainability

Lenders have had limited exposure to EEMs, and have received no pressure to offer EEMs from borrowers or secondary markets. Two of the 15 lenders interviewed had offered EEMs, one on a limited basis; a third lender plans to begin offering EEMs soon.

[11] Although some of the preceding responses appear extreme on the basis of monthly savings, that was the context of the question, and no single respondent estimate appears starkly different from all of the others. It appears that lenders would need to see much greater monthly savings than are realistic, in order to sway their approval decision.

Seven of the 15 lenders report that residential mortgage lending policies are reviewed on an ongoing basis, while two said policies are reviewed once a quarter, two said more than once a year, two said annually, and two were uncertain about how often mortgage lending policies were reviewed. Nine of the lenders reported that 10% or less of their 1999 residential mortgage loans were for new SFD tract homes (underscoring the relative unimportance of tract home energy efficiency to them), although one lender said that segment comprised 60% of the business, and another said it comprised 64% of the business (the latter had written mortgages for 80 Comfort Homes).

As reported in Section A.8.1, one lender reported writing mortgages on 80 Comfort Homes in 1999. Two percent of added flexibility in the debt ratio was added in the review and approval of these program home mortgages. A different lender reported having received a videotape about the benefits of energy efficiency, and is planning to begin offering EEMs soon. Two other lenders already offer EEMs.

B. PRIMARY RESEARCH SURVEYS AND INTERVIEWS

RNC Program Staff Interviews

In-depth interviews were held with key RNC program staff, including key outsource staff for the SCE and SDG&E ComfortWise program interventions. The interviews were conducted in late September and early October, 1999, and included:

- Cece Barros, PG&E
- Julieann Summerford and Judy Kelly, SDG&E
- Michele Thomas and Lisa Brewer, SCE
- Gerry Foote, SoCalGas
- Mike Hodgson, Consol (ComfortWise outsource provider)

Interviews focused on program history, PY99 program structure and process, anticipated PY2000 program changes, key market actors and barriers, progress indicators being tracked (including then-current status on indicators where available), and links and comparisons to other California RNC programs.

STATEWIDE RESIDENTIAL NEW CONSTRUCTION (RNC)
NON-PARTICIPANT HOMEBUYER SURVEY
FINAL

SC001. Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting, an energy market research firm based in California. Today / tonight we're conducting an important, 10 to 12 minute survey on the use of energy-related products in new homes. I'd like to speak with the person in your household most involved in selecting your current home.

[IF NEEDED:] This is a fact-finding survey only – we are NOT interested in selling anything, and responses will not be connected with your household, or you personally, in any way.

[IF ASKED "HOW DID YOU GET MY NAME?" / "HOW DID YOU KNOW MY HOUSE WAS NEW?":] We just have a list of people who have recently bought homes, based on various kind of public information.

[IF ASKED WHO IS SPONSORING IT:] I'm not allowed to mention the sponsor at this point, to avoid biasing your responses, but I'll be glad to identify the sponsor at the end of the survey.

1	Current individual is best HH contact	SC002
2	Transferred to best HH contact	SC002
3	Best contact not available – set up callback	Record for future contact
99	Don't know / refused	Thank & terminate

[WHEN CORRECT RESPONDENT IS ON-LINE (REPEAT AS NEEDED TO REACH AND INFORM BEST CONTACT):]
SC002. Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting, an energy market research firm based in California. I understand you're the person most involved in selecting your new home. We're conducting an important study on the use of energy-related products in new homes. It should take no more than 10 or 12 minutes, and it's an important opportunity to make sure your views are heard.

[IF NEEDED:] This is a fact-finding survey only – we are NOT interested in selling anything, and responses will not be connected with your household, or you personally, in any way.

1	Current individual is best HH contact	SC003
2	Transferred to best HH contact	Repeat SC002 w / best contact
3	Best contact not available – set up callback	Record for future contact
99	Don't know / refused	Thank & terminate

SCREENING QUESTIONS

SC003. First, do you own or rent your home? [MEANS AT THIS ADDRESS / DWELLING]

1	Own	SC004
2	Rent / lease	Thank & terminate
99	Don't know / refused	Thank & terminate

SC004. Did you first occupy this home since January 1st, 1999, or before 1999?

1	Since January 1st (during 1999)	SC005

2	Before 1999	Thank & terminate
99	Don't know / refused	Thank & terminate

SC005. Was this home new when you bought it, or had someone else owned it before?

1	New when bought it	SC006
2	Someone owned before (previously owned)	Thank & terminate
3	BUILT home - volunteered	SC006
99	Don't know / refused	Thank & terminate

[IF RESPONDENT VOLUNTEERS THAT S/HE BUILT THE HOME – HAD A SUBSTANTIAL ROLE IN OVERSEEING DESIGN AND CONSTRUCTION – USE ALTERNATE [ ] TEXT IN LATER QUESTIONS AS PROVIDED.]

SC006. Is this your primary residence, or a secondary residence where you live just part of the year?

1	Primary residence	SC007
2	Secondary / seasonal residence	Thank & terminate
99	Don't know / refused	Thank & terminate

[SC007 SHOULD JUST CONFIRM SFD STATUS BASED ON SAMPLE DATA.]
SC007. Just to check, is your home a single-family, detached house? [IF NO, PROBE FOR CORRECT DWELLING TYPE.]

1	YES, single-family house (SFD)	RN014
2	No, condominium	Thank & terminate
3	No, townhome	Thank & terminate
4	No, mobile / manufactured home	Thank & terminate
5	No, apartment	Thank & terminate
88	No, other [SPECIFY:]_____	Thank & terminate
99	Don't know / refused	Thank & terminate

[QUESTIONS 8-13 SKIPPED ON PURPOSE.]

AWARENESS OF/INVOLVEMENT WITH RNC PROGRAM ELEMENTS

RN014. As I mentioned earlier, this survey is about your home's energy usage. On a scale from 1 to 10, where 1 is not at all important and 10 is extremely important, how important was energy efficiency to you in the selection of this home?

#	1-10	RN015
99	Don't know / refused	RN015

RN015. Some government agencies and utilities sponsor programs designed to encourage the installation of energy-efficient features in new homes. Have you heard of any government-sponsored or utility-sponsored programs like these?

1	Yes, aware of government- or utility-sponsored programs	RN016
2	No, not aware of programs	RN017
99	Don't know / refused	RN017

RN016. What program names can you recall, if any? [DO NOT READ]

1 *	Comfort Home	RN017
2 *	ComfortWise	RN017
3 *	Energy Advantage	RN017
4 *	Energy Star / Energy Star Homes Program	RN017
5	PG&E – other / unspecified program	RN017
6	SCE / Southern California Edison – other / unspecified program	RN017
7	SoCalGas – other / unspecified program	RN017
8	SDG&E – other / unspecified program	RN017
9	EPA / DOE / US Gov't - other / unspecified program	RN017
88	Other [SPECIFY:] _____	RN017
99	None / don't know / refused	RN017

[ASK RN017 FOR EACH "*" PROGRAM NOT MENTIONED AT RN016.]
RN017. Have you heard of the [PROGRAM] as one that encourages installation of energy-efficient features in new homes? [READ LIST, RECORD ALL "YES" RESPONSES.]

1 *	Comfort Home program	RN018
2 *	ComfortWise program	RN018
3 *	Energy Advantage program	RN018
4 *	Energy Star Homes Program	RN018
99	[DO NOT READ:] None / refused	RN018

[ASK RN018 FOR EACH "*" RNC PROGRAM MENTIONED AT RN016 OR RN017.]
RN018. Were you familiar with the [PROGRAM] program at the time you were buying [building] your home?

1	Yes, aware at time of purchase	RN019
2	No, not aware at time of purchase	RN019
99	None / Don't know / refused	RN019

[ASK RN019 FOR EACH RNC PROGRAM MENTIONED AT RN016 OR RN017.]
RN019. How did you find out about the [PROGRAM] program? [DO NOT READ; RECORD ALL RESPONSES BASED ON BEST CLASSIFICATION BELOW.]

1	Advertising (media / general) – PG&E	RN020
2	Advertising (media / general) – SCE / Edison	RN020
3	Advertising (media / general) – SoCalGas	RN020
4	Advertising (media / general) – SDG&E	RN020
5	Advertising (media / general) – EPA / DOE / US Government	RN020
6	Advertising (media / general) – Other / unspecified	RN020
7	Direct mail / marketing – PG&E	RN020
8	Direct mail / marketing – SCE / Edison	RN020
9	Direct mail / marketing – SoCalGas	RN020
10	Direct mail / marketing – SDG&E	RN020
11	Direct mail / marketing – EPA / DOE / US Government	RN020
12	Direct mail / marketing – Other / unspecified	RN020
13	Web site – PG&E (SmarterEnergy)	RN020
14	Web site – SCE / Edison	RN020
15	Web site – SoCalGas	RN020
16	Web site – SDG&E	RN020

17	Web site – EPA / DOE / US Government	RN020
18	Web site – Other / unspecified	RN020
19	Visited program development	RN020
20	Toured model home (non-specific)	RN020
21	Toured Energy Star Homes Program model home	RN020
22	Builder / development sales agent told me about it	RN020
23	Realtor told me about it	RN020
24	Other personal contact told me about it (i.e., not related to home sales ind	RN020
25	Home show	RN020
88	Other [SPECIFY:] _____	RN020
99	[DO NOT READ:] None / Don't know / refused	RN020

RN020. As far as you know, was your home built under (this / these) program(s)? [RECORD MULTIPLE RESPONSES - IF IN SCE / SoCalGas SERVICE TERRITORY, DISTINGUISH BETWEEN COMFORTWISE AND ENERGY ADVANTAGE; IF IN PG&E SERVICE TERRITORY, DISTINGUISH BETWEEN COMFORT HOMES AND ENERGY STAR.] [CATI – DISPLAY "*" OPTIONS MENTIONED AT RN016 OR RN017.]

1	Yes, Comfort Home	RN021
2	Yes, ComfortWise	RN021
3	Yes, Energy Advantage	RN021
4	Yes, Energy Star	RN021
5	No, home not built under any programs	RN022
99	None / don't know / refused	RN022

RN021. How important was this program sponsorship to your decision to purchase [build] this home? Please give me a 1 to 10 rating, where 1 is <u>not at all important</u>, and 10 is <u>extremely important.</u>

#	1-10	RN022
99	Don't know / refused	RN022

<u>SEARCH/COMMUNICATIONS FACTORS</u>

RN022. Thinking back to when you were shopping for [building] your new home, how actively did you investigate the energy efficiency of that home, and others you may have looked at? Please give me a 1 to 10 rating, where 1 means you were <u>not at all active</u> in investigating energy efficiency, and 10 means you were <u>extremely active</u> in investigating energy efficiency.

#	6-10	RN023
#	1-5	RN024
99	Don't know / refused	RN024

RN023. What contacts or information sources did you use to investigate energy efficiency in new homes, when you were shopping for [building] your home? [DO NOT READ]

1	Comfort Home program brochures / model homes	RN024
2	ComfortWise program brochures / model homes	RN024
3	Energy Advantage program brochures / model homes	RN024
4	Energy Star program brochures / model homes	RN024
5	PG&E (other / miscellaneous)	RN024

6	SCE / Southern California Edison (other / miscellaneous)	RN024
7	SoCalGas (other / miscellaneous)	RN024
8	SDG&E (other / miscellaneous)	RN024
9	EPA / DOE / Other U.S. government source (other / miscellaneous)	RN024
10	Architect / designer(s)	RN024
11	Builder(s) / builder or development sales agents	RN024
12	Home inspector (buyer's inspector)	RN024
13	Lenders	RN024
14	Newspapers / magazines (general)	RN024
15	Realtors	RN024
16	"Consumer Reports" magazine	RN024
17	Other personal contact (i.e., not related to home sales industry)	RN024
18	PG&E program brochures / model homes	RN024
19	SCE / Southern California Edison program brochures / model homes	RN024
20	SoCalGas program brochures / model homes	RN024
21	SDG&E program brochures / model homes	RN024
22	Program brochures / model homes – non-specific	RN024
23	Home show	RN024
88	Other [SPECIFY:] _____	RN024
99	None / don't know / refused	RN024

RN024. Were there any contacts or information sources that actively emphasized the topic of energy efficiency when you were shopping for [building] your home?

1	Yes	RN025
2	No	RN026
99	Don't know / refused	RN026

RN025. Which contacts or information sources actively emphasized energy efficiency? [DO NOT READ] [INTERVIEWER – RESPONSES MAY OVERLAP SOMEWHAT WITH RN023 RESPONSES.]

1	Comfort Home program brochures / model homes	RN026
2	ComfortWise program brochures / model homes	RN026
3	Energy Advantage program brochures / model homes	RN026
4	Energy Star program brochures / model homes	RN026
5	PG&E (other / miscellaneous)	RN026
6	SCE / Southern California Edison (other / miscellaneous)	RN026
7	SoCalGas (other / miscellaneous)	RN026
8	SDG&E (other / miscellaneous)	RN026
9	EPA / DOE / Other U.S. government source (other / miscellaneous)	RN026
10	Architect / designer(s)	RN026
11	Builder(s) / builder or development sales agents	RN026
12	Home inspector (buyer's inspector)	RN026
13	Lenders	RN026
14	Newspapers / magazines (general)	RN026
15	Realtors	RN026
16	"Consumer Reports" magazine	RN026
17	Other personal contact (i.e., not related to home sales industry)	RN026
18	PG&E program brochures / model homes	RN026
19	SCE / Southern California Edison program brochures / model homes	RN026

20	SoCalGas program brochures / model homes	RN026
21	SDG&E program brochures / model homes	RN026
22	Program brochures / model homes – non-specific	RN026
23	Home show	RN026
88	Other [SPECIFY:] _____	RN026
99	None / don't know / refused	RN026

[ASK RN026 UNLESS RESPONSES 1-88 IN RN023 AND RN025 ALL BLANK; IN THAT CASE GO TO AW029.]
RN026. Which contacts or information sources, if any, significantly increased your consideration of energy efficiency when shopping for [building] your new home? [DO NOT READ]

1	Comfort Home program brochures / model homes	AW029
2	ComfortWise program brochures / model homes	AW029
3	Energy Advantage program brochures / model homes	AW029
4	Energy Star program brochures / model homes	AW029
5	PG&E (other / miscellaneous)	AW029
6	SCE / Southern California Edison (other / miscellaneous)	AW029
7	SoCalGas (other / miscellaneous)	AW029
8	SDG&E (other / miscellaneous)	AW029
9	EPA / DOE / Other U.S. government source (other / miscellaneous)	AW029
10	Architect / designer(s)	AW029
11	Builder(s) / builder or development sales agents	AW029
12	Home inspector (buyer's inspector)	AW029
13	Lenders	AW029
14	Newspapers / magazines (general)	AW029
15	Realtors	AW029
16	"Consumer Reports" magazine	AW029
17	Other personal contact (i.e., not related to home sales industry)	AW029
18	PG&E program brochures / model homes	AW029
19	SCE / Southern California Edison program brochures / model homes	AW029
20	SoCalGas program brochures / model homes	AW029
21	SDG&E program brochures / model homes	AW029
22	Program brochures / model homes – non-specific	AW029
23	Home show	AW029
88	Other [SPECIFY:] _____	AW029
99	None / don't know / refused	AW029

[QUESTIONS 27 AND 28 SKIPPED ON PURPOSE.]

AW029. Please think about the features of a new home like yours that might have a significant impact on its energy efficiency, and on your energy bills. What features of your home come to mind? [DO NOT READ; RECORD ALL RESPONSES.]

[IF RESPONDENT SEEMS UNCLEAR:] I'm thinking about the basic features included as part of the home, or that you might install - not the different ways that you might use these features.

1	Air conditioner	AW030
2	Appliances (e.g., washer, dryer, range)	AW030
3	Clock thermostat	AW030
4	Construction type, 2X6 studs	AW030

5	Ducts – "tight" ducts, insulation-wrapped ducts	AW030
6	Clock thermostat	AW030
7	Fans (attic / whole-house)	AW030
8	Furnace / heating system	AW030
9	Heating fuel choice(s) (electric, gas, oil, wood, solar)	AW030
10	Heat pump	AW030
11	Insulation (roof / ceiling)	AW030
12	Insulation (doors / windows)	AW030
13	Insulation (hot water pipes)	AW030
14	Insulation (non-specific / other)	AW030
15	Lighting	AW030
16	Multiple zones	AW030
17	Shade trees / tree orientation	AW030
18	Soffit vents	AW030
19	Water heater	AW030
20	Whole-house design	AW030
21	Windows	AW030
88	Other [SPECIFY:]_____	AW030
99	Don't know / none / refused	AW030

AW030. Based on what you may have seen or heard, would you say that all new homes in your area and price range have about the same level of energy efficiency overall, or are there some new homes that are more energy-efficient than others?

1	Most new homes same / similar level of energy efficiency	AW031
2	Some new homes more energy-efficient than others	AW031
99	None / don't know / refused	AW031

AW031. Based on what you may have seen or heard, are most new homes in your area and price range about as energy-efficient as they can be, or are there ways they could be built more energy-efficiently?

1	Most new homes about as EE as they can be	AW032
2	New homes could be more energy-efficient	AW032
99	None / don't know / refused	AW032

[ASK AW032 IF "2" IN EITHER AW030 OR AW031 – OTHERWISE GO TO AW033.]
AW032. We're still thinking about new homes in your area and price range. In what specific ways could these new homes, in general, be made as energy-efficient as possible at the time of sale? [DO NOT READ, RECORD ALL RESPONSES:]

1	Air conditioner	AW033
2	Appliances (e.g., washer, dryer, range)	AW033
3	Clock thermostat	AW033
4	Construction type, 2X6 studs	AW033
5	Ducts – "tight" ducts, insulation-wrapped ducts	AW033
6	Clock thermostat	AW033
7	Fans (attic / whole-house)	AW033
8	Furnace / heating system	AW033
9	Heating fuel choice(s) (electric, gas, oil, wood, solar)	AW033
10	Heat pump	AW033

11	Insulation (roof / ceiling)	AW033
12	Insulation (doors / windows)	AW033
13	Insulation (hot water pipes)	AW033
14	Insulation (non-specific / other)	AW033
15	Lighting	AW033
16	Multiple zones	AW033
17	Shade trees / tree orientation	AW033
18	Soffit vents	AW033
19	Water heater	AW033
20	Whole-house design	AW033
21	Windows	AW033
88	Other [SPECIFY:]_____	AW033
99	Don't know / none / refused	AW033

AW033. Which of the following does your home have? [READ AND RECORD ALL "YES" RESPONSES.]

1	Heat pump	AW034
2	Central air conditioner	AW034
3	Gas furnace	AW034
4	Gas water heater	AW034
5	Electric water heater	AW034
98	[DO NOT READ:] None	AW034
99	[DO NOT READ:] DK / refused	AW034

[ASK AW034 IF HEAT PUMP OR CENTRAL AIR CONDITIONER AT AW033:]
AW034. For this next set of questions, please think back to the time when you were buying [building] your new home. At <u>that</u> point, how would you have determined the degree of energy efficiency provided by your home's [ANS. AT AW033]? [DO NOT READ, RECORD ALL RESPONSES]

[INTERVIEWER NOTE: WE ARE INTERESTED IN <u>PRE-MOVE-IN</u> CRITERIA, HERE AND AT SIMILAR QUESTIONS.]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR <u>SOURCE</u>, WE WANT TO PROBE THE INFORMATION <u>CONTENT</u>. WE ALSO WANT THE SOURCE RECORDED.]

1	"High SEER / EER"	AW035
2	"Low SEER / EER"	AW035
3	10 SEER / At least 10 SEER	AW035
4	11 SEER / At least 11 SEER	AW035
5	12 SEER / At least 12 SEER	AW035
6	13+ SEER / At least 13+ SEER	AW035
7	13+ SEER / At least 13+ SEER	AW035
8	SEER unspecified – or SEER outside 10-16 range	AW035
9	Energy Star label	AW035
10	Tight ducts	AW035

11	Comfort Home label	AW035
12	ComfortWise label	AW035
13	Energy Advantage label	AW035
14	Ask utility for information	AW035
15	Evaporative cooler (direct / indirect), evaporative pre-cooler	AW035
16	Ask builder / builder sales agent for information	AW035
17	Read / looked for product labels	AW035
18	Read product specifications	AW035
88	Other [SPECIFY:] _____	AW035
99	None / don't know / refused	AW035

[ASK AW035 IF GAS FURNACE AT AW033; OTHERWISE GO TO AW037.]
AW035. Would you say that gas furnaces…[READ LIST]?

1	All have pretty much the same levels of efficiency	AW037
2	Or differ substantially in efficiency levels	AW036
99	[DO NOT READ:] None / don't know / refused	AW037

AW036. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's gas furnace? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	"High AFUE"	AW037
2	"Low AFUE"	AW037
3	AFUE less than 80 percent	AW037
4	AFUE 80-84 percent	AW037
5	AFUE 85-89 percent	AW037
6	AFUE 90 percent or higher	AW037
7	AFUE unspecified – or outside 70-100 percent range	AW037
8	Energy Star label	AW037
9	Tight ducts	AW037
10	Comfort Home label	AW037
11	ComfortWise label	AW037
12	Energy Advantage label	AW037
13	Ask utility for information	AW037
14	Ask builder / builder sales agent for information	AW037
15	Read / looked for product labels	AW037
16	Read product specifications	AW037
88	Other [SPECIFY:] _____	AW037
99	None / don't know / refused	AW037

[ASK AW037 IF GAS WATER HEATER AT AW033; OTHERWISE GO TO AW039.]
AW037. Would you say that gas water heaters…[READ LIST]?

1	All have pretty much the same levels of efficiency	AW039
2	Or differ substantially in efficiency levels	AW038
99	[DO NOT READ:] None / don't know / refused	AW039

AW038. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's gas water heater? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	"High EF-Energy Factor"	AW039
2	"Low EF-Energy Factor"	AW039
3	EF of .40 to .52	AW039
4	EF of .53 to .59	AW039
5	EF of .60 to .66	AW039
6	EF of .66 and above	AW039
7	EF unspecified – or outside .40-.80	AW039
8	Energy Star label	AW039
9	Comfort Home label	AW039
10	ComfortWise label	AW039
11	Energy Advantage label	AW039
12	Ask utility for information	AW039
13	Ask builder / builder sales agent for information	AW039
14	Read / looked for product labels	AW039
15	Read product specifications	AW039
88	Other [SPECIFY:] _____	AW039
99	None / don't know / refused	AW039

[ASK AW039 IF ELECTRIC WATER HEATER AT AW033; OTHERWISE GO TO AW041.]
AW039. Would you say that electric water heaters…[READ LIST]?

1	All have pretty much the same levels of efficiency	AW041
2	Or differ substantially in efficiency levels	AW040
99	[DO NOT READ:] None / don't know / refused	AW041

AW040. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's electric water heater? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	"High EF-Energy Factor"	AW041

2	"Low EF-Energy Factor"	AW041
3	EF of .70 to .85	AW041
4	EF of .86 to .91	AW041
5	EF of .92 to .94	AW041
6	EF of .95 and above	AW041
7	EF unspecified – or outside .60-1.00	AW041
8	Energy Star label	AW041
9	Comfort Home label	AW041
10	ComfortWise label	AW041
11	Energy Advantage label	AW041
12	Ask utility for information	AW041
13	Ask builder / builder sales agent for information	AW041
14	Read / looked for product labels	AW041
15	Read product specifications	AW041
88	Other [SPECIFY:] _____	AW041
99	None / don't know / refused	AW041

AW041. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's attic or ceiling insulation? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	"High R-level of insulation"	AW042
2	"Low R-level of insulation"	AW042
3	R20-35 / At least R20-35	AW042
4	R36-45 / At least R36-45	AW042
5	R46 or more / At least R46 (or more)	AW042
6	R-level unspecified – or outside R20-R60 range	AW042
7	Energy Star label	AW042
8	Comfort Home label	AW042
9	ComfortWise label	AW042
10	Energy Advantage label	AW042
11	Ask utility for information	AW042
12	Ask builder / builder sales agent for information	AW042
13	Read / looked for product labels	AW042
14	Read product specifications	AW042
88	Other [SPECIFY:] _____	AW042
99	None / don't know / refused	AW042

AW042. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's wall insulation? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT

INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	"High R-level of insulation"	AW043
2	"Low R-level of insulation"	AW043
3	R5-10 / At least R5-10	AW043
4	R11-21 / At least R11-21	AW043
5	R22-27 / At least R22-27	AW043
6	R28 or more / At least R28 (or more)	AW043
7	R-level unspecified – or outside R5-30 range	AW043
8	Energy Star label	AW043
9	Comfort Home label	AW043
10	ComfortWise label	AW043
11	Energy Advantage label	AW043
12	Ask utility for information	AW043
13	Ask builder / builder sales agent for information	AW043
14	Read / looked for product labels	AW043
15	Read product specifications	AW043
88	Other [SPECIFY:] _____	AW043
99	None / don't know / refused	AW043

AW043. Would you say that different kinds of windows…[READ LIST]?

1	All have pretty much the same levels of efficiency	PE047
2	Differ substantially in efficiency levels	AW044
99	[DO NOT READ:] None / don't know / refused	PE047

AW044. At the time you were buying [building] your new home, how would you have determined the degree of energy efficiency provided by your home's windows? [DO NOT READ, RECORD ALL RESPONSES]

[IF RESPONDENT MENTIONS "READ THE LABEL," "READ THE PRODUCT SPECIFICATIONS," "TALKED TO THE BUILDER," PROBE: "WHAT ABOUT THAT INFORMATION WOULD TELL YOU HOW ENERGY-EFFICIENT THE [PRODUCT] IS?" THAT IS, WE DON'T WANT TO LEAD THEM, BUT ONCE THEY MENTION A PARTICULAR SOURCE, WE WANT TO PROBE THE INFORMATION CONTENT. WE ALSO WANT THE SOURCE RECORDED.]

1	Lower U factor (heat transfer)	PE047
2	Higher R-value (resistance to heat flow)	PE047
3	Non-aluminum frames	PE047
4	Lower SHGC (solar heat gain coefficient)	PE047
5	NFRC label (National Fenestration Rating Council)	PE047
6	Double or triple panes	PE047
7	Triple glazed	PE047
8	Higher VT (visible transmittance)	PE047
9	Gas (argon, krypton) insulation between panes	PE047
10	Low "e" (low-emissivity coatings)	PE047
11	"Warm edge" technology	PE047

12	Energy Star label	PE047
13	Comfort Home label	PE047
14	ComfortWise label	PE047
15	Energy Advantage label	PE047
16	Ask utility for information	PE047
17	Ask builder / builder sales agent for information	PE047
18	Read / looked for product labels	PE047
19	Read product specifications	PE047
88	Other [SPECIFY:] _____	PE047
99	None / don't know / refused	PE047

[QUESTIONS 45 AND 46 SKIPPED ON PURPOSE.]

PERCEPTIONS/INTENTIONS

PE047. Please think about the next time you may be shopping for a home. How likely will you be to actively investigate the energy use characteristics and energy efficiency of the homes you look at? Please give me a 1 to 10 rating, where 1 means you DEFINITELY WILL NOT investigate the energy efficiency of individual homes, and 10 means you DEFINITELY WILL investigate the energy efficiency of individual homes.

HERE WE ALSO TIGHTENED UP THE WORDING AND CHANGED THE SCALE ANCHORS…

#	1-10	PE048
99	Don't know / refused	PE048

[ASK PE048 IF AWARE OF ENERGY STAR HOME PROGRAM AT RN016 OR RN017; OTHERWISE GO TO PE049.]
PE048. Let's say you're buying your next home, and it has an Energy Star Homes Program label indicating that it is more energy-efficient than other new homes. Based on what you know about energy efficiency and Energy Star, how important would this information be in selecting one home over another? Please give me a rating on a scale of 1 to 10, where 1 is not at all important, and 10 is extremely important.

#	1-10	PE049
99	Don't know / refused	PE049

PE049. I'm going to read you a few brief statements, and ask you to rate each of them on a scale from 1 to 10, where 1 means you disagree completely, and 10 means you agree completely. [RANDOMIZE; READ STATEMENTS AND RECORD RATING; GO TO DE050 WHEN COMPLETE.]

a. Energy-efficient features in a new home cost more than they're worth
b. It takes too much time and hassle to find information about energy efficiency when I'm buying a home
c. I have a hard time believing energy efficiency information provided by new home builders
d. To interest me in energy-efficient features, the cost would have to be rolled into the mortgage
e. I am willing to invest in home features that will reduce my monthly costs
f. I will ONLY invest in those features that will affect the appearance and potential resale value of this home

DEMOGRAPHICS

DE050. Is your current home the first one you have ever owned?

1	Yes, first home ever owned	DE051
2	No, have owned other homes before (self or other HH head)	DE051
99	DK / refused	DE051

DE051. Into which of the following categories did your home's purchase price [construction cost] fall? [READ LIST]

1	Under $100,000	DE052
2	$100,000 but under $200,000	DE052
3	$200,000 but under $300,000	DE052
4	$300,000 but under $500,000	DE052
5	Or, $500,000 or more	DE052
99	[DO NOT READ:] DK / refused	DE052

DE052. How many bedrooms does your home have?

____

DE052a. Is your home in a tract development or subdivision where the homes are similar in design and were generally built during the same time frame?

Yes, tract home
No, other (i.e., custom)
DK / refused

DE053. To make sure we talk to a cross-section of people, into which of the following categories does your age fall? [READ LIST]

1	Under 30	DE054
2	30 to 39	DE054
3	40 to 49	DE054
4	50 to 59	DE054
5	60 to 69	DE054
6	Or, 70 or older	DE054
99	[DO NOT READ:] DK / refused	DE054

DE054. And again to make sure we talk to a cross-section of people, what is the highest level of education that you've completed? [READ LIST]

1	Some high school or less	DE055
2	High school graduate	DE055
3	Some college	DE055
4	Technical or associate's degree	DE055
5	Four-year college degree	DE055
6	Or, postgraduate or professional degree	DE055
99	[DO NOT READ:] DK / refused	DE055

DE055. How many people live in your household at least six months per year?

_____

DE056. What county do you live in? [WILL BE LISTED]

_____

DE057. What is your 5-digit ZIP code? ___ ___ ___ ___ ___

DE058. And finally, to make sure that we talked to a cross-section of people with this survey, which of the following best describes your household's 1998 income? [READ LIST]

1	Under $20,000	DE059
2	$20,000 but under $30,000	DE059
3	$30,000 but under $50,000	DE059
4	$50,000 but under $75,000	DE059
5	$75,000 but under $100,000	DE059
6	Or, over $100,000	DE059
99	[DO NOT READ:] DK/refused	DE059

DE059. [RECORD GENDER – DO NOT ASK:]

1	Female	CLOSING
2	Male	CLOSING
3	DK	CLOSING

CLOSING:

On behalf of [UTILITY] and Quantum Consulting, thank you very much for your time and valuable input on this important survey. Have a great day/evening.

RNC_NP Homebuyers_FINAL Quex.doc
2/22/00

STATEWIDE RNC
BUILDER SURVEY (CONTAINS PART. SEQUENCE)
FINAL

PG&E/Comfort Home builder……	1	PG&E Nonparticipant…….	5
SCE/ComfortWise builder……..	2	SCE/SCG Nonparticipant..	6
SDG&E/ComfortWise builder……	3	SDG&E Nonparticipant…..	7
SCG/Energy Advantage builder…	4		

NON-PARTICIPANT INTRODUCTION:

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help the Board better understand the market for energy-saving features in new tract homes. Could I please speak to the person responsible for making design and construction decisions affecting energy use?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. We're offering $100 to the appropriate person at your firm to speak with us for about half an hour.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help the Board better understand the market for energy-saving features in new tract homes. Can I confirm that you're the person responsible for making design and construction decisions affecting energy use?

Yes	[CONTINUE]
No/DK	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]
Refused	[TERMINATE]

This survey is extremely important to the Board's understanding of the new construction market. We're offering $100 if you'll spend about half an hour sharing with us your insights about the market for energy-saving features in new homes. All your answers are held confidential, that is, we never link any information to a particular person or company.
Is now a good time?

Yes	[CONTINUE]
No	[SET UP CALLBACK]
DK/refused	[TERMINATE]

PARTICIPANT INTRODUCTION:

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not

a sales call. The California Board for Energy Efficiency has asked us to help them assess the experience of builders who are participating in utility-sponsored energy efficiency programs. Could I please speak to [CONTACT NAME, OR:] the person responsible for making design and construction decisions affecting energy use?

[IF NECESSARY:] This survey is extremely important to the Board's assessment of program effectiveness. We're offering $100 to the appropriate person at your firm to speak with us for about half an hour.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them assess the experience of builders who are participating in utility-sponsored energy efficiency programs. Can I confirm that your company is participating in the [NAME APPROPRIATE UTILITY PROGRAM]?

Yes	[CONTINUE]
No/DK	[TERMINATE & VERIFY DATABASE INFORMATION]
Refused	[TERMINATE]

And, can I confirm that you're the person responsible for making design and construction decisions affecting energy use?

Yes	[CONTINUE]
No/DK	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]
Refused	[TERMINATE]

This survey is extremely important to the Board's understanding of the new construction market. We're offering $100 if you'll spend about half an hour sharing with us your insights about the market for energy-saving features in new homes. All your answers are held confidential, that is, we never link any information to a particular person or company.
Is now a good time?

Yes	[CONTINUE]
No	[SET UP CALLBACK]
DK/refused	[TERMINATE]

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer. A "custom" home is defined as a home designed and built for a particular customer. Also, we're focusing here on homes built in California, not elsewhere if you also do business outside California.

ICEBREAKER AND "MINIMAL BIAS" QUESTIONS

1. How many years have you been in the residential homebuilding industry? ____ years

2. About how many single-family homes will your firm build in California in 1999? Your best estimate is fine.

____ new homes [SHOULD BE AT LEAST 50 TO CONTINUE; OTHERWISE TERMINATE]

3. About what percentage of the single family homes you build in California this year will be tract homes, and what percent will be custom homes? Again, your best estimate is fine.

_____% Tract homes [MUST BE AT LEAST 25% TO CONTINUE]
_____% Custom homes
100%

4. About what percentage of the homes you'll build in 1999 are...[READ LIST]?

____% Under 2,000 square feet
____% 2,000 up to 3,000 square feet
____% 3,000 up to 4,000 square feet
____% 4,000 square feet or more

5. About what percentage of the homes you'll sell in 1999 are...[READ LIST]?

____% Under $100,000
____% $100,000 but under $200,000
____% $200,000 but under $300,000
____% $300,000 but under $500,000
____% $500,000 or more

6. Do you typically offer the following upgrade options? [READ LIST; RECORD ALL "YES" ANSWERS; PROBE FOR SPECIFICS FOR "YES" ANSWERS – SEER/AFUE/R-LEVELS, ALSO INSULATION LOCATIONS IF THEY CAN PROVIDE THAT.]

	Yes	**No/DK**		**SPECIFICS**
High-SEER air conditioner or heat pump	1	2		
High-AFUE furnace	1	2		
High-efficiency kitchen appliances	1	2		
High-efficiency insulation	1	2		
High-efficiency water heater		1	2	
High-efficiency windows	1	2		

---

7. Based on your experience in home construction, how much demand is there **in general** from homebuyers for energy-saving features? [READ LIST]

A lot
Some
Little

Very little
None [SKIP TO Q8b]
[DO NOT READ:] Don't know [SKIP TO Q8b]

8. And based on your experience, what energy saving home features do buyers look for, if any? [DO NOT READ; CIRCLE ALL; PUT CHECK MARK BY FIRST MENTION.]

Air conditioner / HVAC (high-efficiency)
Appliances (washer, dryer, range)
Clock thermostat
Construction type (e.g., 2X6 studs)
Daylighting / skylighting
Ducts – tight ducts, insulated ducts
Fans (attic, whole-house)
Furnace / heating system
Glazing area (ratio of glass to total wall area)
Heating fuel choice: _____
Heat pump
Insulation (roof)
Insulation (wall)
Insulation (doors / windows)
Insulation (hot water pipes)
Insulation – other: _____
Lighting
Multiple zones
Shade trees / tree orientation
Soffit vents
Water heater
Whole-house design
Windows (non-specific)
Windows (double / triple panes)
Windows (gas-filled – argon, krypton)
Windows (low-e, low-emissivity)
Other: _____
DK / None

8a. In general, how willing are home buyers **to pay for the additional costs** that may be associated with these energy-efficient measures? Are they … [READ LIST]?

Extremely willing
Very willing
Somewhat willing
Not very willing, or
Not at all willing
[DNR:] DK / refused

8b. Based on your experience, or what you've seen or heard, what do you believe are the

features in a new home that contribute the most to energy efficiency? [DO NOT READ; CIRCLE ALL; PUT CHECK MARK BESIDE FIRST MENTION. **THIS IS A KEY "KNOWLEDGE" QUESTION, SO AS NEEDED EXPAND ON RESPONSE OPTION TEXT, ADD OPTIONS, PROVIDE PARENTHETICAL DETAIL, ETC. ALSO, PROBE FOR SPECIFIC ENERGY EFFICIENCY CRITERIA WHERE THE RESPONDENT MAY BE ABLE TO PROVIDE IT.]**

E.E. CRITERIA??

Air conditioner / HVAC (high-efficiency)
Appliances (washer, dryer, range)
Clock thermostat
Construction type (e.g., 2X6 studs)
Daylighting / skylighting
Ducts – tight ducts, insulated ducts
Fans (attic, whole-house)
Furnace / heating system
Glazing area (ratio of glass to total wall area)
Heating fuel choice: _____
Heat pump
Insulation (roof)
Insulation (wall)
Insulation (doors / windows)
Insulation (hot water pipes)
Insulation – other: _____
Lighting
Multiple zones
Shade trees / tree orientation
Soffit vents
Water heater
Whole-house design
Windows (non-specific)
Windows (double / triple panes)
Windows (gas-filled – argon, krypton)
Windows (low-e, low-emissivity)
Other: _____
DK / None

8c. How regularly do you promote energy efficiency and energy-efficient features to buyers of new tract homes in California? Would you say…[READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK / refused

RNC / ENERGY STAR PROGRAM AWARENESS / PARTICIPATION / PERCEPTIONS / INTENTIONS

9. [Other than the program you're participating in,] Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those?

    NO/NONE/DK
    Comfort Home
    ComfortWise
    Energy Advantage
    Energy Star (Homes Program)
    Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q9; IF COMFORT HOME ALREADY MENTIONED, GO TO Q10A.]
9a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

    Yes (SKIP TO Q10a)
    No (SKIP TO Q14)
    Don't know (SKIP TO Q14)

[ASK IN SCE/SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q9C.]
OTHERWISE SKIP TO Q9C:]
9b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

    Yes (CONTINUE)
    No (CONTINUE)
    Don't know (CONTINUE)

[ASK IN SCE/SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q9; IF ENERGY ADVANTAGE ALREADY MENTIONED, FOLLOW Q9C "YES" LOGIC.]
9c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

    Yes (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q12a IF NOT)
    No (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)
    Don't know (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q13A.]
9d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q13a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK Q10a IF AWARE OF **PG&E COMFORT HOME**; OTHERWISE GO TO Q14.]
10a. Has your company participated in the PG&E Comfort Home Program during 1999?
[FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q10B.]

Yes (CONTINUE)
No (SKIP TO Q10c)
Don't know (SKIP TO Q10d)

10b. What is the main reason your company chose to participate in the Comfort Home Program? What are any other reasons?

[GO TO Q10D.]

10c. What is the main reason your company chose **not** to participate? What are any other reasons?

10d. Did your company participate in this program before 1999?

Yes (CONTINUE)
No (CONTINUE)
Don't know (SKIP TO Q10g)

[ASK Q10e IF FIRST-TIME PARTICIPANT IN PY99. ASK Q10f IF PRIOR PARTICIPANT BUT
NOT IN PY99. IF NEITHER, GO TO Q10g.]

10e. What caused you to participate for the first time in 1999? What other reasons?
[RECOGNIZE ONE RESPONSE MAY BE "FIRST YEAR I KNEW ABOUT IT," AND THAT'S FINE.]

10f. What caused you to discontinue your participation in 1999? What other reasons?

10g. Just to summarize, what are the builder participation requirements for the 1999 program as you understand them?

10h. Assuming the program is essentially unchanged next year, would you say that your firm
will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to participate next year?

Extremely likely

Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

10i. Why do you say that? Why else? [HERE WE WANT TO REALLY PROBE AND ASSESS PARTICIPANT DIS/SATISFACTIONS WITH THE PARTICIPATION EXPERIENCE.]

10j. [PROGRAM PARTICIPANTS ONLY:] What percent of all single family tract homes you'll build in California in 1999 will be program homes?

____ % program homes

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q10J ONLY:]
10k. What changes, if any, has your company made in its building practices in <u>non-program</u> homes, as a result of your participation in this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
10l. Would you continue these new building practices even without the program?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

10m. Why/why not? Why else do you say that?

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q10J ONLY:]
10n. How do you advertise or market program homes differently from non-program homes, if at all?

10o. In 1999, have you attended any utility-sponsored training sessions pertaining to energy-efficient new home construction?

Yes (CONTINUE)
No (SKIP TO Q14)
DK/refused (SKIP TO Q14)

10p. How has this utility-sponsored training impacted your business practices, if at all, in terms of energy-efficient tract home design or construction?

Builders' Survey 10

[ASK Q11a IF AWARE OF **SCE COMFORTWISE**; OTHERWISE GO TO Q12a.]
11a. Has your company participated in the Southern California Edison ComfortWise Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q11B.]

Yes (CONTINUE)
No (SKIP TO Q11c)
Don't know (SKIP TO Q11d)

11b. What is the main reason your company chose to participate in the ComfortWise Program? What are any other reasons?

[GO TO Q11D.]

11c. What is the main reason your company chose **not** to participate? What are any other reasons?

11d. Did your company participate in this program before 1999?

Yes (CONTINUE)
No (CONTINUE)
Don't know (SKIP TO Q11g)

[ASK Q11e IF FIRST-TIME PARTICIPANT IN PY99. ASK Q11f IF PRIOR PARTICIPANT BUT
NOT IN PY99. IF NEITHER, GO TO Q11g.]

11e. What caused you to participate for the first time in 1999? What other reasons? [RECOGNIZE ONE RESPONSE MAY BE "FIRST YEAR I KNEW ABOUT IT," AND THAT'S FINE.]

11f. What caused you to discontinue your participation in 1999? What other reasons?

11g. Just to summarize, what are the builder participation requirements for the 1999 program as you understand them?

11h. Assuming the program is essentially unchanged next year, would you say that your firm
will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to participate next year?

Extremely likely
Very likely

Somewhat likely
Not very likely
Not at all likely
DK/refused

11i. Why do you say that? Why else? [HERE WE WANT TO REALLY PROBE AND ASSESS PARTICIPANT DIS/SATISFACTIONS WITH THE PARTICIPATION EXPERIENCE.]

11j. [PROGRAM PARTICIPANTS ONLY:] What percent of all single family tract homes you'll build in California in 1999 will be program homes?

____ % program homes

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q11J ONLY:]
11k. What changes, if any, has your company made in its building practices in non-program homes, as a result of your participation in this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM(S):]
11l. Would you continue these new building practices even without the program?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

11m. Why/why not? Why else do you say that?

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q11J ONLY:]
11n. How do you advertise or market program homes differently from non-program homes, if at all?

11o. In 1999, have you attended any utility-sponsored training sessions pertaining to energy-efficient new home construction?

Yes (CONTINUE)
No (SKIP TO Q12a)
DK/refused (SKIP TO Q12a)

11p. How has this utility-sponsored training impacted your business practices, if at all, in

terms of energy-efficient tract home design or construction?

[ASK Q12a IF AWARE OF **SOCALGAS ENERGY ADVANTAGE**; OTHERWISE GO TO Q14.]

12a. Has your company participated in the SoCalGas Energy Advantage Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q12B.]

Yes (CONTINUE)
No (SKIP TO Q12c)
Don't know (SKIP TO Q12d)

12b. What is the main reason your company chose to participate in the Energy Advantage Program? What are any other reasons?

[GO TO Q12D.]

12c. What is the main reason your company chose **not** to participate? What are any other reasons?

12d. Did your company participate in this program before 1999?

Yes (CONTINUE)
No (CONTINUE)
Don't know (SKIP TO Q12g)

[ASK Q12e IF FIRST-TIME PARTICIPANT IN PY99. ASK Q12f IF PRIOR PARTICIPANT BUT NOT IN PY99. IF NEITHER, GO TO Q12g.]

12e. What caused you to participate for the first time in 1999? What other reasons? [RECOGNIZE ONE RESPONSE MAY BE "FIRST YEAR I KNEW ABOUT IT," AND THAT'S FINE.]

12f. What caused you to discontinue your participation in 1999? What other reasons?

12g. Just to summarize, what are the builder participation requirements for the 1999 program as you understand them?

12h. Assuming the program is essentially unchanged next year, would you say that your firm will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to participate next year?

Extremely likely

Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

12i. Why do you say that? Why else? [HERE WE WANT TO REALLY PROBE AND ASSESS PARTICIPANT DIS/SATISFACTIONS WITH THE PARTICIPATION EXPERIENCE.]

12j. [PROGRAM PARTICIPANTS ONLY:] What percent of all single family tract homes you'll build in California in 1999 will be program homes?

____ % program homes

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q12J ONLY:]
12k. What changes, if any, has your company made in its building practices in non-program homes, as a result of your participation in this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM(S):]
12l. Would you continue these new building practices even without the program?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

12m. Why/why not? Why else do you say that?

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q12J ONLY:]
12n. How do you advertise or market program homes differently from non-program homes, if at all?

12o. In 1999, have you attended any utility-sponsored training sessions pertaining to energy-efficient new home construction?

Yes (CONTINUE)
No (SKIP TO Q14)
DK/refused (SKIP TO Q14)

12p. How has this utility-sponsored training impacted your business practices, if at all, in

terms of energy-efficient tract home design or construction?

[ASK Q13a IF AWARE OF **SDG&E COMFORTWISE**; OTHERWISE GO TO Q14.]
13a. Has your company participated in the SDG&E ComfortWise Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q13B.]

Yes (CONTINUE)
No (SKIP TO Q13c)
Don't know (SKIP TO Q13d)

13b. What is the main reason your company chose to participate in the ComfortWise Progam? What are any other reasons?

[GO TO Q13D.]

13c. What is the main reason your company chose **not** to participate? What are any other reasons?

13d. Did your company participate in this program before 1999?

Yes (CONTINUE)
No (CONTINUE)
Don't know (SKIP TO Q13g)

[ASK Q13e IF FIRST-TIME PARTICIPANT IN PY99. ASK Q13f IF PRIOR PARTICIPANT BUT NOT IN PY99. IF NEITHER, GO TO Q13g.]

13e. What caused you to participate for the first time in 1999? What other reasons? [RECOGNIZE ONE RESPONSE MAY BE "FIRST YEAR I KNEW ABOUT IT," AND THAT'S FINE.]

13f. What caused you to discontinue your participation in 1999? What other reasons?

13g. Just to summarize, what are the builder participation requirements for the 1999 program as you understand them?

13h. Assuming the program is essentially unchanged next year, would you say that your firm will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to participate next year?

Extremely likely
Very likely

Somewhat likely
Not very likely
Not at all likely
DK / refused

13i. Why do you say that? Why else? [HERE WE WANT TO REALLY PROBE AND ASSESS PARTICIPANT DIS / SATISFACTIONS WITH THE PARTICIPATION EXPERIENCE.]

13j. [PROGRAM PARTICIPANTS ONLY:] What percent of all single family tract homes you'll build in California in 1999 will be program homes?

____ % program homes

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q13J ONLY:]
13k. What changes, if any, has your company made in its building practices in <u>non-program</u> homes, as a result of your participation in this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
13l. Would you continue these new building practices even without the program?

Yes (CONTINUE)
No (CONTINUE)
DK / refused (CONTINUE)

13m. Why / why not? Why else do you say that?

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q13J ONLY:]
13n. How do you advertise or market program homes differently from non-program homes, if at all?

13o. In 1999, have you attended any utility-sponsored training sessions pertaining to energy-efficient new home construction?

Yes (CONTINUE)
No (SKIP TO Q14)
DK / refused (SKIP TO Q14)

13p. How has this utility-sponsored training impacted your business practices, if at all, in terms of energy-efficient tract home design or construction?

[ASK IF DOES NOT VOLUNTEER AWARENESS OF ENERGY STAR HOMES PROGRAM AT
Q9, OTHERWISE GO TO Q14a:]

14. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (SKIP TO Q15)
Don't know (SKIP TO Q15)

14a. Has your company participated in the Energy Star Homes Program during 1999?

Yes (CONTINUE)
No (SKIP TO Q14d)
Don't know (SKIP TO Q15)

[PG&E SERVICE TERRITORY **ONLY**, TO AVOID CONFUSION ELSEWHERE:]
14b. Did you build any Energy Star Model Homes in 1999? [IF YES:] How many?

_____ E.S. Model Homes
No/NONE

[ALL ENERGY STAR PARTICIPANTS:]
14c. What is the main reason your company chose to participate in the Energy Star program? What are any other reasons?

[GO TO Q14e]

14d. What is the main reason your company chose **not** to participate in the Energy Star program? What are any other reasons?

14e. Just to summarize, what are the builder participation requirements for the 1999 Energy Star Homes Program as you understand them?

14f. Assuming the program is essentially unchanged next year, would you say that your firm will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to participate next year?

Extremely likely
Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

14g. Why do you say that? Why else? [HERE WE WANT TO REALLY PROBE AND ASSESS PARTICIPANT DIS/SATISFACTIONS WITH THE PARTICIPATION EXPERIENCE.]

14h. [PROGRAM PARTICIPANTS ONLY:] What percent of all single family tract homes you'll
build in California in 1999 will be Energy Star homes?

____ % Energy Star homes

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q14H ONLY:]
14i. What changes, if any, has your company made in its building practices in <u>non-program</u> homes, as a result of your participation in this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
14j. Would you continue these new building practices even without the program?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

14k. Why/why not? Why else do you say that?

[PROGRAM PARTICIPANTS REPORTING LESS THAN 100% AT Q14H ONLY:]
14l. How do you advertise or market program homes differently from non-program homes, if at all?

KNOWLEDGE OF, COMPLIANCE WITH, AND EXCEEDING TITLE 24

15. [IF PARTICIPATE IN PROGRAMS:] In 1999, will your company build in any homes in California that exceed Title 24, but are not part of one of the programs I asked about earlier? That is, homes that aren't directly supported by incentive dollars or program marketing and advertising, but that are more energy-efficient than required by code.

[IF NONPARTICIPANT IN ALL PROGRAMS:]
In 1999, will your company build any homes in California that were designed to exceed Title 24 energy code?

Yes (CONTINUE)
No (SKIP TO Q24)
Not aware of/familiar with Title 24 (SHOULDN'T HAPPEN! EXPLAIN/REMIND RESPONDENTS THAT TITLE 24 IS THE MANDATED ENERGY STANDARD FOR NEW HOMES IN CALIFORNIA)
DK (SKIP TO Q25)

16. What percentage of all of your tract homes built in California in 1999 will exceed Title 24 (without any energy efficiency program support)? Your best estimate is fine.

_____ %

17. What reasons or factors determine whether or not you design a particular home or development to exceed Title 24 (without any energy efficiency program support)? What other reasons or factors?

[ASK IF PARTICIPATED IN UTILITY OR ENERGY STAR PROGRAMS EARLIER:]
18. How important has your participation in the energy efficiency programs we discussed earlier been in your decision to build homes that exceed Title 24, without any energy efficiency program support? Would you say program participation has been… [READ LIST]?

Extremely important
Very important
Somewhat important
Not very important, or
Not at all important
[DNR:] DK/refused

19. Why do you say that?

20. For tract homes that your company will build in 1999 that exceed Title 24, what design practices or measures were used to exceed Title 24?

[ASK UNLESS 100% OF HOMES EXCEED TITLE 24:]
21. In 1999, how have you marketed homes exceeding Title 24 differently from your homes that do not exceed Title 24, if at all?

[GO TO Q.25]

[QUESTIONS 22-23 SKIPPED ON PURPOSE.]

24. What is the main reason your firm doesn't build any tract homes in California that exceed Title 24 (other than those built as part of a program)? Why else?

25. Overall, how willing are buyers to pay for energy savings features that exceed Title 24? This is regardless of whether the buyer is aware of the code requirements. Would you say...[READ LIST]?

A lot
Some
Little
Very little
None [SKIP TO Q30]
[DO NOT READ:] Don't know [SKIP TO Q30]

26. Let's say that you were to build a single family tract home that exceeds Title 24 by 10 percent, and you don't receive any incentives. About how much extra would this cost, in dollars, beyond the base cost of the home?

_____$

27. In percentage terms, how much of this extra amount do you think a typical buyer is willing to pay, assuming the buyer is made aware of the features that make the home exceed Title 24 by 10 percent?

_____%

28. Let's assume that buyers would be willing to pay for 100% of the additional cost of exceeding Title 24 by 10 percent. What, if anything, besides the extra cost might prevent your company from providing the energy-efficient features buyers are willing to pay for?

29. Other than rebates or incentives, what else could others do to help your company meet buyer demand for more energy-efficient homes? This might include utilities, government, subcontractors, or others who might help meet buyer demand for energy efficiency.

PERCEIVED HOMEBUYER CHARACTERISTICS/PREFERENCES

30. Now let's talk a little bit more about homebuyers. Would you say home buyer demand for energy-saving features has increased, decreased, or stayed the same over the last 5 years?

Increased (CONTINUE)
Decreased (CONTINUE)
Stayed same (CONTINUE)
DK/refused (GO TO Q32)

31a. Why do you think that is?

32. In your opinion, do buyers expect all newer homes, say 5 years old or less, to be built to save energy?

Yes
No
Don't know/don't have direct contact with buyers

33. Have homebuyers you've worked with ever specifically asked about homes that were more energy efficient than the state building code requires?

Yes
No
Don't know / don't have direct contact with buyers

IF YES:
33a. About what percentage over the last year or so? _____

34. How much, if at all, would you say home buyers associate energy saving features with home quality? Please use a scale of 1 to 5 where 1 is not at all, and 5 is very strongly.

1 2 3 4 5 Don't know

35. How much, if at all, would you say home buyers associate energy saving features with home comfort? Please use a scale of 1 to 5 where 1 is not at all, and 5 is very strongly.

1 2 3 4 5 Don't know

36. Among homebuyers who care about energy efficiency and are willing to pay for energy-saving features, how important do you think having the Energy Star brand would be in their selection of a home? Please use a scale of 1 to 5 where 1 is not at all important, and 5 is extremely important.

1 2 3 4 5 Don't know

37. Why do you say that? Why else?

BUILDER BARRIERS, PERCEPTIONS, AND INTENTIONS

38. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from building and selling more energy-efficient homes, that is, homes that exceed the standard Title 24 code. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

Increased home cost associated with including energy-saving features _____
Lack of homebuyer willingness to pay for energy efficiency _____
Lack of information on how to incorporate energy efficiency in new homes _____
Lack of financing for homebuyers that factors in energy savings _____
Concern that the specific features won't save as much as buyers expect _____
Not enough specific options for saving energy _____
Difficulty for my firm in choosing among options for saving energy _____
The hassles involved in providing energy-saving options _____
Supply and availability problems with energy-saving products _____
Problems finding subcontractors who are well-trained regarding installation of energy-efficient measures _____
Problems coordinating among different subcontractors whose work affects energy efficiency _____
Company policies and procedures that hinder the use of energy-efficient designs _____

39. Given the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from building and selling more energy-efficient homes?

40. On a scale from 1 to 5, where 1 is not at all important and 5 is extremely important, how important is each of the following factors in determining the energy efficiency of homes you build <u>outside</u> of any utility programs? [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

Buyer willingness to pay for the incremental cost _____
Recommendation of Title 24 contractor _____
Recommendation of HVAC contractors _____
Recommendation of product distributors _____
Recommendation of product manufacturers _____
Recommendation of architects or designers _____
Recommendation of sales agents or realtors _____
Recommendation of other in-house personnel _____
Product offerings by competing builders _____
Your own personal experience _____
Educational or advertising support of local utilities _____
Educational or advertising support of relevant government agencies _____
Information and support from realtors and sales agents _____
Mortgage and appraisal policies of lenders and appraisers _____

41. Please think about everything you've experienced, seen, or heard about energy-saving measures in new homes, as well as buyer willingness to pay for new homes. On that basis, over the next 2 or 3 years would you expect the proportion of your company's home sales that exceed minimum energy efficiency codes to increase, decrease, or stay the same? This would exclude any utility or other energy efficiency programs.

Increase
Decrease
Stay the same
DK/refused

42. What changes, if any, do you think are likely in terms of the ways that you'll address energy efficiency issues in house design and construction, over the next 2 or 3 years?

HVAC DESIGN / EEM'S / WRAP-UP

43. Now I have a question about your approach to designing HVAC and duct systems, outside of any homes built as part of a utility program. First, how often do your tract homes integrate HVAC and duct design, to ensure correct sizing of HVAC equipment? [READ LIST.]

Always, (CONTINUE)
Often, (CONTINUE)
Sometimes, (CONTINUE)
Rarely (SKIP TO Q45)
Or, never (SKIP TO Q45)
DK/refused (SKIP TO Q45)

43a. How do you typically go about integrating HVAC and duct design?

[ASK OF PROGRAM PARTICIPANTS ONLY:]
44. How important has the [PROGRAM] program been in influencing you to pursue integrated HVAC system design? Please give me a rating from 1 to 5, where 1 means it's not at all important, and 5 means it's extremely important.

_____

45. Now I'd like to ask you a few questions about home financing. There is something called an "energy efficiency" mortgage. This allows the buyer to qualify more easily or borrow more

money on the assumption their energy bills will be lower so they will have more income available to pay their mortgage. Have you ever heard of this before I explained it?

Yes (CONTINUE)
No (GO TO Q48)
Don't know (GO TO Q48)

46. Are these types of mortgages are available in your area?

Yes (CONTINUE)
No (GO TO Q48)
Don't know (GO TO Q48)

47. Have any of your 1999 homebuyers have used an energy efficiency mortgage?

Yes
No
Don't know
Refused

48. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

The California Board for Energy Efficiency and Quantum Consulting also value the opinions and input of tract home sales agents and architect / designers. We would like to speak with sales agents or architects / designers regularly involved with your tract home developments, whether as employees or as outside resources. We have a briefer and somewhat different survey that asks questions pertaining to their roles, and we will pay them $35 for their time. May I get the names of sales agents or architect / designers regularly involved in your tract home developments?

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.

VERIFY MAILING INFORMATION FOR INCENTIVE CHECK:

RNC_Builder_FINAL Quex.doc
2 / 22 / 00

STATEWIDE RNC
ARCHITECT/DESIGNER SURVEY
FINAL

PG&E service territory……1
SCE/SCG service territory…. 2
SDG&E service territory…….3

INTRODUCTION/SCREENING

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes. Could I please speak to [CONTACT PROVIDED BY BUILDER, OR:] an architect who has a lot of experience in designing new tract homes?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. We're offering $35 to [contact / the appropriate person at your firm] to speak with us for about 15 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes.

You're one of a select group of architects and designers we're interviewing who have a lot of experience in designing new tract homes. We're offering $35 if you'll speak with us for about 15 minutes. Is now a good time?

Yes	[CONTINUE]
No/DK	[SET UP CALLBACK]
Refused	[TERMINATE]
Not experienced in designing new tract homes	[ASK TO SPEAK WITH APPROPRIATE INDIVIDUAL]

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. All your answers are held confidential, that is, we never link any information to a particular person or company. You were suggested as a good contact for this survey after we interviewed [BUILDER] as part of this same study.

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer.

1. How many years have you been designing new tract homes?

_____ Years designing new tract homes

1a. Are you a member of the American Institute of Architects (AIA) or the Society of American Registered Architects (SARA)?

Yes, member of AIA
Yes, member of SARA
Yes, member of both
No, member of neither
DK/refused

1b. How many architects work at your company?

_____ Architects in company

1c. Is all of your firm's residential new construction design work done for new homes in California, or does your firm design new homes outside California too?

All in California (CONTINUE)
Some outside CA **("OK, for the rest of the survey we're talking just about your firm's**
DK/refused (CONTINUE) **work <u>in California</u>")**

1d. In total, how many homes of all sorts did your company design in 1999?

____ Homes designed

1e. About what percentage of the homes your firm designed in 1999 were brand new, single family tract homes? [IF NECESSARY:] Your best estimate is fine.

_____% Brand new, single family tract homes [TERMINATE IF LESS THAN 10%]

2. OK, for the rest of the survey we'll be talking about new, single family tract homes your firm designed in California in 1999. About what percentage of the new, single family tract homes your firm designed in 1999 are …[READ LIST]?

____% Under 2,000 square feet
____% 2,000 up to 3,000 square feet
____% 3,000 up to 4,000 square feet
____% 4,000 square feet or more
DK/refused

3. About what percentage of the new single family tract homes your firm designed in 1999 are...[READ LIST]?

____% Under $100,000

____% $100,000 to $200,000
____% $200,000 to $300,000
____% $300,000 to $500,000
____% Over $500,000
DK/refused

4. Are the new single family tract homes you designed in 1999 mostly in coastal areas, mostly inland, or a mix of coastal and inland locations? [IF NECESSARY, CLARIFY THAT "COASTAL" REFERS TO CLIMATE, NOT "OCEAN VIEW"/PREMIUM LOCATION.]

Mostly (exclusively) coastal
Mostly (exclusively) inland
Mix of coastal and inland
DK/refused

[ASK Q4A IF ARCHITECT/DESIGNER WORKS FOR DIFFERENT FIRM THAN REFERRING BUILDER, BASED ON SAMPLE INFORMATION; OTHERWISE, GO TO Q4D.]
4a. [Just to check,] Did you have any agreements with builders of tract home developments in 1999, where your firm was the prime contractor responsible for overall project design?

Yes (CONTINUE)
No (SKIP TO Q4d)
DK/refused (SKIP TO Q4d)

4b. About how many homes did your firm design for new tract developments where your firm was the overall project designer, during 1999?

_____ Homes designed where firm is overall project designer

4c. And, for how many tract home builders or developers was your firm the overall project designer in 1999? [THIS IS FIRMS, NOT DEVELOPMENTS]

_____ Builders/developers for whom firm is overall project designer
[GO TO Q5]

[ASK Q4D ONLY IF RESPONDENT WORKS FOR REFERRING BUILDER:]
4d. Just to check, is your firm or work group actually part of [REFERRING BUILDER]?

Yes (CONTINUE)
No (CLARIFY CONNECTION TO REFERRING BUILDER AS NEEDED)
DK/refused (CONTINUE)

BUYER INTEREST IN/EXPOSURE TO ENERGY EFFICIENCY

5. Based on your experience or what you've seen or heard, how much demand do you perceive there to be **in general** for energy-saving features, among buyers of new single family tract homes? [READ LIST]

A lot (CONTINUE)
Some (CONTINUE)
Little (CONTINUE)
Very little (CONTINUE)
Or, none (CONTINUE)
[DO NOT READ:] Don't know / don't have much direct buyer contact / refused
(SKIP TO Q6)

5a. And what experiences or sources of information have contributed to your perception? [IF NECESSARY, PROBE FOR DIRECT INTERACTION WITH BUYERS, VERSUS INPUT FROM BUILDERS OR DEVELOPERS, VERSUS THIRD-PARTY INFORMATION OR OTHER SOURCES / EXPERIENCES.]

6. Based on your experience, or what you've seen or heard, what do <u>you</u> believe are the features in a new home that contribute the most to energy efficiency? [DO NOT READ; CIRCLE ALL; PUT CHECK MARK BY <u>FIRST MENTION</u>. **<u>PROBE FOR E.E. CRITERIA</u>**.]

<u>E.E. CRITERIA</u>

Air conditioner / HVAC (high-efficiency)
Appliances (washer, dryer, range)
Clock thermostat
Construction type (e.g., 2X6 studs)
Daylighting / skylighting
Ducts – tight ducts, insulated ducts
Fans (attic, whole-house)
Furnace / heating system
Glazing area (ratio of glass to total wall area)
Heating fuel choice: _____
Heat pump
Insulation (roof)
Insulation (wall)
Insulation (doors / windows)
Insulation (hot water pipes)
Insulation – other: _____
Lighting
Multiple zones
Shade trees / tree orientation
Soffit vents
Water heater
Whole-house design
Windows (non-specific)
Windows (double / triple panes)
Windows (gas-filled – argon, krypton)
Windows (low-e, low-emissivity)
Other: _____

DK / None

7. How regularly do you promote energy efficiency and energy-efficient features to builders or developers of new tract homes? Would you say…[READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK / refused

[Q8 EXCLUDED ON PURPOSE.]

RNC / ENERGY STAR PROGRAM AWARENESS / PARTICIPATION / PERCEPTIONS / INTENTIONS

9. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those?

NO / NONE / DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q9; IF COMFORT HOME ALREADY MENTIONED, GO TO Q10A.]
9a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q10a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK IN SCE / SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q9C.]
9b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE / SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN

Q9; IF ENERGY ADVANTAGE ALREADY MENTIONED, FOLLOW Q9C "YES" LOGIC.]
9c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q12a IF NOT)
No (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)
Don't know (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q13A.]
9d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q13a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK Q10a IF AWARE OF **PG&E COMFORT HOME**; OTHERWISE GO TO Q14.]
10a. As far as you know, in 1999 has your firm designed any new tract homes that have been, or will be, built under the PG&E Comfort Home Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF ARCHITECT/DESIGNER IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q10E; OTHERWISE ASK Q10B.]
10b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] For how many builders have you designed program homes in 1999?

10c. How many program homes have you designed in 1999?

____ Homes

10d. And, how did your design approach for these program homes differ from your design approach for typical new tract homes, if at all?

10e. What changes, if any, have you made in your approach to designing new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
10f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

10g. Why/why not? Why else do you say that?

[ASK Q11a IF AWARE OF **SCE COMFORTWISE**; OTHERWISE GO TO Q12a.]
11a. As far as you know, in 1999 has your firm designed any new tract homes that have been, or will be, built under the Southern California Edison ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q12a)
Don't know (SKIP TO Q12a)

[IF ARCHITECT/DESIGNER IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q11E; OTHERWISE ASK Q11B.]
11b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you designed program homes in 1999?

11c. How many program homes have you designed in 1999?

____ Homes

11d. And, how did your design approach for these program homes differ from your design approach for typical new tract homes, if at all?

11e. What changes, if any, have you made in your approach to designing new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
11f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

11g. Why/why not? Why else do you say that?

[ASK Q12a IF AWARE OF **SOCALGAS ENERGY ADVANTAGE**; OTHERWISE GO TO Q14.]

12a. As far as you know, in 1999 has your firm designed any new tract homes that have been, or will be, built under the Southern California Gas Energy Advantage Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF ARCHITECT/DESIGNER IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q12E; OTHERWISE ASK Q12B.]

12b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you designed program homes in 1999?

12c. How many program homes have you designed in 1999?

____ Homes

12d. And, how did your design approach for these program homes differ from your design approach for typical new tract homes, if at all?

12e. What changes, if any, have you made in your approach to designing new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]

12f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

12g. Why/why not? Why else do you say that?

[ASK Q13a IF AWARE OF **SDG&E COMFORTWISE**; OTHERWISE GO TO Q14.]
13a. As far as you know, in 1999 has your firm designed any new tract homes that have been, or will be, built under the SDG&E ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF ARCHITECT/DESIGNER IS DEDICATED TO ONE BUILDER AT 4D, SKIP TO Q13E; OTHERWISE ASK Q13B.]
13b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you designed program homes in 1999?

13c. How many program homes have you designed in 1999?

____ Homes

13d. And, how did your design approach for these program homes differ from your design approach for typical new tract homes, if at all?

13e. What changes, if any, have you made in your approach to designing new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
13f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

13g. Why/why not? Why else do you say that?

[ASK IF DOES NOT VOLUNTEER AWARENESS OF ENERGY STAR HOMES PROGRAM AT
Q9, OTHERWISE GO TO Q14a:]

14. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (SKIP TO Q15)
Don't know (SKIP TO Q15)

14a. As far as you know, in 1999 has your firm designed any new tract homes that have been, or will be, built under the Energy Star Homes Program?

Yes (CONTINUE)
No (SKIP TO Q15)
Don't know (SKIP TO Q15)

[IF ARCHITECT/DESIGNER IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q14E; OTHERWISE ASK Q14B.]

14b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you designed program homes in 1999?

14c. How many program homes have you designed in 1999?

____ Homes

14d. And, how did your design approach for these program homes differ from your design approach for typical new tract homes, if at all?

14e. What changes, if any, have you made in your approach to designing new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]

14f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)

DK / refused (CONTINUE)

14g. Why / why not? Why else do you say that?

KNOWLEDGE OF, COMPLIANCE WITH, AND EXCEEDING TITLE 24

15. [IF PARTICIPATE IN PROGRAMS:] In 1999, did your firm design any homes that exceed Title 24, but are not part of one of the programs I asked about earlier? That is, homes where special design and construction practices aren't directly supported by incentive dollars or program marketing and advertising, but are more energy-efficient than required by code.

[IF NONPARTICIPANT IN ALL PROGRAMS:]
In 1999, did your firm design any homes that exceed Title 24 energy code?

Yes (CONTINUE)
No (SKIP TO Q25)
Not aware of / familiar with Title 24 (SHOULDN'T HAPPEN! EXPLAIN / REMIND RESPONDENTS THAT TITLE 24 IS THE MANDATED ENERGY STANDARD FOR NEW HOMES IN CALIFORNIA)
DK (SKIP TO Q26)

16. What percentage of the tract homes your firm designed in 1999 exceeded Title 24 (without any energy efficiency program support)? Your best estimate is fine.

_____ %

17. What reasons or factors determine whether or not you exceed Title 24 in a particular home or development (without any energy efficiency program support)? What other reasons or factors? [PROBE FOR DEGREE / FREQUENCY WITH WHICH ARCHITECT / DESIGNER DECIDES THIS, VERSUS BUILDER / PROJECT MANAGER / OTHERS DRIVING IT.]

17a. How influential would you say architects are in determining whether a tract home exceeds Title 24 standards? Would you say … [READ LIST]?

Extremely influential
Very influential
Somewhat influential
Not very influential, or
Not at all influential
[DNR:] DK / refused

17b. Why do you say that?

[ASK Q18 IF PARTICIPATED IN UTILITY OR ENERGY STAR PROGRAMS EARLIER; OTHERWISE, SKIP TO Q20.]

18. How important has your participation in the energy efficiency programs we discussed earlier been in deciding whether or not to design homes that exceed Title 24, without any energy efficiency program support? Would you say program participation has been… [READ LIST]?

    Extremely important
    Very important
    Somewhat important
    Not very important, or
    Not at all important
    [DNR:] DK/refused

19. Why do you say that?

20. For tract homes your firm designed in 1999 that exceed Title 24, what energy-efficient design or construction practices, equipment, or features were used to exceed Title 24?

    [GO TO Q.26]

[QUESTIONS 21-24 SKIPPED ON PURPOSE.]

25. What is the main reason your firm didn't design any tract homes that exceed Title 24 (other than those built as part of a program)? Why else?

26. Let's say that you were to design a single family tract home that exceeds Title 24 by 10 percent, without any builder or buyer incentives. About how much extra would this cost, in dollars, beyond the base cost of the home? (You can use % as a backup)

    _____$

27. Let's assume that builders and developers would be willing to pay for 100% of the additional cost of exceeding Title 24 by 10 percent. What, if anything, besides the extra

cost might prevent you from designing tract homes that are built to be energy-efficient?

[Q.28-37 SKIPPED ON PURPOSE.]

BARRIERS, PERCEPTIONS, AND INTENTIONS

38. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from designing tract homes that are built to be more energy-efficient. That is, homes that exceed the state code for energy efficiency, which all new homes must meet. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

    Increased home cost associated with including energy-saving features _____
    Lack of information on how to incorporate energy efficiency in new homes _____
    Concern that the specific features won't save as much as buyers expect _____
    Not enough specific options for saving energy _____
    Difficulty in choosing among options for saving energy _____
    Supply and availability problems with energy-saving products _____
    The hassles involved in providing energy-saving options _____
    Builder policies and procedures that hinder the use of energy-efficient designs _____
    Tradeoffs in other aspects of home design required by energy-efficient features _____
    Lack of homebuyer confidence in the benefits of energy efficiency _____
    Lack of homebuyer willingness to pay for energy efficiency _____

39. Given the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from designing tract homes that are built to be more energy-efficient?

40. Please think about everything you've experienced, seen, or heard about energy-saving measures in new homes, as well as buyer willingness to pay for new homes. On that basis, over the next 2 or 3 years would you expect the proportion of your new tract home designs that exceed minimum energy efficiency codes to increase, decrease, or stay the same? This would <u>exclude</u> any utility or other energy efficiency programs.

    Increase
    Decrease
    Stay the same
    DK/refused

41. What changes, if any, do you think are likely in terms of the <u>ways</u> that you'll address energy efficiency issues in designing new tract homes, over the next 2 or 3 years?

TRAINING / INFORMATION SOURCES / WRAP-UP

42. If you want to learn more about energy-saving design practices or home features, what resources would you go to for help and information? What others?

43. Are you aware of any training on energy efficiency provided by California-based utilities in 1999?

Yes
No (SKIP TO Q48)
Don't know / refused (SKIP TO Q48)

43a. Who was the sponsor or sponsors of this training? [RECORD ALL MENTIONS]

PG&E
SCE
SoCalGas
SDG&E
Other: _____
DK / refused

44. Have you attended any of these training sessions this year? [RECORD ALL MENTIONS]

Yes, PG&E
Yes, SCE
Yes, SoCalGas
Yes, SDG&E
Yes, other: _____
No (SKIP TO Q48)
Don't know / refused (SKIP TO Q48)

45. How has this training affected the way you design new tract homes, if at all? [IF NECESSARY, DISTINGUISH BETWEEN TRAINING SPONSORED BY SPECIFIC UTILITIES.]

[QUESTIONS 46-47 SKIPPED ON PURPOSE.]

48. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.

VERIFY MAILING INFORMATION FOR INCENTIVE CHECK:

RNC_Architect-Designer_FINAL Quex.doc
2 / 22 / 00

STATEWIDE RNC
APPRAISERS SURVEY
FINAL

PG&E service territory……. 1
SCE/SCG service territory… 2
SDG&E service territory….. 3

INTRODUCTION/SCREENING/ICEBREAKERS

Hello, my name is _____ and I'm calling from Quantum Consulting, a market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the home appraisal process. May I please speak with the person most involved in making decisions about home appraisal policies and procedures?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of how different aspects of a home affect its appraisal. We're offering $35 to the appropriate person at your firm to speak with us for about 15 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the home appraisal process. Can I confirm that you're the person at this firm most involved in decisions about home appraisal policies and procedures?

Yes	[CONTINUE]
No/DK	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]
Refused	[TERMINATE]

This survey is extremely important to the Board's understanding of how different aspects of a home affect its appraisal. We're offering $35 if you'll spend about 15 minutes sharing with us your insights in this area.

[IF NECESSARY:]
All your answers are held confidential, that is, we never link any information to a particular person or company. Is now a good time?

Yes	[CONTINUE]
No	[SET UP CALLBACK]
DK/refused	[TERMINATE]

[IF SETTING UP CALLBACK, TRY TO FIND OUT IF THEY DO NEW AND EXISTING
HOME APPRAISALS, OR JUST/PRIMARILY EXISTING HOME APPRAISALS.]

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer. A "custom" home is defined as a home designed and built for a particular customer.

[Q'S 1, 2, 4, 7 & 9 EXCLUDED ON PURPOSE.]

3. About how many home appraisals will your firm conduct in California in 1999?

_____ Home appraisals in 1999

5. What percentage of your firm's home appraisals in 1999 will be for … [READ LIST; RESPONSES SHOULD SUM TO 100%]?

_____ NEW single family detached tract homes
_____ EXISTING single family detached tract homes
_____ OTHER homes (e.g., non-SFD, or custom homes)
100%

"OK, for the rest of this survey we'll be talking about appraisals for single family detached homes in tract developments."

6. Does your firm mostly serve coastal areas of California, inland areas, or a mix of coastal and inland areas? [THIS MEANS CLIMATE ZONES, NOT COASTAL AS "OCEAN-VIEW" PROPERTIES.]

Mostly (exclusively) coastal
Mostly (exclusively) inland
Mix of coastal and inland
DK / refused

8. And about what percentage of the tract homes your firm appraised in 1999 falls into each of the following price categories? [READ LIST] Your best estimate is fine.

Under $100,000	_____%
$100,000 but under $200,000	_____%
$200,000 but under $300,000	_____%
$300,00 but under $500,000	_____%
$500,000 or more	_____%

CHARACTERISTICS OF APPRAISALS AND APPRAISAL PROCESS

10. Please describe for me the primary ways that you arrive at a home's appraised value. [AS NECESSARY, PROBE FOR THE USE OF MARKET "COMPS," HOME-SPECIFIC FEATURES, AND HOW THESE ARE BALANCED AGAINST EACH OTHER.] [ALSO PROMPT AS NEEDED:] Tell me a bit about what aspects of the home, if any, are particularly open to your judgment or interpretation regarding how

they affect the appraisal. [STILL A CUT CANDIDATE IF WE CONTINUE TO JUST GET GENERAL "MARKET COMPARABLES" RESPONSE…]

[ASK Q11 IF NOT ADDRESSED IN Q10:]

11. Do you use software or other tools or worksheets that allow you to systematically adjust home values based on specific home features? [IF YES:] Please tell me a little bit about that / them.

[Q'S 12 AND 13 EXCLUDED ON PURPOSE.]

14. How often are your firm's overall home appraisal policies and procedures reviewed? [RECORD IN MOST APPROPRIATE CATEGORY. MAKE SURE RESPONDENT IS CLEAR THAT WE'RE ASKING ABOUT CHANGES IN POLICIES AND PROCEDURES, NOT APPRAISAL VALUES.]

    Ongoing basis / depends on market conditions
    Once a quarter
    More than once a year
    Annually
    Every 2-3 years
    Less often than every 2-3 years / never
    DK / refused

15. What individuals, organizations, or other factors typically do, or would, cause changes in your firm's appraisal procedures? [PROMPT AS NEEDED:] Think about the last time your firm made a significant change in how it appraises tract homes. How did that come about, and what sources of information or influence were involved?

16. I'm going to read you a list of factors that might or might not be important in influencing changes in how your firm appraises homes – not changes in appraisal values, but in the ways that appraisals are developed. Please rate each one in terms of how important it is, using a 1 to 5 scale where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

    Changes in selling prices of comparable homes in local market ("comps") _____
    Changes in the home sales turnover rate _____
    Changes in borrower interest rates _____
    Changes in tax assessment values or rates _____
    Changes or differences in insurance loss rates associated with a

particular home characteristic (e.g., dwelling type, landscaping) _____
Changes or differences in home operating costs _____
Information in professional appraisal journals about new or different ways of appraising homes or the value of specific features _____

[Q'S 17/18 AND 19-22 EXCLUDED ON PURPOSE.]

18a. In past surveys we've found that some appraisers read publications like The Appraisal Journal, or The Real Estate Appraiser & Analyst, more often than others read them. How about you – would you say you regularly, often, sometimes, rarely, or never read appraisal publications like these?

Regularly
Often
Sometimes
Rarely
Or, never
DK/refused

ENERGY EFFICIENCY AND HOME APPRAISALS

23. (Just to check) Are your home appraisals designed to capture information about the home's energy efficiency or energy usage features or characteristics?

Yes (CONTINUE)
No (SKIP TO Q27)
DK/refused (SKIP TO Q27)

23a. What specific kinds of energy efficiency or energy usage information are provided in your appraisals? [RECORD BELOW UNDER Q23a COLUMN.]

23b. Do your appraisals typically provide information on [ASK FOR EACH LISTED ITEM NOT ALREADY MENTIONED AT Q23a.]? [RECORD ALL "YES" RESPONSES.]

	Q23a	Q23b
Overall home energy efficiency ratings	1	1
Degree/percent exceeded Title 24	2	2
HVAC SEER levels	3	3
Furnace AFUE levels	4	4
Insulation R-levels	5	5
Window efficiency ratings	6	6
Other: _____		8

[Q24 EXCLUDED ON PURPOSE.]

25. How important is the energy efficiency of a home in your overall appraisal? Would you say it is extremely important, very important, somewhat important, not very important, or not at all important?

Extremely important (CONTINUE)
Very important (CONTINUE)
Somewhat important (CONTINUE)
Not very important (SKIP TO Q27)
Not at all important (SKIP TO Q27)
DK/refused (SKIP TO Q27)

26. What difference does this energy efficiency information typically make in how you arrive at the appraised value of the home?

27. Have you read or heard any information indicating that energy-efficient homes sell at a premium to comparable homes without energy-efficient features?

Yes
No
DK/refused

28. Let's say you read or heard convincing evidence that energy-efficient homes do sell at a modest premium to comparable homes without energy-efficient features. What kind of an effect would that evidence have on how you appraise those kinds of homes? Please give me a rating from 1 to 5, where 1 means this evidence wouldn't have any effect at all on how you appraise homes, and a 5 means it would have a significant effect.

_____

28a. Why do you say that?

28b. Let's say that you noticed a local trend toward single family detached tract homes <u>with</u> energy-efficient features selling for a modest premium, versus comparable homes <u>without</u> these energy-efficient features. How many homes with energy-efficient features would you have to see sold at a modest premium, before you started to seriously consider energy efficiency as a factor in developing appraisals for similar homes?

[IF NEEDED:] How long would this trend have to go on before you started to seriously consider energy efficiency as a factor in developing appraisals for similar homes?

28c. What (else) would need to change or happen to cause you to (further) incorporate energy efficiency into your appraisals of single family detached tract homes?

PROGRAM AWARENESS / PERCEPTIONS / INTENTIONS

29. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those? [THEY MAY HAVE MENTIONED PROGRAM HOMES EARLIER.]

NO / NONE / DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q30)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

[ASK IN SCE / SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q29C:]
29b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE / SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q30)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK Q30 IF NOT AWARE OF ENERGY STAR HOMES PROGRAM AT Q29; OTHERWISE GO TO Q35:]
30. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages the use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[Q'S 31-34 EXCLUDED ON PURPOSE.]

TRAINING, CERTIFICATION, AND EEM'S

35. Are you aware of any energy efficiency training or information for home appraisers provided in your area in 1999?

Yes (CONTINUE)
No (SKIP TO Q41)
DK/refused (SKIP TO Q41)

36. Have you attended any of these training sessions or obtained any of this information in 1999? [IF YES, OBTAIN SPONSOR NAME.]

Yes (CONTINUE) [SPONSOR(S):] _____
No (SKIP TO Q38)
DK/refused (SKIP TO Q41)

37. How has this training/information affected the way you appraise single family detached tract homes, if at all?

[SKIP TO Q41]

38. Why have you chosen not to? Why else?

41. Before today, were you aware of any ratings systems that certify the energy efficiency of individual homes? [IF YES:] What is/are their names, and who sponsors them?

    CHEERS: _____
    HERO: _____
    HERS: _____
    Other mentions: _____
    None/DK/refused

42. Have you ever heard of energy efficiency mortgages for new homes? These are mortgages that take into account the reduced operating expenses, and increased available monthly cash flow, resulting from energy-efficient design and features.

    Yes (CONTINUE)
    No (SKIP TO Q44)
    DK/refused (SKIP TO Q44)

43. How often do <u>lenders</u> talk to you or ask you about energy efficiency mortgages? Would you say … [READ LIST]?

    Always,
    Often,
    Sometimes,
    Rarely,
    Or, never
    [DNR:] DK/refused

43a. How often do <u>homeowners or homebuyers</u> talk to you or ask you about energy efficiency mortgages? Would you say … [READ LIST]?

    Always,
    Often,
    Sometimes,
    Rarely,
    Or, never
    [DNR:] DK/refused

BARRIERS AND WRAP-UP

44. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from placing (more) emphasis on energy efficiency when appraising single family detached tract homes. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

    Increased hassle associated with collecting and using energy efficiency information _____
    Lack of information on how to evaluate the effects of specific energy-efficient home features on monthly cash flow savings _____
    Lack of a standard practice or software tool for factoring the ongoing operating costs of a home into its appraised value _____
    Lack of a certified energy efficiency rating from the utility or government _____
    Concern that features described as energy-efficient won't really save the homebuyer money each month _____
    Policies and procedures at your firm that hinder the consideration of energy efficiency in appraisals _____
    Lack of evidence that buyers value energy efficiency _____
    Lack of evidence that lenders value energy efficiency _____

45. Considering the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from placing (more) emphasis on energy efficiency when appraising single family detached tract homes?

46. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

Those are all the questions I have. Thank you very much for your time and your help.

Name _____

Company name _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.

VERIFY MAILING INFORMATION FOR INCENTIVE CHECK:

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2 / 22 / 00

STATEWIDE RNC
TITLE 24 CONSULTANTS SURVEY
FINAL

PG&E service territory……1
SCE/SCG service territory…. 2
SDG&E service territory…….3

INTRODUCTION/SCREENING

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes. Could I please speak to an individual who has a lot of experience in helping builders meet Title 24 energy code?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. We're offering $35 to the appropriate person at your firm to speak with us for about 15 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes.

We're interviewing a select group of energy consultants who have a lot of experience in helping builders of new tract homes comply with Title 24. Do you, or does someone else at your firm, have a lot of experience helping tract home builders meet Title 24?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. All your answers are held confidential, that is, we never link any information to a particular person or company.

Yes, respondent	[CONTINUE]
Yes, colleague	[ASK TO SPEAK WITH APPROPRIATE RESPONDENT]
No/DK/Refused	[TERMINATE]

We're offering $35 if you'll speak with us for about 15 minutes. Is now a good time?

Yes	[CONTINUE]
No/DK	[SET UP CALLBACK]
Refused	[TERMINATE]

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer.

ICEBREAKERS

1. How many different tract home developments did you or your firm work with in 1999? [TERMINATE IF ZERO; OTHERWISE CONTINUE.]

_____ Tract home builders in 1999

1a. How many tract home base models did you or your firm review in 1999, across this / these tract development(s)? [IF NEEDED:] Your best estimate is fine.

_____ Tract home base models reviewed in 1999

1b. About what percentage of the residential base models you or your firm reviewed in 1999 were for brand new, single family tract homes? [IF NECESSARY:] Your best estimate is fine.

_____% Brand new, single family tract homes

1c. How many years have you been a Title 24 consultant?

_____ Years as Title 24 consultant

1d. Do you work independently or as part of a company?

Independently (SKIP TO Q1C)
Part of company (CONTINUE)
DK / refused (CONTINUE)

1e. How many Title 24 consultants work at your company?

_____ Title 24 consultants in company

2. OK, for the rest of the survey we'll be talking about new, single family tract homes your firm reviewed plans for in 1999. About what percentage of the new, single family tract homes your firm reviewed plans for in 1999 were …[READ LIST]?

____% Under 2,000 square feet
____% 2,000 up to 3,000 square feet
____% 3,000 up to 4,000 square feet
____% 4,000 square feet or more
DK / refused

2a. Are the new single family tract homes you'll review in 1999 mostly in coastal areas, mostly inland, or a mix of coastal and inland locations? [IF NECESSARY, CLARIFY THAT "COASTAL" REFERS TO CLIMATE, NOT "OCEAN VIEW" / PREMIUM LOCATION.]

Mostly (exclusively) coastal
Mostly (exclusively) inland
Mix of coastal and inland

DK / refused

3. How do you currently report results of your Title 24 compliance review to builders? [PROBE AS NECESSARY:] What software do you use? Do you have a pass / fail checklist or do you estimate the percentage by which the design exceeds Title 24? Do you just report design performance, or do you also provide input on how the design can be improved? [THIS IS A KEY QUESTION; PROBE FOR AS MUCH DETAIL AS THEY CAN PROVIDE.]

3a. Do you report results of your Title 24 compliance reviews differently, or otherwise work differently, with different tract homebuilders?

Yes (CONTINUE)
No (SKIP TO Q4)
DK / refused (SKIP TO Q4)

3b. Please describe the ways that your reporting or work process differs across builders.

[ASK IF NOT ALREADY CLEAR FROM Q3B RESPONSES:]
3c. What are the main reasons for these differences?

4. Have there been any changes over the last year or two in the ways that you work with tract homebuilders or report Title 24 compliance reviews to them? [IF YES:] What have those changes been, and what has caused them?

BUYER INTEREST IN/EXPOSURE TO ENERGY EFFICIENCY

5. Based on your experience, what do you believe are the features in a new tract home that contribute the most to energy efficiency? [DO NOT READ; CIRCLE ALL; PUT CHECK MARK BY FIRST MENTION. **PROBE FOR E.E. CRITERIA**.]

E.E. CRITERIA

Air conditioner / HVAC (high-efficiency)
Appliances (washer, dryer, range)
Clock thermostat
Construction type (e.g., 2X6 studs)
Daylighting / skylighting
Ducts – tight ducts, insulated ducts
Fans (attic, whole-house)
Furnace / heating system
Glazing area (ratio of glass to total wall area)
Heating fuel choice: _____
Heat pump
Insulation (roof)
Insulation (wall)
Insulation (doors / windows)
Insulation (hot water pipes)
Insulation – other: _____
Lighting
Multiple zones
Shade trees / tree orientation
Soffit vents
Water heater
Whole-house design
Windows (non-specific)
Windows (double / triple panes)
Windows (gas-filled – argon, krypton)
Windows (low-e, low-emissivity)
Other: _____
DK / None

6. Based on your experience or what you've seen or heard, how much demand do you perceive there to be **in general** for tract homes that exceed Title 24, among buyers of new single family tract homes? [READ LIST]

A lot (CONTINUE)
Some (CONTINUE)
Little (CONTINUE)
Very little (CONTINUE)
Or, none (CONTINUE)
[DO NOT READ:] Don't know / don't have much direct buyer contact / refused

7. How regularly do you promote designs that exceed Title 24 to builders or developers of new tract homes? Would you say…[READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK/refused

8. And, how often do builders or developers of new tract homes ask for your input on how to exceed Title 24 in tract home designs? Would you say…[READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK/refused

RNC / ENERGY STAR PROGRAM AWARENESS / PARTICIPATION / PERCEPTIONS / INTENTIONS

9. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those?

NO/NONE/DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q9; IF COMFORT HOME ALREADY MENTIONED, GO TO Q10A.]
9a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q10a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK IN SCE/SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q9C.]
9b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE/SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q9; IF ENERGY ADVANTAGE ALREADY MENTIONED, FOLLOW Q9C "YES" LOGIC.]
9c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q12a IF NOT)
No (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)
Don't know (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q13A.]
9d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q13a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK Q10a IF AWARE OF **PG&E COMFORT HOME**; OTHERWISE GO TO Q14.]
10a. As far as you know, in 1999 has your firm reviewed designs for any new tract homes that have been, or will be, built under the PG&E Comfort Home Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

10b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] In how many tract developments have you reviewed program home designs in 1999?

10c. How many program base models have you reviewed in 1999?

____ Base models

10d. And, how did the design approach for these program homes differ from the design approach for typical new tract homes, if at all?

10e. What changes, if any, have you made in your approach to working with tract home builders, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
10f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

10g. Why/why not? Why else do you say that?

[ASK Q11a IF AWARE OF **SCE COMFORTWISE**; OTHERWISE GO TO Q12a.]
11a. As far as you know, in 1999 has your firm reviewed designs for any new tract homes that have been, or will be, built under the Southern California Edison ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q12a)
Don't know (SKIP TO Q12a)

11b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] In how many tract developments have you reviewed program home designs in 1999?

11c. How many program base models have you reviewed in 1999?

____ Base models

11d. And, how did the design approach for these program homes differ from the design approach for typical new tract homes, if at all?

11e. What changes, if any, have you made in your approach to working with tract home builders, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
11f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

11g. Why/why not? Why else do you say that?

[ASK Q12a IF AWARE OF **SOCALGAS ENERGY ADVANTAGE**; OTHERWISE GO TO Q14.]

12a. As far as you know, in 1999 has your firm reviewed designs for any new tract homes that have been, or will be, built under the Southern California Gas Energy Advantage Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

12b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] In how many tract developments have you reviewed program home designs in 1999?

12c. How many program base models have you reviewed in 1999?

____ Base models

12d. And, how did the design approach for these program homes differ from the design approach for typical new tract homes, if at all?

12e. What changes, if any, have you made in your approach to working with tract home builders, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]

12f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

12g. Why/why not? Why else do you say that?

[ASK Q13a IF AWARE OF **SDG&E COMFORTWISE**; OTHERWISE GO TO Q14.]
13a. As far as you know, in 1999 has your firm reviewed designs for any new tract homes that have been, or will be, built under the SDG&E ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

13b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] In how many tract developments have you reviewed program home designs in 1999?

13c. How many program base models have you reviewed in 1999?

____ Base models

13d. And, how did the design approach for these program homes differ from the design approach for typical new tract homes, if at all?

13e. What changes, if any, have you made in your approach to working with tract home builders, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
13f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

13g. Why/why not? Why else do you say that?

[ASK IF DOES NOT VOLUNTEER AWARENESS OF ENERGY STAR HOMES PROGRAM AT
Q9, OTHERWISE GO TO Q14a:]

14. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (SKIP TO Q15)
Don't know (SKIP TO Q15)

14a. As far as you know, in 1999 has your firm reviewed designs for any new tract homes that have been, or will be, built under the Energy Star Homes Program?

Yes (CONTINUE)
No (SKIP TO Q15)
Don't know (SKIP TO Q15)

14b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] In how many tract developments have you reviewed program home designs in 1999?

14c. How many program base models have you reviewed in 1999?

____ Base models

14d. And, how did the design approach for these program homes differ from the design approach for typical new tract homes, if at all?

14e. What changes, if any, have you made in your approach to working with tract home builders, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]

14f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

14g. Why / why not? Why else do you say that?

EXCEEDING TITLE 24

15. In 1999, did your firm review designs for any tract homes that intentionally exceed Title 24, but are not part of one of the programs I asked about earlier? That is, homes where special design and construction practices aren't directly supported by incentive dollars or program marketing and advertising, but are more energy-efficient than required by code.

    Yes (CONTINUE)
    No (SKIP TO Q22)
    DK/Refused (SKIP TO Q38)

16. What percentage of the tract home designs your firm reviewed in 1999 intentionally exceeded Title 24 (without any energy efficiency program support)? Your best estimate is fine.

    _____ %

17. What reasons or factors determine whether or not a particular tract home or development intentionally exceeds Title 24 (without any energy efficiency program support)? What other reasons or factors?

18. Overall, how influential would you say Title 24 consultants are in determining whether a tract home intentionally exceeds Title 24 standards? Would you say … [READ LIST]?

    Extremely influential
    Very influential
    Somewhat influential
    Not very influential, or
    Not at all influential
    [DNR:] DK/refused

18a. Why do you say that?

19. And, how influential would you say Title 24 consultants are in determining how a tract home exceeds Title 24 standards? Would you say … [READ LIST]?

    Extremely influential
    Very influential
    Somewhat influential
    Not very influential, or
    Not at all influential
    [DNR:] DK/refused

19a. Why do you say that?

20. For tract home designs your firm reviewed in 1999 that intentionally exceeded Title 24, what energy-efficient design or construction practices, equipment, or features were most often used to exceed Title 24?

21. How have tract home methods for exceeding Title 24 changed over the past year or two, if at all? Why do you think those changes have occurred?

[SKIP TO Q38.]

22. What is the main reason your firm didn't review any tract home designs that exceed Title 24 in 1999 (other than those built as part of a program)? Why else?

[Q23-37 SKIPPED ON PURPOSE.]

BARRIERS, PERCEPTIONS, AND INTENTIONS

38. I'm going to read you a series of brief phrases. Please rate each one in terms of how important you think it is in preventing builders and developers from building and selling more tract homes that exceed Title 24. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

Increased home cost associated with including energy-saving features _____
Lack of information on how to incorporate energy efficiency in new homes _____
Lack of financing for homebuyers that factors in energy savings _____
Concern that the specific features won't save as much as buyers expect _____
Not enough specific options for saving energy _____
Difficulty in choosing among options for saving energy _____
Supply and availability problems with energy-saving products _____
The hassles involved in providing energy-saving options _____
Company policies and procedures that hinder the use of energy-efficient designs _____
Tradeoffs in other aspects of home design required by energy-efficient features _____
Lack of homebuyer willingness to pay for energy efficiency _____
Problems finding and coordinating contractors who understand energy efficiency_____

39. Given the kinds of factors I just asked about, what other factors, if any, are important in preventing the building and selling of more tract homes that exceed Title 24?

40. Please think about everything you've experienced, seen, or heard about energy-saving measures in new homes, as well as buyer willingness to pay for new homes. On that basis, over the next 2 or 3 years would you expect the proportion of new tract homes that exceed Title 24 to increase, decrease, or stay the same? This would exclude any utility or other energy efficiency programs.

    Increase
    Decrease
    Stay the same
    DK / refused

41. What changes, if any, do you think are likely in terms of the ways that you'll address energy efficiency issues when reviewing tract home designs, over the next 2 or 3 years?

TRAINING / INFORMATION SOURCES / WRAP-UP

42. If you want to learn more about energy-saving design practices or home features, what resources would you go to for help and information? What others?

43. Are you aware of any training on energy efficiency provided by California-based utilities in 1999?

    Yes
    No (SKIP TO Q48)
    Don't know / refused (SKIP TO Q48)

43a. Who was the sponsor or sponsors of this training? [RECORD ALL MENTIONS]

    PG&E
    SCE
    SoCalGas
    SDG&E
    Other: _____
    DK / refused

44. Have you attended any of these training sessions this year? [RECORD ALL MENTIONS]

Yes, PG&E
Yes, SCE
Yes, SoCalGas
Yes, SDG&E
Yes, other: _____
No (SKIP TO Q48)
Don't know / refused (SKIP TO Q48)

45. How has this training affected the way you review tract home designs, if at all? [IF NECESSARY, DISTINGUISH BETWEEN TRAINING SPONSORED BY SPECIFIC UTILITIES.]

[QUESTIONS 46-47 SKIPPED ON PURPOSE.]

48. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.

VERIFY MAILING INFORMATION FOR INCENTIVE CHECK:

RNC_Title 24_FINAL Quex.doc
2 / 22 / 00

STATEWIDE RNC
HVAC CONTRACTOR SURVEY
FINAL

PG&E service territory……. 1
SCE/SCG service territory.. 2
SDG&E service territory….. 3

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes. Could I please speak to the person responsible for design or equipment decisions and recommendations for new tract homes? [IF VOLUNTEERS NO NEW TRACT HOME WORK, OR NO RESIDENTIAL WORK, TERMINATE.]

[IF NECESSARY:] This survey is extremely important to the Board's understanding of HVAC equipment in the new construction market. We're offering $35 to the appropriate person at your firm to speak with us for 15 to 20 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes. Can I confirm that you're the person responsible for making design or equipment decisions and recommendations for new tract homes?

Yes	[CONTINUE]
No/DK	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]
Refused	[TERMINATE]

[IF NECESSARY:]
This survey is extremely important to the Board's understanding of HVAC equipment in the new construction market. We're offering $35 if you'll spend 15 to 20 minutes sharing with us your insights about the market for energy-saving features in new homes. All your answers are held confidential, that is, we never link any information to a particular person or company. Is now a good time?

Yes	[CONTINUE]
No	[SET UP CALLBACK]
DK/refused	[TERMINATE]

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer. A "custom" home is defined as a home designed and built for a particular customer. Also, when I refer to HVAC systems I'm also generally referring to ductwork as well.

ICEBREAKER AND "MINIMAL BIAS" DESCRIPTIVE QUESTIONS

1. How many years have you been a residential HVAC contractor? ____ Years

2. In about how many new single-family homes will your firm install HVAC equipment in 1999? Your best estimate is fine.

   ____ New homes [SHOULD BE AT LEAST 50 TO CONTINUE; OTHERWISE TERMINATE]

3. Thinking about your HVAC installations in new single family homes in 1999, what percent fall into each of the following categories? Again, your best estimate is fine.

   _____% New tract homes [MUST BE AT LEAST 25% TO CONTINUE]
   _____% New custom homes
   _____% Existing homes (new or custom)
   100%

3a. With how many builders will you install HVAC equipment in new single family tract homes in 1999?

   _____ Builders – 1999 SFD tract homes

4. Still thinking about your firm's HVAC installations in new single family tract homes in 1999, about what percentage of the homes are in each of the following categories...[READ LIST]? [IF NECESSARY:] Again, your best estimate is fine.

   ____% Under 2,000 square feet
   ____% 2,000 up to 3,000 square feet
   ____% 3,000 up to 4,000 square feet
   ____% 4,000 square feet or more

4a. In what percentage of new, single family tract home will you install more than one furnace or boiler, or more than one air conditioning compressor?

   ____% Multiple equipment/zones

"From here on, when I refer to new tract homes, I'm talking about new single family tract homes."

5. How do you go about sizing and selecting the central air conditioner for a new tract home? [PROBE FOR USE OF SOFTWARE AND WHICH ONE(S) USED, IF NOT MENTIONED.]

5a. Over the past couple of years, has your firm made any changes in its approach to sizing, installing, or testing HVAC equipment or ductwork for new tract homes?

Yes (CONTINUE)
No (SKIP TO Q6)
DK / refused (SKIP TO Q6)

5b. Can you please describe those changes.

5c. What was the main reason you made those changes? What were any other reasons?

6. Let's say that to meet a particular home's potential cooling needs, you know that at a minimum you need a certain size system. How much of a safety margin, if any, do you recommend or allow beyond that minimum? If possible, please provide your response in terms of the percentage increase beyond the minimum acceptable size.

_____ %

7. Now I'm going to ask you about four different decisions related to the selection and installation of HVAC systems in new tract homes. For each one I'll ask you how often these decisions are made by your firm, by the builder, possibly by the buyer, or based on Title 24 code. In situations where the final decision is up to the builder, but you've actually made the recommendation and they've simply followed it, think of that as your firm making the decision.

The first one is the equipment's rated efficiency level – does your firm always, often, sometimes, rarely, or never make that decision? [ASK FOR REMAINING FACTORS, OBTAINING "ALWAYS," "OFTEN," "SOMETIMES," "RARELY," OR "NEVER." THEN ASK FOR ALL FACTORS FOR EACH REMAINING DECISION.]

[RECORD RESPONSES WITH THIS SCALE:]

Always	5
Often	4
Sometimes	3
Rarely	2
Never	1

	---------- FACTORS ---------			
	HVAC Firm	**Build-der**	**Buyer**	**Title 24**
The equipment's rated efficiency level	___	___	___	___
The system design	___	___	___	___
Different duct installation methods	___	___	___	___
A particular R-value of duct insulation	___	___	___	___

7a. [ASK FOR EACH Q7 ITEM:] Over the last year or two, have you noticed any changes in how decisions get made regarding [ITEM]? [IF YES:] What have those changes been? [REFER BACK TO Q7 "GRID" AS NEEDED TO ORIENT Q7a RESPONSES.]

[ASK FOR EACH ITEM WHERE CHANGES NOTED, BEFORE GOING TO NEXT ITEM:] What are the factors behind that shift in decision-making for [ITEM]? What are some other factors?

7b. How do you typically define energy-efficient or high-efficiency HVAC systems, in terms of design, equipment, installation practices, and/or testing?

7c. Based on your definition, how often do you factor in energy efficiency when you are recommending HVAC systems for new tract homes? Would you say … {READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK/refused

8a. What percentage of the HVAC systems you'll install in new tract homes in 1999 will be 10 SEER or less, what percent 10 to 12 SEER, and what percent 13 SEER or higher?

____ % 10 SEER or less
____ % 10-12 SEER
____ % 13+ SEER
100%

[SKIP TO Q8d IF INCOMPLETE/REFUSED AT Q8a:]
8b. In the past couple of years, have any of these percentages increased or decreased significantly? [IF YES:] How have these percentages shifted across SEER categories? [IF ONE INCREASES THEN AT LEAST ONE OTHER MUST DECREASE, AND VICE-VERSA.]

8c. [ASK IF SHIFTS REPORTED IN 8b:] What factors are behind that shift? What others?

8d. What percentage of the gas furnaces you'll install in new tract homes in 1999 will be rated below 80% AFUE, what percentage will be rated 80 to 89% AFUE, and what percentage will be rated 90% AFUE or higher?

____ % Under 80% AFUE
____ % 80-89% AFUE
____ % 90% or higher AFUE
100%

[SKIP TO Q9 IF INCOMPLETE/REFUSED AT Q8d:]
8e. In the past couple of years, have any of these percentages increased or decreased significantly? [IF YES:] How have these percentages shifted across AFUE categories? [IF ONE INCREASES THEN AT LEAST ONE OTHER MUST DECREASE, AND VICE-VERSA.]

8f. [ASK IF SHIFTS REPORTED IN 8e:] What factors are behind that shift? What others?

PROGRAM AWARENESS / PARTICIPATION / PERCEPTIONS / INTENTIONS

9. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those?

NO/NONE/DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q9; IF COMFORT HOME ALREADY MENTIONED, SKIP TO Q10:]
9a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q10a)
No (SKIP TO Q14)

Don't know (SKIP TO Q14)

[ASK IN SCE/SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, SKIP TO Q9C:]
9b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE/SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q9; IF ENERGY ADVANTAGE ALREADY MENTIONED, FOLLOW Q9C "YES" LOGIC BELOW:]
9c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q12a IF NOT)
No (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)
Don't know (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, SKIP TO Q13a:]
9d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q13a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK Q10a IF AWARE OF **PG&E COMFORT HOME**; OTHERWISE GO TO Q14.]
10a. In 1999, has your firm installed HVAC systems in any new tract homes built under the PG&E Comfort Home Program?

Yes (CONTINUE)
No (SKIP TO Q10d)
Don't know (SKIP TO Q10d)

10b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you installed HVAC equipment in program homes, in 1999?

10c. In about how many program homes have you installed HVAC equipment, in 1999?

____ Homes

10d. Did your firm install HVAC equipment in program homes before 1999?

Yes (CONTINUE)
No (SKIP TO Q10f)
Don't know (SKIP TO Q10f)

10e. In about how many program homes did you install HVAC equipment, before 1999?

____ Homes

10f. How would you summarize the 1999 program participation requirements, if any, affecting
HVAC system design, installation, equipment, or testing?

10g. And, how did your involvement in these program homes differ from your typical new tract home installations, in terms of activities you were involved in, and/or interactions with the builder or other subcontractors?

10h. Assuming the program is essentially unchanged next year, would you say that your firm
will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to

pursue work in program homes next year?

Extremely likely
Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

10i. Why do you say that? Why else? [PROBE PROGRAM PARTICIPANTS FOR DRIVERS OF DIS/SATISFACTION WITH PROGRAM EXPERIENCE.]

10j. [PROGRAM INSTALLERS ONLY:] What percent of all new, single family tract homes you'll work on in 1999 will be program homes?

_____ % Program homes

[PROGRAM INSTALLERS REPORTING LESS THAN 100% AT 10J ONLY:]
10k. What changes, if any, has your company made in its general HVAC system design, installation, or equipment, or testing practices or recommendations in <u>non-program</u> homes, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
10l. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

10m. Why/why not? Why else do you say that?

[ASK Q11a IF AWARE OF **SCE COMFORTWISE**; OTHERWISE GO TO Q12a.]
11a. Has your company participated in the Southern California Edison ComfortWise Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q11B.]

Yes (CONTINUE)
No (SKIP TO Q11d)
Don't know (SKIP TO Q11d)

11b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you installed HVAC equipment in program homes, in 1999?

11c. In about how many program homes have you installed HVAC equipment, in 1999?

____ Homes

11d. Did your firm install HVAC equipment in program homes before 1999?

Yes (CONTINUE)
No (SKIP TO Q11f)
Don't know (SKIP TO Q11f)

11e. In about how many program homes did you install HVAC equipment, before 1999?

____ Homes

11f. How would you summarize the 1999 program participation requirements, if any, affecting
HVAC system design, installation, equipment, or testing?

11g. And, how did your involvement in these program homes differ from your typical new tract home installations, in terms of activities you were involved in, and/or interactions with the builder or other subcontractors?

11h. Assuming the program is essentially unchanged next year, would you say that your firm

will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to pursue work in program homes next year?

Extremely likely
Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

11i. Why do you say that? Why else? [PROBE PROGRAM PARTICIPANTS FOR DRIVERS OF DIS/SATISFACTION WITH PROGRAM EXPERIENCE.]

11j. [PROGRAM INSTALLERS ONLY:] What percent of all new, single family tract homes you'll work on in 1999 will be program homes?

_____ % Program homes

[PROGRAM INSTALLERS REPORTING LESS THAN 100% AT 11J ONLY:]
11k. What changes, if any, has your company made in its general HVAC system design, installation, or equipment, or testing practices or recommendations in <u>non-program</u> homes, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
11l. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

11m. Why/why not? Why else do you say that?

[ASK Q12a IF AWARE OF **SOCALGAS ENERGY ADVANTAGE**; OTHERWISE GO TO Q14.]

12a. Has your company participated in the SoCalGas Energy Advantage Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q12B.]

Yes (CONTINUE)
No (SKIP TO Q12d)
Don't know (SKIP TO Q12d)

12b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you installed HVAC equipment in program homes, in 1999?

12c. In about how many program homes have you installed HVAC equipment, in 1999?

____ Homes

12d. Did your firm install HVAC equipment in program homes before 1999?

Yes (CONTINUE)
No (SKIP TO Q12f)
Don't know (SKIP TO Q12f)

12e. In about how many program homes did you install HVAC equipment, before 1999?

____ Homes

12f. How would you summarize the 1999 program participation requirements, if any, affecting HVAC system design, installation, equipment, or testing?

12g. And, how did your involvement in these program homes differ from your typical new tract home installations, in terms of activities you were involved in, and/or interactions with the builder or other subcontractors?

12h. Assuming the program is essentially unchanged next year, would you say that your

firm
will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to pursue work in program homes next year?

Extremely likely
Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

12i. Why do you say that? Why else? [PROBE PROGRAM PARTICIPANTS FOR DRIVERS OF DIS/SATISFACTION WITH PROGRAM EXPERIENCE.]

12j. [PROGRAM INSTALLERS ONLY:] What percent of all new, single family tract homes you'll work on in 1999 will be program homes?

_____ % Program homes

[PROGRAM INSTALLERS REPORTING LESS THAN 100% AT 12J ONLY:]
12k. What changes, if any, has your company made in its general HVAC system design, installation, or equipment, or testing practices or recommendations in <u>non-program</u> homes, as a
result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
12l. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

12m. Why/why not? Why else do you say that?

[ASK Q13a IF AWARE OF **SDG&E COMFORTWISE**; OTHERWISE GO TO Q14.]
13a. Has your company participated in the SDG&E ComfortWise Program during 1999? [FOR PARTICIPANTS, CIRCLE YES AND CONTINUE WITH Q13B.]

Yes (CONTINUE)
No (SKIP TO Q13d)
Don't know (SKIP TO Q13d)

13b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you installed HVAC equipment in program homes, in 1999?

13c. In about how many program homes have you installed HVAC equipment, in 1999?

____ Homes

13d. Did your firm install HVAC equipment in program homes before 1999?

Yes (CONTINUE)
No (SKIP TO Q13f)
Don't know (SKIP TO Q13f)

13e. In about how many program homes did you install HVAC equipment, before 1999?

____ Homes

13f. How would you summarize the 1999 program participation requirements, if any, affecting
HVAC system design, installation, equipment, or testing?

13g. And, how did your involvement in these program homes differ from your typical new tract home installations, in terms of activities you were involved in, and/or interactions with the builder or other subcontractors?

13h. Assuming the program is essentially unchanged next year, would you say that your firm

will be extremely likely, very likely, somewhat likely, not very likely, or not at all likely to pursue work in program homes next year?

Extremely likely
Very likely
Somewhat likely
Not very likely
Not at all likely
DK/refused

13i. Why do you say that? Why else? [PROBE PROGRAM PARTICIPANTS FOR DRIVERS OF DIS/SATISFACTION WITH PROGRAM EXPERIENCE.]

13j. [PROGRAM INSTALLERS ONLY:] What percent of all new, single family tract homes you'll work on in 1999 will be program homes?

_____ % Program homes

[PROGRAM INSTALLERS REPORTING LESS THAN 100% AT 13J ONLY:]
13k. What changes, if any, has your company made in its general HVAC system design, installation, or equipment, or testing practices or recommendations in <u>non-program</u> homes, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME <u>CHANGES</u> AS A RESULT OF PROGRAM(S):]
13l. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

13m. Why/why not? Why else do you say that?

[ASK IF NOT AWARE OF ENERGY STAR HOMES PROGRAM AT Q9, OTHERWISE GO TO Q14a:]

14. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages use of energy-efficient practices and features in new home construction?

    Yes (CONTINUE)
    No (SKIP TO Q15)
    Don't know (SKIP TO Q15)

14a. Has your firm installed HVAC equipment in any homes that qualified under the Energy Star Homes Program during 1999?

    Yes (CONTINUE)
    No (SKIP TO Q15)
    Don't know (SKIP TO Q15)

14b. In about how many Energy Star program homes will you install HVAC equipment in 1999?

    ____ Program homes in 1999

14c. How would you summarize the 1999 Energy Star Homes Program participation requirements, if any, affecting HVAC system design, installation, equipment, or testing?

ADDITIONAL KNOWLEDGE OF ENERGY-EFFICIENT DESIGN AND INSTALLATION

15. Outside of homes that are part of a utility program, how often do builders of new tract homes actively solicit your input and involvement in helping them meet Title 24 code? Would you say … [READ LIST]?

    Always, (CONTINUE)
    Often, (CONTINUE)
    Sometimes, (CONTINUE)
    Rarely, or (SKIP TO Q17)
    Never (SKIP TO Q17)
    [DNR:] DK/refused (SKIP TO Q17)

16. What kinds of changes in your HVAC system design, equipment, installation, or testing are typically involved in these situations?

17. Outside of homes that are part of a utility program, how often do builders of new tract homes actively solicit your input and involvement in helping them exceed Title 24 code? Would you say … [READ LIST]?

Always, (CONTINUE)
Often, (CONTINUE)
Sometimes, (CONTINUE)
Rarely, or (SKIP TO Q19)
Never (SKIP TO Q19)
[DNR:] DK/refused (SKIP TO Q19)

18. What kinds of changes in your HVAC system design, equipment, installation, or testing are typically involved in these situations? [ANTICIPATE THE RESPONSE MAY BE "THE SAME AS BEFORE."]

19. In the future, how likely will you to be to specify or recommend high-efficiency HVAC system design, installation, equipment, or testing in new tract homes, in the absence of builder specification or utility programs? Will you be… [READ LIST]?

    Extremely likely,
    Very likely,
    Somewhat likely,
    Not very likely, or
    Not at all likely
    [DNR:] DK/refused

20. Why do you say that? Why else? [PROBE FOR HOW CLIMATE ZONE AFFECTS THEIR APPROACH, IF NOT MENTIONED.]

21. What are the other features of new tract homes that most often affect the final energy efficiency of the HVAC system? [PROMPT ONLY IF NEEDED:] This might include, for example, windows, insulation, shade tree planting, or other aspects of the home.

22. [IF MORE THAN ONE FEATURE AT Q21:] Which has greatest effect?

23. How, if at all, is the sizing of the HVAC system balanced against other home features that may affect the cooling load, and system performance from room to room? [PROMPT ONLY IF NEEDED:] This might include, for example, windows, insulation, shade tree planting, or other aspects of the home.

24. Has the way this "balancing" is done changed over the last couple of years, in your experience? [IF YES:] In what ways? How else?

TRAINING

25. Have you or has your staff received any training in the proper installation of high-efficiency HVAC equipment, or duct system design and testing?

    Yes (CONTINUE)
    No (SKIP TO Q26)
    DK / refused (SKIP TO Q26)

25a. From whom did you receive that training, and when?

From whom:	When:
PG&E	_____
SCE	_____
SoCalGas	_____
SDG&E	_____
Other: _____	_____

25b. How has this training changed your business practices, if at all, in terms of HVAC and/or ductwork design, installation, equipment, or testing? [GET SCE/SCG BREAKDOWN WHERE RELEVANT]

26. Are you aware of any (other) utility-sponsored training this year in your area regarding high-efficiency HVAC or duct system design, equipment, installation, or testing?

Yes (CONTINUE)
No (SKIP TO Q29)
DK/refused (SKIP TO Q29)

26a. (Just to check), In 1999, have you attended any of these utility-sponsored training sessions, either at a home site or development, a utility facility, or some other place?

Yes (CONTINUE)
No (SKIP TO Q28b)
DK/refused (SKIP TO Q28b)

26b. How many utility-sponsored training sessions have you attended in 1999?

____ Utility-sponsored training sessions in 1999 [GET SCE/SCG BREAKDOWN]

25. What was the focus or purpose of [this/these] training session(s), from your perspective? [AGAIN SCE/SCG BREAKDOWN WHERE RELEVANT]

[IF DIFFERENT FROM WHAT WAS DESCRIBED AT Q25B:]
28a. How has this utility-sponsored training changed your business practices, if at all, in terms of HVAC and/or ductwork design, installation, equipment, or testing? [AGAIN, SCE/SCG BREAKDOWN WHERE RELEVANT]

[GO TO Q29.]

28b. Why have you chosen not to attend utility-sponsored training sessions this year? Why else?

29. In what (other) areas relating to residential energy efficiency would you most like to see training provided by your utility company?

PERCEIVED HOMEBUYER CHARACTERISTICS/PREFERENCES

30. Would you say home buyer demand for energy-saving features has increased, decreased, or stayed the same over the last 5 years?

Increased (CONTINUE)
Decreased (CONTINUE)
Stayed same (CONTINUE)
DK/refused (GO TO Q32)

31a. Why do you think that is?

32. In your opinion, do buyers expect all newer homes, say 5 years old or less, to be built to save energy?

Yes
No
Don't know

[Q'S 33-37 SKIPPED ON PURPOSE.]

BARRIERS, PERCEPTIONS, AND INTENTIONS

38. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from installing more energy-efficient HVAC systems than you typically do now. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

Increased HVAC system cost associated with energy savings _____
Lack of homebuyer willingness to pay for energy efficiency _____
Lack of information on how HVAC system efficiency impacts other energy-using home features, and vice-versa
_____
Lack of information on how to increase HVAC and duct efficiency
_____
Concern that the HVAC system won't save as much as buyers expect _____
Problems coordinating with other subcontractors whose work affects HVAC efficiency (e.g., windows, insulation)
_____ Builder policies and procedures that hinder the use of energy-efficient designs (e.g., inadequate space for good duct design) _____
Concern about the reliability of different equipment or system designs, and increased potential for callbacks
_____

39. Based on the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from installing more energy-efficient HVAC systems?

[Q40 SKIPPED ON PURPOSE.]

41. Please think about everything you've experienced, seen, or heard about energy-saving measures in new homes, as well as buyer willingness to pay for new homes. On that basis, over the next 2 or 3 years would you expect the proportion of your new tract home installations that exceed minimum energy efficiency codes to … [READ LIST]? This would exclude any utility or other energy efficiency program sponsorship.

Increase (CONTINUE)
Decrease (CONTINUE)
Or, stay the same (SKIP TO Q42a)
[DNR:] DK / refused (SKIP TO Q42a)

42. What percentage (increase / decrease) do you expect in your volume of <u>non-program</u> tract home installations exceeding code in the next 2 or 3 years?

_____ % Increase / decrease in volume of EE non-program installations

42a. What changes, if any, do you think are likely in terms of the ways that you'll address energy efficiency issues in tract homes over the next 2 or 3 years?

[Q'S 43-47 SKIPPED ON PURPOSE.]

WRAP-UP

48. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

Name _____

Company name _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.

VERIFY MAILING INFORMATION FOR INCENTIVE CHECK:

RNC_HVAC_FINAL Quex.doc
2 / 22 / 00

STATEWIDE RNC
SALES AGENT/REALTOR SURVEY
FINAL

PG&E service territory……1
SCE/SCG service territory…. 2
SDG&E service territory…….3

INTRODUCTION/SCREENING

Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes. Could I please speak to [CONTACT PROVIDED BY BUILDER, OR:] a realtor who has a lot of experience in marketing and selling new tract homes?

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. We're offering $35 to [contact / the appropriate person at your firm] to speak with us for about 15 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the market for energy-saving features in new tract homes.

You're one of a select group of realtors we're interviewing who have a lot of experience in selling new tract homes. We're offering $35 if you'll speak with us for about 15 minutes.
Is now a good time?

Yes [CONTINUE]
No/DK [SET UP CALLBACK]
Refused [TERMINATE]
Not experienced in selling new tract homes [ASK TO SPEAK WITH APPROPRIATE INDIVIDUAL]

[IF NECESSARY:] This survey is extremely important to the Board's understanding of the new construction market. All your answers are held confidential, that is, we never link any information to a particular person or company. You were suggested as a good contact for this survey after we interviewed [BUILDER] as part of this same study.

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer.

1. How many years have you been a realtor? _____ Years as a realtor

1a. About how many single family homes will you sell in 1999?

____ SFD homes

1b. About what percentage of the single family homes you'll sell in 1999 are brand new tract homes? [IF NECESSARY:] Your best estimate is fine.

_____% Brand new tract homes [TERMINATE IF LESS THAN 10%]

2. About what percentage of the new, single family tract homes you'll sell in 1999 are … [READ LIST]?

____% Under 2,000 square feet
____% 2,000 up to 3,000 square feet
____% 3,000 up to 4,000 square feet
____% 4,000 square feet or more
DK/refused

3. About what percentage of the new single family tract homes you'll sell in 1999 are...[READ LIST]?

____% Under $100,000
____% $100,000 to $200,000
____% $200,000 to $300,000
____% $300,000 to $500,000
____% Over $500,000
DK/refused

4. Are the new single family tract homes you'll sell in 1999 mostly in coastal areas, mostly inland, or a mix of coastal and inland locations? [IF NECESSARY, CLARIFY THAT "COASTAL" REFERS TO CLIMATES, NOT "OCEAN VIEW"/PREMIUM LOCATION.]

Mostly (exclusively) coastal
Mostly (exclusively) inland
Mix of coastal and inland
DK/refused

[ASK Q4A IF SALES AGENT WORKS FOR DIFFERENT FIRM THAN REFERRING BUILDER, BASED ON SAMPLE INFORMATION; OTHERWISE, GO TO Q4D.]
4a. [Just to check,] Do you have any agreements with builders of tract home developments in 1999, where your firm is the sole sales agent for the development?

Yes (CONTINUE)
No (SKIP TO Q5)
DK/refused (SKIP TO Q5)

4b. About how many homes will <u>you, yourself</u>, sell in new tract developments where your firm is the sole sales agent, during 1999?

_____ Homes sold where firm is sole sales agent

4c. And, for how many tract home builders or developers will <u>your firm</u> be the sole sales agent in 1999? [THIS IS FIRMS, NOT DEVELOPMENTS]

_____ Builders / developers for whom firm is sole sales agent

[GO TO Q5]

[ASK Q4D ONLY IF RESPONDENT WORKS FOR REFERRING BUILDER:]
4d. Just to check, your firm or work group is actually part of [REFERRING BUILDER]?

Yes (CONTINUE)
No (CLARIFY CONNECTION TO REFERRING BUILDER AS NEEDED)
DK / refused (CONTINUE)

<u>BUYER INTEREST IN/EXPOSURE TO ENERGY EFFICIENCY</u>

5. OK, just to confirm, for the rest of the survey we'll be talking about new single family tract homes and homebuyers in 1999. When you are working with a buyer, what home features or characteristics do they usually mention wanting?

5a. Of those, which one do buyers <u>most often</u> mention?

6. Based on your experience, how much demand is there **<u>in general</u>** from homebuyers for energy-saving features? [READ LIST]

A lot
Some
Little
Very little
Or, none (SKIP TO Q7)
[DO NOT READ:] Don't know / refused (SKIP to Q7)

6a. And based on your experience, what energy saving home features do buyers look for, if any? [DO NOT READ; CIRCLE ALL; PUT CHECK MARK BY FIRST MENTION.]

Air conditioner / HVAC (high-efficiency)
Appliances (washer, dryer, range)
Clock thermostat
Construction type (e.g., 2X6 studs)
Daylighting / skylighting
Ducts – tight ducts, insulated ducts
Fans (attic, whole-house)
Furnace / heating system
Glazing area (ratio of glass to total wall area)
Heating fuel choice: _____
Heat pump
Insulation (roof)
Insulation (wall)
Insulation (doors / windows)
Insulation (hot water pipes)
Insulation – other: _____
Lighting
Multiple zones
Shade trees / tree orientation
Soffit vents
Water heater
Whole-house design
Windows (non-specific)
Windows (double / triple panes)
Windows (gas-filled – argon, krypton)
Windows (low-e, low-emissivity)
Other: _____
DK / None

6b. In general, how willing are homebuyers **to pay for the additional costs** that may be associated with these energy-efficient measures? Are they … [READ LIST]?

Extremely willing
Very willing
Somewhat willing
Not very willing, or
Not at all willing
[DNR:] DK / refused

7. How regularly do you promote energy efficiency and energy-efficient features to buyers of new tract homes? This may include advertising, brochures, and other sales materials, as well as conversations with prospective homebuyers. Would you say…[READ LIST]?

Always,
Often,
Sometimes,
Rarely, or
Never
[DNR:] DK/refused

8. PART 1: When you are selling a new tract home, how often would you say you have easy access to the following energy-related information on the home? Would you say always, often, sometimes, seldom, or never?

PART 2: And (just to check) how often would you say you tell the buyer about [EACH ITEM THAT HAS ACCESS TO]? Again, would you say always, often, sometimes, seldom, or never?

PART 3 And finally, how often does the buyer ask about [ITEM] before you tell them about it? Again, would you say always, often, sometimes, seldom, or never?

8a. The home's energy saving features such as double-paned windows and insulation.

Access?	Always	Often	Sometimes	Seldom	Never
Tell buyer?	Always	Often	Sometimes	Seldom	Never
Buyer asks?	Always	Often	Sometimes	Seldom	Never

8b. Efficiency rating of the air conditioning system

Access?	Always	Often	Sometimes	Seldom	Never
Tell buyer?	Always	Often	Sometimes	Seldom	Never
Buyer asks?	Always	Often	Sometimes	Seldom	Never

8c. Efficiency rating of the heating system

Access?	Always	Often	Sometimes	Seldom	Never
Tell buyer?	Always	Often	Sometimes	Seldom	Never
Buyer asks?	Always	Often	Sometimes	Seldom	Never

8d. The techniques used to install the ductwork for the heating and cooling systems

Access?	Always	Often	Sometimes	Seldom	Never
Tell buyer?	Always	Often	Sometimes	Seldom	Never
Buyer asks?	Always	Often	Sometimes	Seldom	Never

RNC / ENERGY STAR PROGRAM AWARENESS / PARTICIPATION / PERCEPTIONS / INTENTIONS

9. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those?

NO/NONE/DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q9; IF COMFORT HOME ALREADY MENTIONED, GO TO Q10A.]
9a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q10a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK IN SCE/SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q9C.]
9b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE/SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q9; IF ENERGY ADVANTAGE ALREADY MENTIONED, FOLLOW Q9C "YES" LOGIC.]
9c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q12a IF NOT)
No (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)
Don't know (SKIP TO Q11a IF AWARE OF COMFORTWISE, Q14 IF NOT)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q9; IF COMFORTWISE ALREADY MENTIONED, GO TO Q13A.]
9d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q13a)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[ASK Q10a IF AWARE OF **PG&E COMFORT HOME**; OTHERWISE GO TO Q14.]
10a. As far as you know, in 1999 has your firm sold any new tract homes built under the PG&E Comfort Home Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF SALES AGENT IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q10E; OTHERWISE ASK Q10B.]
10b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you sold program homes in 1999?

10c. How many program homes have you sold in 1999?

____ Homes

10d. And, how did your sales approach for these program homes differ from your sales approach for typical new tract home installations, if at all?

10e. What changes, if any, have you made in your approach to selling new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
10f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

10g. Why/why not? Why else do you say that?

[ASK Q11a IF AWARE OF **SCE COMFORTWISE**; OTHERWISE GO TO Q12a.]
11a. As far as you know, in 1999 has your firm sold any new tract homes built under the Southern California Edison ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q12a)
Don't know (SKIP TO Q12a)

[IF SALES AGENT IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q11E; OTHERWISE
ASK Q11B.]
11b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you sold program homes in 1999?

11c. How many program homes have you sold in 1999?

____ Homes

11d. And, how did your sales approach for these program homes differ from your sales approach for typical new tract home installations, if at all?

11e. What changes, if any, have you made in your approach to selling new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
11f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

11g. Why/why not? Why else do you say that?

[ASK Q12a IF AWARE OF **SOCALGAS ENERGY ADVANTAGE**; OTHERWISE GO TO Q14.]
12a. As far as you know, in 1999 has your firm sold any new tract homes built under the Southern California Gas Energy Advantage Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF SALES AGENT IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q12E; OTHERWISE
ASK Q12B.]
12b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you sold program homes in 1999?

12c. How many program homes have you sold in 1999?

____ Homes

12d. And, how did your sales approach for these program homes differ from your sales approach for typical new tract home installations, if at all?

12e. What changes, if any, have you made in your approach to selling new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
12f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

12g. Why/why not? Why else do you say that?

[ASK Q13a IF AWARE OF **SDG&E COMFORTWISE**; OTHERWISE GO TO Q14.]
13a. As far as you know, in 1999 has your firm sold any new tract homes built under the SDG&E ComfortWise Program?

Yes (CONTINUE)
No (SKIP TO Q14)
Don't know (SKIP TO Q14)

[IF SALES AGENT IS DEDICATED TO ONE BUILDER AT 4D, SKIP TO Q13E; OTHERWISE ASK Q13B.]
13b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you sold program homes in 1999?

13c. How many program homes have you sold in 1999?

____ Homes

13d. And, how did your sales approach for these program homes differ from your sales approach for typical new tract home installations, if at all?

13e. What changes, if any, have you made in your approach to selling new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]
13f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)
DK/refused (CONTINUE)

13g. Why/why not? Why else do you say that?

[ASK IF DOES NOT VOLUNTEER AWARENESS OF ENERGY STAR HOMES PROGRAM AT
Q9, OTHERWISE GO TO Q14a:]

14. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

14a. As far as you know, in 1999 has your firm sold any new tract homes built under the Energy Star Homes Program?

Yes (CONTINUE)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

[IF SALES AGENT IS DEDICATED TO ONE BUILDER AT Q4D, SKIP TO Q14E; OTHERWISE
ASK Q14B.]

14b. Which builders are the program participants in those cases? [IF THEY REFUSE TO NAME THEM:] With how many builders have you sold program homes in 1999?

14c. How many program homes have you sold in 1999?

____ Homes

14d. And, how did your sales approach for these program homes differ from your sales approach for typical new tract home installations, if at all?

14e. What changes, if any, have you made in your approach to selling new tract homes, in general, as a result of involvement with this program? What others?

[ONLY THOSE WHO REPORT SOME CHANGES AS A RESULT OF PROGRAM:]

14f. Would you continue these new approaches even if the program were discontinued?

Yes (CONTINUE)
No (CONTINUE)

DK / refused (CONTINUE)

14g. Why / why not? Why else do you say that?

[QUESTIONS 15-29 SKIPPED ON PURPOSE.]

PERCEIVED HOMEBUYER CHARACTERISTICS/PREFERENCES

30. Now let's talk a little bit more about homebuyers. Would you say home buyer demand for energy-saving features has increased, decreased, or stayed the same over the last 5 years?

Increased (CONTINUE)
Decreased (CONTINUE)
Stayed same (GO TO Q32)
DK / refused (GO TO Q32)

31a. What factors are behind that trend, in your opinion?

32. In your opinion, do buyers expect all newer homes, say 5 years old or less, to be built to save energy?

Yes
No
Don't know

33. Have homebuyers you've worked with ever specifically asked about homes that were more energy efficient than the state building code requires?

Yes
No
Don't know

IF YES:
33a. About what percentage over the last year or so? _____

34. How much, if at all, would you say home buyers associate energy saving features with home quality? Please use a scale of 1 to 5 where 1 is not at all, and 5 is very strongly.

1 2 3 4 5 Don't know

35. How much, if at all, would you say home buyers associate energy saving features with home comfort? Please use a scale of 1 to 5 where 1 is not at all, and 5 is very strongly.

1 2 3 4 5 Don't know

[ASK Q36 AND 37 IF RESPONDENT AWARE OF ENERGY STAR PROGRAM AT Q14; IF NOT AWARE OF PROGRAM AT Q14, SKIP TO Q38.]

36. Among homebuyers who care about energy efficiency and are willing to pay for energy-saving features, how important do you think having the Energy Star brand would be in their selection of a home? Please use a scale of 1 to 5 where 1 is not at all important, and 5 is extremely important.

1 2 3 4 5 Don't know

37. Why do you say that? Why else?

BARRIERS, PERCEPTIONS, AND INTENTIONS

38. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from selling more energy-efficient homes, that is, homes that exceed the state code for energy efficiency, which all new homes must meet. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

    Increased home cost associated with including energy-saving features _____
    Lack of financing for homebuyers that factors in energy savings _____
    Concern that the specific features won't save as much as buyers expect _____
    Not enough specific options for saving energy _____
    The hassles involved in providing energy-saving options _____
    Builder policies and procedures that hinder the use of energy-efficient designs _____
    Company policies and procedures that hinder promotion of energy efficiency _____
    Not enough sales agent support in terms of training and promotional materials _____
    Lack of homebuyer confidence in the benefits of energy efficiency _____
    Lack of homebuyer willingness to pay for energy efficiency _____

39. Given the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from selling more energy-efficient homes?

40. Please think about everything you've experienced, seen, or heard about energy-saving measures in new homes, as well as buyer willingness to pay for new homes. On that basis, over the next 2 or 3 years would you expect the proportion of your new tract home sales that exceed minimum energy efficiency codes to increase, decrease, or stay the same? This would <u>exclude</u> any utility or other energy efficiency programs.

    Increase
    Decrease
    Stay the same
    DK/refused

41. What changes, if any, do you think are likely in terms of the <u>ways</u> that you'll address energy efficiency issues in selling new tract homes, over the next 2 or 3 years?

[Q42-44 SKIPPED ON PURPOSE.]

EEM'S / TRAINING / WRAP-UP

45. Now I'd like to ask you a few questions about home financing. There is something called an "energy efficiency" mortgage. This allows the buyer to qualify more easily or borrow more money on the assumption their energy bills will be lower so they will have more income available to pay their mortgage. Have you ever heard of this before I explained it?

Yes (CONTINUE)
No (GO TO Q47a)
Don't know (GO TO Q47a)

46. Are these types of mortgages are available in your area?

Yes (CONTINUE)
No (GO TO Q47a)
Don't know (GO TO Q47a)

47. Have any of your 1999 homebuyers have used an energy efficiency mortgage?

Yes
No
Don't know / refused

47a. Are you aware of any training on energy efficiency or energy efficiency mortgages, provided by your utility in 1999?

Yes
No (SKIP TO Q48)
Don't know / refused (SKIP TO Q48)

47b. Have you attended any of these training sessions this year?

Yes
No (SKIP TO Q48)
Don't know / refused (SKIP TO Q48)

47c. How has this training affected the way you sell new tract homes, if at all?

48. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you

for your time, attention, and very valuable input.

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STATEWIDE RNC
MORTGAGE LENDERS SURVEY
FINAL

PG&E service territory……. 1
SCE/SCG service territory.. 2
SDG&E service territory….. 3

INTRODUCTION/SCREENING/ICEBREAKERS

Hello, my name is _____ and I'm calling from Quantum Consulting, a market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the mortgage lending process for new homes. May I please speak with the senior loan officer for residential mortgages at this location? [IF VOLUNTEERS NO RESIDENTIAL HOME/MORTGAGE LENDING, TERMINATE.]

[IF NECESSARY:] This survey is extremely important to the Board's understanding of how lending decisions are made, and how different aspects of the home affect lending policies. We're offering $35 to the appropriate person at your firm to speak with us for about 15 minutes.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ and I'm calling from Quantum Consulting, an energy market research firm based in Berkeley, California. First, I want to assure you that this is not a sales call. The California Board for Energy Efficiency has asked us to help them better understand the mortgage lending process for new homes. Can I confirm that you're the senior loan officer for residential mortgages at this location?

Yes	[CONTINUE]
No/DK	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]
Refused	[TERMINATE]

This survey is extremely important to the Board's understanding of how lending decisions are made, and how different aspects of the home affect lending policies. We're offering $35 if you'll spend about 15 minutes sharing with us your insights about the residential lending process, and how different aspects of the home may affect lending policies.

[IF NECESSARY:]
All your answers are held confidential, that is, we never link any information to a particular person or company. Is now a good time?

Yes	[CONTINUE]
No	[SET UP CALLBACK]
DK/refused	[TERMINATE]

For purposes of this survey, I use the word "tract" to mean a home in a new residential development where all the homes were built by the same builder or developer. A "custom" home is defined as a home designed and built for a particular customer, if you tend to make distinctions between tract home and custom home mortgages. [TAKE NOTE IF THEY MENTION AT THIS POINT THAT THEY DO NOT MAKE THAT DISTINCTION.]

1. First, just to check, are you familiar with your institution's mortgage qualification policies, inspection requirements, and the range of financing products available?

   Yes
   No (ASK TO SPEAK WITH APPROPRIATE CONTACT)
   Refused (TERMINATE)

2. In 1999, has your institution provided loans for customers purchasing new single-family detached homes in tract developments?

   Yes (CONTINUE)
   No (TERMINATE)
   DK/refused (TERMINATE)

2a. Do you have any agreements with builders of tract home developments, where your firm is the "preferred lender" except in cases where buyers get their own financing?

   Yes (CONTINUE)
   No (SKIP TO Q3)
   DK/refused (SKIP TO Q3)

2d. About how many mortgages will you write in 1999 for homes in tract developments where your firm is the preferred lender?

   _____ Homes where firm is preferred lender

3. How many years have you, personally, been involved in residential mortgage lending?

   _____ Years in residential mortgage lending

CHARACTERISTICS OF LOANS AND LENDING PROCESS

3a. How many branches does your firm have in California?

   _____ Branches in California

3b. Does your firm serve the entire state?

Yes
No
DK / refused

4. Does your firm write residential mortgage loans at a branch level, regionally, or only at a corporate level?

   Branch level
   Regional level [ASK HOW MANY REGIONS IN CALIFORNIA:] _____
   Corporate level
   DK / refused

5. Are the residential mortgage loan decisions made by a single officer or individual, or by a management committee?

   Single officer / individual
   Management committee
   Varies by region / branch
   DK / refused

6. How much authority do you personally have in interpreting and applying loan policy? Would you say you have complete authority, significant authority, moderate authority, or limited authority? [IF NEEDED:] We're just trying to get a general feel for this across the range of people we're talking to.

   Complete authority
   Significant authority
   Moderate authority
   Limited authority (also covers "no authority" if this response occurs)
   DK / refused

7. How often are your residential mortgage policies reviewed? (IF NEEDED, CLARIFY THIS PERTAINS TO THEIR AREA OF MORTGAGE OPERATIONS.) [RECORD IN MOST APPROPRIATE CATEGORY.]

   Ongoing / more often than once a quarter
   Once a quarter
   More than once a year
   Annually
   Every 2-3 years
   Less often than every 2-3 years
   DK / refused

8. What are the main factors considered during policy reviews?

"For these next questions, please answer based on the areas where your regularly write mortgages, as opposed to broader regional or corporate information if that's something different."

9. In 1999, about what percentage of your residential mortgage loans were for new, single family detached homes?

   _____% SFD

10. And, thinking about your 1999 loans for new, single family detached homes, what percentage of those were for tract homes, as opposed to custom homes?

    _____% Tract homes

[IF RESPONDENT IS UNAWARE OF THE SPLITS REGARDING TRACT VERSUS CUSTOM HOMES - "I NEVER KNOW WHICH TYPE OF CONSTRUCTION / RELATIONSHIP IS INVOLVED" – EXCLUDE THIS DISTINCTION FROM REMAINING QUESTIONS.]

"OK, for the rest of this survey we'll be talking about new, single family, detached tract homes."

[Q11 EXCLUDED ON PURPOSE.]

12. And about what percentage of the new tract homes for which you wrote loans in 1999 falls into each of the following price categories? [READ LIST] Your best estimate is fine.

Under $100,000	_____%
$100,000 but under $200,000	_____%
$200,000 but under $300,000	_____%
$300,00 but under $500,000	_____%
$500,000 or more	_____%
DK / refused	

(INTERVIEWER ALTERNATIVE FOR THOSE UNABLE / UNWILLING TO PROVIDE THE BREAKDOWN:) What is the average purchase price of the new tract homes for which you wrote mortgages in 1999?
$_____

13. What is the average percentage of the purchase price you receive as a down payment?

    ____% Average down payment

14. What is your policy regarding the maximum percentage of wages or salary allowed for PITI?

____% Maximum PITI % (PRINCIPAL, INTEREST, TAXES, INSURANCE - THE "TRADITIONAL" RATIO IS THOUGHT TO BE SOMEWHERE IN THE RANGE OF 28%-33%.)

[Q15-18 EXCLUDED ON PURPOSE.]

GENERAL AND ENERGY-RELATED MORTGAGE LENDING FACTORS

19. In the last year or two, have you noticed any increase in the building and marketing of more energy-efficient new tract homes – that is, homes that exceed California energy codes?

    Yes (CONTINUE)
    No (SKIP TO Q23)
    DK / refused (SKIP TO Q23)

20. What specifics can you recall about these changes? (IF NECESSARY:) How did you know about these changes, how did they build or market homes differently?

21. How have these changes affected your mortgage lending practices or business, if at all?

22. Can you recall the names of any specific builders or contractors that you associate with building and marketing more energy-efficient tract homes?

23. To what degree would you say that your firm's lending policies generally associate any energy-saving equipment installed in a new home with home quality? Please give me a 1 to 10 rating, where 10 indicates an extremely high association between energy savings and home quality, and 1 indicates no association at all.

    _____

24. Why do you say that?

25. Would you say that builders of new tract homes differ in the degree to which quality is associated with the installation of energy-saving equipment? [IF YES, PROBE FOR PERCEIVED REASONS AND FACTORS CHARACTERIZING THE DIFFERENT TYPES OF BUILDERS.]

26. Based on your experience in working with buyers of new tract homes, or what you may have seen or heard, how much buyer demand is there in general for tract home features that save energy? Would you say there is…[READ LIST]?

A lot
Some
Little
Very little, or
None
[DNR:] DK – Have no contact with/knowledge of buyer needs/demand
[DNR:] DK/refused

27. In your opinion, what would help increase buyer demand for energy-saving features or equipment in new tract homes?

[Q28 EXCLUDED ON PURPOSE.]

PROGRAM AWARENESS / PERCEPTIONS / INTENTIONS

29. Have you heard of any utility- or government-sponsored programs encouraging the installation of energy-efficient features in new homes? [IF YES:] Which programs are those? [THEY MAY HAVE MENTIONED PROGRAM HOMES EARLIER.]

NO/NONE/DK
Comfort Home
ComfortWise
Energy Advantage
Energy Star (Homes Program)
Other: _____

[ASK IN PG&E SERVICE TERRITORY IF COMFORT HOME NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29a. Have you heard about PG&E's Comfort Home Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q30)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

[ASK IN SCE/SOCALGAS TERRITORY IF COMFORTWISE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q29C:]
29b. Have you heard about Southern California Edison's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK IN SCE/SOCALGAS TERRITORY IF ENERGY ADVANTAGE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29c. Have you heard about the SoCalGas Energy Advantage Program as one that encourages installation of energy-efficient features in new homes?

Yes (SKIP TO Q30)
No (SKIP TO Q30)
Don't know (SKIP TO Q30)

[ASK IN SDG&E TERRITORY IF COMFORTWISE NOT MENTIONED IN Q29; OTHERWISE SKIP TO Q30:]
29d. Have you heard about SDG&E's ComfortWise Program as one that encourages installation of energy-efficient features in new homes?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK Q30 IF NOT AWARE OF ENERGY STAR HOMES PROGRAM AT Q29; OTHERWISE GO TO Q31:]
30. Have you heard about the U.S. Department of Energy's Energy Star Homes Program as one that encourages the use of energy-efficient practices and features in new home construction?

Yes (CONTINUE)
No (CONTINUE)
Don't know (CONTINUE)

[ASK Q31 FOR EACH PROGRAM RESPONDENT REPORTED AWARENESS OF **(LABEL RESPONSES):** IF NO REPORTED PROGRAM AWARENESS, SKIP TO Q35.]
31. What do you know, or recall seeing or hearing about the [PROGRAM] program? [THIS MAY INCLUDE ADVERTISING AND/OR SEEING PROGRAM HOMES.]

[ASK Q32 FOR EACH PROGRAM RESPONDENT REPORTED AWARENESS OF **(LABEL RESPONSES):]**
32. How do you recall being made aware of the [PROGRAM] program?

33. Do you know if your firm (branch, region) wrote any mortgages in 1999 for homes that were built under this/one of these program(s)? [IF YES:] How many mortgages would you estimate you wrote for program homes in 1999?

    _____ Program home mortgages in 1999

    [IF "NONE" SKIP TO Q35.]

34. What do you recall that may have been different about the mortgages you wrote for these program homes, compared to the average tract home mortgage you write?

35. Are you aware of any energy efficiency training or information for lenders provided by your utility company in 1999?

    Yes (CONTINUE)
    No (SKIP TO Q39)
    DK/refused (SKIP TO Q39)

36. Have you attended any of these training sessions or obtained any of this information provided by the utility?

    Yes (CONTINUE) [CONFIRM UTILITY NAME:] _____
    No (SKIP TO Q38)
    DK/refused (SKIP TO Q39)

37. How has this training/information affected the way you provide residential loans, or evaluate or approve loan applications, if at all?

[SKIP TO Q39]

38. Why have you chosen not to? Why else?

39. What training on the economics or other benefits of energy efficiency would you like to see your utility provide, that might have an impact on how you provide residential loans, or evaluate or approve loan applications?

[ASK Q40 UNLESS RESPONDENT SAYS "NONE" AT Q39:]
40. What would be the best way and the best time to provide that training?

APPRAISALS AND CERTIFICATION

41. Are your home appraisals designed to capture information about the home's energy efficiency or energy usage features or characteristics?

Yes (CONTINUE)
No (SKIP TO Q46)
DK / refused (SKIP TO Q46)

41a. What specific kinds of energy efficiency or energy usage information are provided in your appraisals? [RECORD BELOW UNDER Q41a COLUMN.]

41b. Do your appraisals typically provide information on [ASK FOR EACH LISTED ITEM NOT ALREADY MENTIONED AT Q41a.]? [RECORD ALL "YES" RESPONSES.]

	Q41a	Q41b
Overall home energy efficiency ratings	1	1
Degree / percent exceeded Title 24	2	2
HVAC SEER levels	3	3
Furnace AFUE levels	4	4
Insulation R-levels	5	5
Window efficiency ratings	6	6
Other: _____		8

42. Overall, what percent of your appraisals for new tract homes contain this kind of energy efficiency information?

____ %

43. [IF GREATER THAN ZERO PERCENT:] When reviewing appraisals for new tract homes, how much importance do you place on energy efficiency information versus more traditional criteria, like the PITI percentage or the applicant's credit history? Do you place …[READ LIST] … on energy efficiency information? [NOTE THAT PITI GENERALLY IS ASSESSED BEFORE OTHER

CONSIDERATIONS LIKE ENERGY EFFICIENCY COME INTO PLAY, IF AT ALL.]

More importance (CONTINUE)
About the same importance (SKIP TO Q44)
Less importance (CONTINUE)
Or, no importance (SKIP TO Q44)
[DNR:] DK/refused (SKIP TO Q46)

43a. Is that much (less/more), somewhat (less/more), or slightly (less/more) importance?

Much (CONTINUE)
Somewhat (CONTINUE)
Slightly (CONTINUE)
DK/refused (SKIP TO Q45)

44. Why do you say that? Why else?

[SKIP TO Q46 IF "NO IMPORTANCE" AT Q43:]

45. How is energy efficiency information factored in to the approval process, or the loan itself, if at all?

46. If you knew that a utility-approved certification of a new tract home's energy efficiency was available, how <u>useful</u> would that be in your consideration of energy efficiency in the approval process? Would you say…[READ LIST]?

Extremely,
Very,
Somewhat,
Not very, or
Not at all useful
[DNR:] DK/refused

46a. Why do you say that? Why else?

[ASK Q47 IF AWARE OF ENERGY STAR EARLIER AT Q29 OR Q30; IF NOT AWARE OF ENERGY STAR, SKIP TO Q47b.]

47. If you knew that an Energy Star-approved certification of a new tract home's energy efficiency was available, again how <u>useful</u> would that be in your consideration of energy efficiency in the approval process? Would you say…[READ LIST]?

Extremely,
Very,
Somewhat,
Not very, or
Not at all useful
[DNR:] DK/refused

47a. Why do you say that? Why else?

47b. [ASK IF NOT ALREADY MENTIONED:] Before today, were you aware of any specific utility or Energy Star home energy efficiency certifications like I described to you? [IF YES:] What is/are their names, and who sponsors them?

CHEERS: _____
HERO: _____ HERS: _____
Other mentions: _____
DK/refused

<u>ENERGY-EFFICIENCY MORTGAGES</u>

48. [IF NOT PREVIOUSLY MENTIONED:] Have you ever heard of energy efficiency mortgages for new homes? These are mortgages that take into account the reduced operating expenses, and increased available monthly cash flow, resulting from energy-efficient design and features.

Yes (CONTINUE)
No (SKIP TO Q60)
DK/refused (SKIP TO Q60)

49. Do you offer energy efficiency mortgages as I've described them?

Yes (CONTINUE)
No (SKIP TO Q56)
DK/refused (SKIP TO Q56)

50. When did you begin to offer them?

19 __ __

51. What were the main reasons for doing so?

52. Which of the following benefits do you offer as part of an energy-efficiency mortgage? [READ LIST]

    Easier qualification / flexible qualifying ratios (i.e., beyond the "traditional" values)
    Higher loan-to-value ratio
    Higher appraised value
    Rate protection
    Lower closing costs / initial fees
    Lower interest rate
    Cash back
    Free pre-approval
    Other (Please specify): _____
    [DNR:] None of the above

53. What are the advantages to your firm of offering energy efficiency mortgages?

54. What disadvantages are there, if any?

55. Did your firm experience any pressure from secondary lenders to offer such an instrument or to not offer one? [IF YES, PROBE.]

[SKIP TO BARRIERS AT Q62 AFTER ANSWERING Q55.]

56. What are the major reasons your firm does <u>not</u> offer energy-efficiency mortgages?

57. What factors would lead to a policy change in this area?

58. Has your firm experienced any pressure from secondary lenders to offer such an instrument or not to offer one? [IF YES, PROBE.]

59. Have you had inquiries about the availability of energy-efficiency mortgages from borrowers? [IF YES:] What specific benefits have borrowers requested (REFER TO LIST Q. 52 FOR EXAMPLES.)

60. About how much more business could you write if you had the ability to offer energy efficiency mortgages as I described them a moment ago?

61. Let's take an example where a borrower applies for a mortgage that would result in a $1500 monthly mortgage payment on a new tract home, with a standard down payment, and they're on the borderline of qualifying. Let's assume that the home was certified by your utility to be 30 percent more energy-efficient than the standard home of its size, type, and location, although actual savings will depend on the size of the family and how it uses energy. Given that information, what minimum amount of monthly savings would you need to assume, in order for the home's higher energy efficiency rating to persuade you to approve the loan?

    $ _____

BARRIERS AND WRAP-UP

62. I'm going to read you a series of brief phrases. Please rate each one in terms of how important it is in preventing you from providing (more) energy efficiency mortgages in new tract homes. Use a scale from 1 to 5, where 1 is not at all important and 5 is extremely important. [CHANGE THE ORDER OF PRESENTATION ACROSS RESPONDENTS.]

    [AS NEEDED:] Again, an energy efficiency mortgage takes into account the reduced operating expenses, and increased available monthly cash flow, resulting from energy-efficient design and features.

    Increased hassle associated with reviewing and processing them _____
    Lack of information on how to evaluate the effects of specific home features on monthly cash flow savings _____
    Lack of a certified energy efficiency rating from the utility or government _____
    Concern that features described as energy-efficient won't really save the homebuyer money each month _____
    Lending policies and procedures at your firm that hinder the consideration of energy efficiency in reviewing applications _____

Lack of a secondary market for energy efficiency mortgages _____
Lack of information from independent appraisers on
the value of energy efficiency
_____
Lack of evidence that buyers value energy efficiency _____
The cost and hassle involved in developing and marketing a new product_____
Sufficient mortgage demand without needing to use this kind of loan _____
This kind of loan isn't very different from others available _____

63. Considering the kinds of factors I just asked about, what <u>other</u> factors, if any, are important in preventing you from providing (more) energy efficiency mortgages?

64. Before we close, what other input do you have regarding either energy efficiency in new homes, or the energy efficiency programs I asked you about earlier?

Job description / title _____

Those are all the questions I have. Thank you very much for your time and your help.

Name _____
Company name _____

On behalf of the California Board for Energy Efficiency and Quantum Consulting, thank you for your time, attention, and very valuable input.
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C. RNC MARKET ACTORS AND ADOPTION STAGES MAPPED TO SURVEY QUESTIONS

Appendix C
RNC Market Actors and Adoption Stages Mapped to Survey Questions

		Consumers	Builders	Architects	Appraisers	T24 Consults.	Contractors	Sales Agents	Lenders
	Q #s for "X" programs*	NA	10 thru 14	10 thru 14	NA	10 thru 14	10 thru 14	10 thru 14	NA
Adoption Stages	**Sustainability**	47 (parts/EE buyers)	Xh-eye, l, m, p	Xf, g	NA	Xf, g	Xh, eye, l, m	Xf, g	NA
	Action	20, 22	8c, Xa-f, j, k, n, o, 15-17, 20, 21, 24, **43**, 43a	7, Xa-e, 15-17, 20, 25, 44, 45	36-38, 43, 43a	7, 8, Xa-e, 15-17, 20, 22, 44-45	5-5c, 7, 7a, 7c, 8a-f, Xa-e, g, j, k, 15-18, 25-25b, 26a-29	7, 8, Xa-e, 47b, 47c	21, 33, 34, 36, 37-42, 49-50, 55, 58, 59
	Intention	**47**	**41, 42**	40, 41	28-28c	40, 41	19, 20, 41-42a	40, 41	56-57
	Barriers	49	7, 8a, 25-29, 38-40	5, 5a, 26, 27, 38, 39	44, 45	38, 39	38, 39	38, 39	62, 63
	Perception/ Evaluation	14, 21, **48**, (Barriers 49)	7, 8, 8a, 18, 19, 25-29, 30-37 (Barriers 38-40), 44	5, 5a, 17a-19, 26, 27, (Barriers 38-39)	25, 26 (Barriers 45, 46)	6, 18-19a, 21, (Barriers 38, 39)	30-32, (Barriers 38-39)	5-6b, 30-37, (Barriers 38-39)	23-27, 43-47a, 51-54, 60-61, (Barriers 62-63)
	Knowledge	**29-44**	**8b**, Xg	6	23-23b	5	7b, Xf, 21-24	NA	20, 31,
	Awareness	**15-19**, 23-26	9-9d, 14, 45-47	9-9d, 14, 42-43a	10-18a, 27, 29-35, 41, 42	9-9d, 14, 42-43a	9-9d, 14, 26	9-9d, 14, 45-47a	19, 22, 29-30, 32, 35, 47b, 48
	Descriptors	3-7, 50+	1-6	1-4d	3-8	1-4	1-4a, 6	1-4d	1-14

* Varies slightly for Energy Star portion of "X" question program participation sequence.

Awareness can pertain to either program or EE solution awareness.
Knowledge pertains to understanding of EE and/or program specifics.
Perception/evaluation presumes some baseline market actor knowledge, and describes his/her assessment of the ability of known EE solutions/programs to meet future needs.
Intention generally refers to pre-purchase intent to exhibit EE behavior, presuming favorable perception/evaluation.
Action denotes the purchase, provision, or recommendation of EE solutions, including proactive acquisition of training and tools.
Sustainability refers to indications of active post-purchase EE search, consideration, and use.
Barriers refer to specific agree/disagree statements tied to specific market barriers, augmented by selected verbatim responses.
Descriptors are simply demographics and firmographics for descriptive and end user segmentation; also includes utility service territory.

Note that in some cases barriers and other measure types overlap.

XX Denotes/includes milestone-based progress indicators.