

THE DEVELOPMENT, IMPLEMENTATION AND
EVALUATION OF THE ENERGY CONSERVATION
HOME PROGRAM

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ABSTRACT

The Energy Conservation Home (ECHome) Program was introduced by Pacific Gas & Electric Company in May of 1976 to encourage the installation of energy saving features in new homes beyond building code requirements. In return for participation, PG&E offered builders a variety of incentives including signs, brochures, and advertising to promote the benefits of an ECHome. Financial incentives were also offered for a period of time.

Despite the reduced volume of housing starts due to continuing record high interest rates, the ECHome Program proved its resilience as a strong marketing tool for the builder. A study found that 82% to 86% of potential home buyers consider energy conservation features to be a "very/somewhat important" factor in selecting a new home. Another study found a 96% satisfaction rate with ECHome owners, likely resulting from the 10% to 20% energy savings accomplished by test homes compared to other homes built during the same period. In the last five years, the percentage of new housing connections within the PG&E service territory that qualify for the ECHome Program have increased from 6% to 66%, with more builders participating because they believe that home buyers want energy conservation features in their new homes. The success of this program contributed, in part, to the Energy Building Regulations (Title 24) recently adopted by the California Energy Commission. As the ECHome Program would be superseded by these regulations, it was closed to new applications in February 1982.

This program combines marketing techniques, technical analyses, and market research technology to voluntarily affect residential construction practices.

1. THE DEVELOPMENT, IMPLEMENTATION AND
EVALUATION OF THE ENERGY CONSERVATION
HOME PROGRAM

Ten years ago the utility industry enjoyed plentiful and inexpensive energy supplies. Load growth was welcomed because it resulted in a larger base for revenues and a lower energy cost for utility customers. Energy rates reflected this. The charge for each unit of energy went down as total usage increased, due to economies of scale.

The fuel shortage experienced during the early 1970's, and increasing costs of new construction, reversed this trend as incremental units of energy began to cost more, not less. Conserved energy became one of the least expensive and most environmentally acceptable sources of "new" energy supplies.

1.1. The New Home Market Place

In 1973, conservation-related standards for new residential construction did not exist. Many of the 91,000 new homes connected within the PG&E service territory that year did not contain insulation or weatherstripping, and virtually none of them contained the efficient appliances and design features that are becoming common today. Clearly, there was substantial room for improvements.

As a result, PG&E began actively encouraging higher efficiencies in new dwellings as stated in PG&E Market Outlook, 1973.

"New Home Building Standards, too, must recognize energy conservation construction techniques. These may cause higher first cost of homes, but in the long run conserve energy use and reduce the homeowner's gas and electric bills."

"Home insulation to cut heating bills will be seen as an increasingly good investment. Design and construction practices with an eye toward weather may be expected to a greater degree in future residential development."

1.2. ECHome Program Introduction

In 1973, PG&E introduced a forerunner to the Energy Conservation Home (ECHome) Program, encouraging builders to install energy efficient gas appliances, insulation in walls and ceilings, and weatherstripping. The "Timetable from actual usage (as are the other estimates listed here). codes and the ECHome Program in chronological order.

In 1974, California became the first state in the nation to establish insulation standards for new homes. The requirement of R-19 ("Thermal Resistance (R)" means the measure of the resistance of a material or building component to the passage of heat in $\text{\$/hr-ft}^2\text{-}^\circ\text{F}$ " over "Btu $\text{\$/}$) ceiling insulation and R-11 wall insulation became effective in February, 1975. It was predicted at that time that home buyers would recover the added costs through energy savings within three or four years.

1.3. Program Development and Expansion

The most recent format for the ECHome Program was introduced in May of 1976 to encourage the installation of energy saving features in new homes beyond those required by building codes. Copies of the ECHome Requirements and Agreement are included in Appendices A and B, respectively. Qualification for this significantly expanded program was based on a scoring system where one point equalled an estimated energy savings of either three therms of gas or 30 kilowatt hours of electricity. To qualify, homes must have had a minimum of 50 points, verified by on-site inspections. A large variety of features were pre-scored for easy builder selection, though points could be calculated for virtually any features if the energy savings potential could be determined.

The ECHome Program rated and recognized energy related improvements rather than estimating anticipated energy consumption. It was similar, for example, to reporting a 2-mpg increase in mileage from a tune-up, without making an exact statement about overall fuel economy. When the program was designed, negative points were considered for energy wasting features which were allowed by

building codes. The decision was made to focus on the positive, reflecting energy improvements only, as the most solid foundation for a program that would be accepted by most builders.

1.4. Alternatives Considered

Consideration was given to utilizing other criteria for program qualification. Prescriptive standards, such as requirements for the installation of specific features, were thought to be too inflexible, considering the diversity of climate throughout the PG&E service territory. Alternatively, computer simulation models could allow flexibility for builders in meeting an "energy budget" using conservation features of their choice. This alternative, however, would be expensive and complex for practical presentation by more than 200 utility representatives to a large number of builders of varying size.

The scoring system, which was developed for the ECHome Program, combines the favorable attributes of both the prescriptive and energy budget forms, without their negative marketing aspects. It is simple and accurate while allowing builders to select the combination of conservation features that maximize cost effectiveness.

1.5. Marketing Techniques

In return for participation, PG&E offered builders such marketing tools as model home signs, sales brochures, highlight signs, and certificates for qualified dwellings. In addition, PG&E sponsored advertising to inform the public about the advantages of owning an energy-efficient home. This advertising also identified participating builders in specific areas for the convenience of customers.

Media advertising made builders' homes more visible to the buying public. On-site signs and highlight signs identified the extra conservation features offered by the builder. An "Energy Conservation Home" certificate supported builders' claims that the houses contained features beyond code requirements, which would result in energy savings for the homeowner.

The ECHome Program was not the first of PG&E's builder related activities, though it was certainly the most complex. Many of the marketing techniques used in this program were derived from previous successful efforts, including the Gold Medallion, Bronze Medallion, Blue Star, and Modern Gas Home Programs. The apparent key to success of each of these programs was that they were:

1. Voluntary.
2. Cost effective from the builders viewpoint.
3. Personally presented to builders by Company representatives with whom they have previously established a working relationship.

These programs were all similar in that they encouraged building contractors to construct a more effective product to the benefit of the customer.

During the first full year of implementation (1977), more than 20% of the homes built in PG&E's service territory qualified as ECHomes. This level of participation established a continuing trend of program growth as indicated in Table 2.

Despite the recently reduced volume of housing starts due to continuing high interest rates, the ECHome Program proved its resilience as a strong marketing tool for the builder.

1.6. Premium ECHomes

In March of 1978, the California Public Utilities Commission authorized PG&E's Premium Energy Conservation Home Program which was designed to accomplish a higher level of energy improvements (100 points). This program added incentives of \$60 per qualifying dwelling to the marketing tools offered by the basic ECHome Program. The monetary incentives were intended to partially offset the added costs the builder would experience by installing the additional conservation features, which ranged from as low as \$100 to \$300 per home.

Shortly after the Premium ECHome Program was established, the California Energy Commission adopted Energy Building Regulations (Title 24 of the California Administrative Code) for new residential buildings. These standards incorporated many of the features that were voluntarily promoted through PG&E's builder programs.

In July of 1979, both of the ECHome Programs were revised to delete any items mandated by Title 24. Energy savings calculations were added at this time for passive solar features -- construction practices that had not previously been quantified as to energy savings capability for point credit.

1.7. Program Consolidation

In January of 1980, the two ECHome Programs were revised and consolidated. Since Title 24 was by then fully in force, the requirement for eligibility was reduced to 50 points beyond building code requirements. However, each point was more difficult and costly to earn.

Monetary incentives were changed from a flat allowance of \$60 per qualifying dwelling to \$2 for each point exceeding 50 points (maximum \$150). This change was designed to offer a more consistent incentive level for each additional energy improvement.

In December of 1980, the ECHome Programs were revised again -- this time to delete the financial incentives which were considered no longer essential to program participation. The PG&E marketing representatives who presented this program to the builders believed that the marketing tools alone (signs, certificates, etc.) were sufficient to accomplish a continuing level of builder participation. The continuing high level of builder participation validated this conclusion.

1.8. Program Conclusion

On June 30, 1981, the California Energy Commission adopted revised Residential Building Standards, which were scheduled for implementation effective July 13, 1982. These strict standards include many of the features which have been voluntarily promoted through the ECHome Program. The resulting homes are expected to use about half the energy of current Title 24 homes.

In February, 1982, in anticipation of the revised standards, PG&E announced the winding down and conclusion of the ECHome Program. This highly successful marketing technique has now come full circle, through a period of almost 10 years, where it experienced multiple revisions in order to maintain consistency of purpose. The ECHome Program favorably affected the marketplace by advancing technology to the benefit of all participants; the builder, the utility, and the customer.

2. EVALUATION OF THE ENERGY CONSERVATION HOME PROGRAM

PG&E's ECHome Program has been a successful incentive plan for home builders and an effective energy conservation product. This section examines the successful characteristics of the ECHome Program and reviews why this builder incentive program served to induce the construction of energy efficient housing.

2.1. The Product Works - ECHomes Save Energy

ECHomes were found to be 10% to 20% more energy-efficient than homes adhering to minimum CEC building standards which were built during the same time period. A recently completed study by PG&E (MR-79-27) found that, after taking into account household differences in appliance stock, housing structure, demographic characteristics, conservation attitudes and practices, weather, and other pertinent data, the ECHomes saved 10% and the Premium ECHomes saved 20% more electrical energy than homes not designated as energy-efficient under PG&E's ECHomes Program. This study involved the statistical

analysis of actual electrical energy usage of 591 ECHome owners in contrast with 301 non-ECHome owners over a one year period. (Due to data limitations, MR-79-27 was limited to an analysis of the actual electric energy savings of the ECHome, and on natural gas savings.)

Another indicator of the success of the ECHomes as a viable energy conservation product is the high level of satisfaction found from the ECHome owners. Market surveys conducted in 1980 found that 96% of ECHome owners were "very" or "somewhat" satisfied with their ECHome (MR-80-3). In market surveys conducted in 1977 and 1978, 96% of the ECHome owners indicated that they would recommend an ECHome to other people, and 95% claimed that they would consider the purchase of ECHome in the future (MR-78-20).

Further, it was determined that the energy savings benefits of ECHomes do not act as a disincentive for home owners to engage in no-cost energy conservation practices (e.g., turning off lights in rooms not in use). This is contrary to a study by Hamrin (1979) of the behavior and attitudes of owners of energy-efficient housing which found that some home owners claimed that, "I don't need to worry about energy conservation. I did my thing by buying a solar house."

Although PG&E's ECHome's construction allows for greater household energy efficiency, it was found in MR-79-27 that ECHomes do not discourage home owners from engaging in conservation practices. It was found that ECHome owners practiced conservation at a rate similar to and, for some measures, greater than non-ECHome owners. Table 3 summarizes the conservation practices claimed by ECHome owners, Premium ECHome owners, and non-ECHome owners (control homes).

Why this occurred with ECHome owners is not clearly understood. One possible explanation may be that consumers who purchase energy-efficient housing may have a different set of conservation attitudes which may be manifested in conservation practices. For example, Hamrin (1979) found that owners of solar homes in Davis, CA, were "sympathetic to energy conservation, and new they were signing up to save energy when they bought their houses and regularly engaged in conservation practices." As another example, the PG&E study MR-79-27 found that ECHome owners were similar in conservation attitudes to non-ECHome owners except for attitudes pertaining to the practicality of (or ease of) conserving in one's household and the perceived financial gains associated with conserving (see Figs. 1 and 2).

It is important to note that conservation attitudes may be an indicator of consumer lifestyle, political and demographic characteristics of the household, which could also explain household energy consumption. It could also be true that energy efficient housing may make it easier for a household to conserve and to see the financial gain for doing so. Nevertheless, these findings indicate that the success of the ECHome depends on the conservation lifestyle and attitudes of the home owners, as well as energy-efficient construction.

Table 4 summarizes some examples of the types of energy efficient housing available in the marketplace today and their relative energy savings.

2.2. The Builder Incentive Works

As an incentive program to motivate home builders to construct more energy-efficient housing (i.e., housing that exceeds CEC energy-efficient building standards), the ECHome Program has been successful. The increase in the proportion of new homes connected that qualify as ECHomes over the past six years speaks to this success. Table 2, mentioned earlier, summarizes the increasing trend in the penetration of ECHomes in the new housing market from 1976 to 1981, that is, an increase from 6% to 66%. This is especially impressive since, in the years from 1976 to 1981, PG&E reduced the monetary incentive to builders and the builders experienced higher costs in order to qualify for the ECHome Program.

Why has builder participation in this program increased over the years? One reason is that the builder perceives that home buyers are becoming more interested in purchasing energy-efficient housing. Marketing surveys conducted in 1978 with home builders found that 36% to 43% of the builders interviewed claim that home buyers want energy conservation features (MR-78-21). As it turns out, builder perceptions of home buyer preferences are accurate. Market surveys in 1980 found that 82% of potential home buyers consider household energy conservation features to be a "very" or "somewhat" important factor in selecting a new home (MR-80-3). In fact, a nationwide survey conducted by Housing Magazine (December 1981) found that home buyers are willing to pay more for energy saving features in new housing, such as ceiling insulation (87%) and solar water heating (42%). But how much more are consumers willing to pay for a home with "the latest conservation features" was \$5,000 (Note: 65% of the customers interviewed were able to indicate how much they would be willing to pay for conservation features). The conservation features mentioned most by these customers were insulation (48%), solar equipment (33%), weatherstripping and caulking (27%), low flow showerheads (27%), and energy saving appliances (22%)

2.3. Why Did PG&E Builder Incentives Work?

As mentioned above, the ECHome Program offered three incentives: advertising and promotional materials, an information package on how to build and equip homes to make them more energy-efficient, and (for a limited time) cash to help reduce the costs of adding conservation features.

Of all the incentives offered by the ECHome Program, the advertising incentive was ranked as the most effective. Although the information package provided to builders, architects, realtors and lenders helped to develop the product (i.e., build more energy-efficient housing), the advertising was perceived by the builders as the key to help sell the product.

In surveys with homebuilders in 1977 and 1978, 94% of the builders felt that the advertising would have a "positive effect on new home buyers" (MR-78-21). This is understandable since advertising is necessary to inform potential home buyers of the availability of energy-efficient housing. Furthermore, of the builders participating in the ECHomes Program, and interviewed in 1977 and 1978, the primary features of the program that were "liked" and mentioned the most were the conservation appliances and devices (18% to 23%), and references to advertising (i.e., PG&E's promotional assistance, use of logo, ads) and references the ECHome concept provided a good selling point (10% to 27%). There was no mention of the monetary incentives as a feature that was particularly "liked" by builders (MR-78-21). Because the builder wants to sell homes it's logical that the builder will focus primarily on those incentives which get the word out to the consumer about the product and its appealing features.

Past ECHome promotional campaigns appear to have been successful in that they have increased the awareness of potential homebuyers of the availability of ECHomes. In 1980, consumer awareness of the availability of ECHomes rose significantly from 57% in February to 70% in October (MR-80-3).

2.4. Builder Programs Will Work in the Future

Builders will need a competitive edge in the near future. As long as home mortgage interest rates remain high, builders will have to compete more vigorously for the already dwindling number of home buyers. Builders will seek out ways to make their homes more desirable in the marketplace ("In 1980, total California residential sales were approximately 420,000 units, and in 1981 about 325,000 units, compared with a yearly average of 500,000 in the past decade," Bank of America Economic Outlook, California 1982).

As long as household fuel prices remain high, greater home energy efficiency will continue to be an attractive home feature that will be in demand by current and future home buyers. In the survey mentioned above, conducted by Housing Magazine (December 1981), home shoppers list "more energy efficient" as a reason to buy a home by as much as 38% of the shoppers in Chicago and Kansas City, to about 21% of the shoppers in San Diego, Washington, D.C., and Miami. In fact, from a survey conducted by PG&E (MR-80-3), it was found that among PG&E customers planning to move in the next two to three years (who were aware of PG&E's ECHome program), 82% considered the selection of an energy conservation home to be "very" or "somewhat" important.

In addition, it was found in a recent survey of mortgage lenders by the Federal Home Loan Mortgage Corporation (1980) that 59% of lenders consider energy costs in a customer's first mortgage loan evaluation process. This indicates that lenders are concerned about the effect that energy costs will have upon the ability of borrowers to meet monthly mortgage obligations. This is another reason why both builders and home buyers alike have an interest in energy efficient housing.

A likely outcome then, in states that do not have residential standards on a par with California, is that builders will compete by constructing a more attractive and needed product, that is, by building more energy-efficient housing. However, in California, new Residential Building Standards (i.e., Title 24, effective July 1982) will mandate this high level of energy performance, superseding this aspect of building competition.

3. REFERENCES

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TABLE 1. CEC BUILDING STANDARDS AND ECHOME PROGRAM CHANGES

Timetable of Events

<u>Date</u>	<u>Event</u>
1973	ECHomes first introduced, promoting gas appliances, insulation, and weatherstripping.
Feb 1975	California became first state to establish insulation standards in new construction.
Apr 1976	Energy Conservation and Services Department formed at PG&E. Department devoted exclusively to planning and implementing conservation programs.
May 1976	ECHome Program expanded to recognize and encourage a variety of conservation features beyond building codes. These included added insulation, pilotless ignition for certain gas appliances, fluorescent lighting, clock thermostats and shower flow reducers. Change to 50 "point" qualification.
Mar 1978	CPUC approves Premium Energy Conservation Home Program. Program offers monetary incentives with 100 points qualifications.
Mar 1978	California State Energy Building Regulations (Title 24) established, though effective date of many of the requirements were delayed.
Jul 1979	Premium ECHome Program revised to delete items mandated by Title 24 and add energy savings calculations for passive solar features.
Jan 1980	ECHome and Premium ECHome Programs revised and consolidated.
Jun 1981	CEC adopted revised Energy Building Regulations which were eventually scheduled for implementation effective July 13, 1982.
Feb 1982	PG&E winds down ECHome Program in anticipation of revised standards.

TABLE 2. SUMMARY OF ECHOME PROGRAM ACHIEVEMENTS

Year	Energy Conservation Homes Connected	Total New Homes Connected	Market Saturation ^a
1973	()	91,000	()
1974	(25,000+)	78,000	(14%)
1975	()	67,000	()
1976	4,744	79,000	6%
1977	19,471	95,916	20%
1978	35,021	95,000	37%
1979	51,998	93,188	55%
1980	42,630	71,640	60%
1981	34,579	52,448	66%

^a Market saturation represents the percentage of new homes connected that qualified as ECHomes.

TABLE 3. PERCENTAGE OF CUSTOMERS WHO CLAIM TO ENGAGE IN THE FOLLOWING CONSERVATION PRACTICES (AIDED RECALL):

Conservation Practices	ECHome n=307	PECHome n=284	CONTROL n=301
Open/close drapes to conserve heat/air conditioning	90%	90%	88%
Change/clean furnace/air conditioning filter regularly	84	76 ^a	77 ^a
Turn off furnace/heater pilot light in summer	49	76	58% ^{ab}
Turn down water heater temp	54	76	54%
Turn off lights when not in room	95	76	95%
Use caulking/weatherstripping	66	72	69%
Turn off/down appliances/heater when on vacation or out of town	92	76	91%
Only run clothes washer/dryer and dishwasher when have full load	91	76	90%
Usually use cold water for laundry	42	76	38%
Use less hot water	66	76	67%
Don't use dry cycle on dishwasher	37	76 ^a	30% ^b
Close off rooms/shut the doors to rooms when not in use	82	76	75% ^{ab}
Turn furnace off at night when the household is asleep	75	76	75%
Wear sweater around the house in the winter to conserve heat	78	76	80%
Use fireplace more often for heating purposes	64	76	53% ^{ab}
Close fireplace damper when not using fireplace	86	76	61% ^{ab}

^a This percentage is statistically significantly different from the percent in the first column (on the same line) at the .95 confidence level.

^b This percentage is statistically significantly different from the percent in the second column (on the same line) at the .95 confidence level.

TABLE 4. SOME EXAMPLES OF AVAILABLE ENERGY EFFICIENT HOUSING
AND THEIR RELATIVE ENERGY SAVINGS

HOUSING NAME (sponsor)	LOCATION	% ENERGY SAVINGS ^a
EHome (PG&E)	Northern CA	10% to 20%
Blue Skies Radiant Homes ^{b, d} (sponsor unknown)	Hemet CA	24%
Village Homes (PG&E Sunthern home) ^{b, d}	Davis CA	46%
Sunthern Home (PG&E Solar Home Program) ^b	Northern CA	50% ^c
Con Edison Home (Con Edison) ^{b, e}	Briarcliff Manor NY	50% ^c

^a Percentage energy savings in contrast with conventional housing

^b Home equipped with active and passive solar space and water heating systems.

^c Energy savings calculated from engineering estimates and not from actual usage (as are the other estimates listed here).

^d Findings taken from an article by Hamrin (1979).

^e Findings reported in Public Utilities Fortnightly, March 4, 1982.

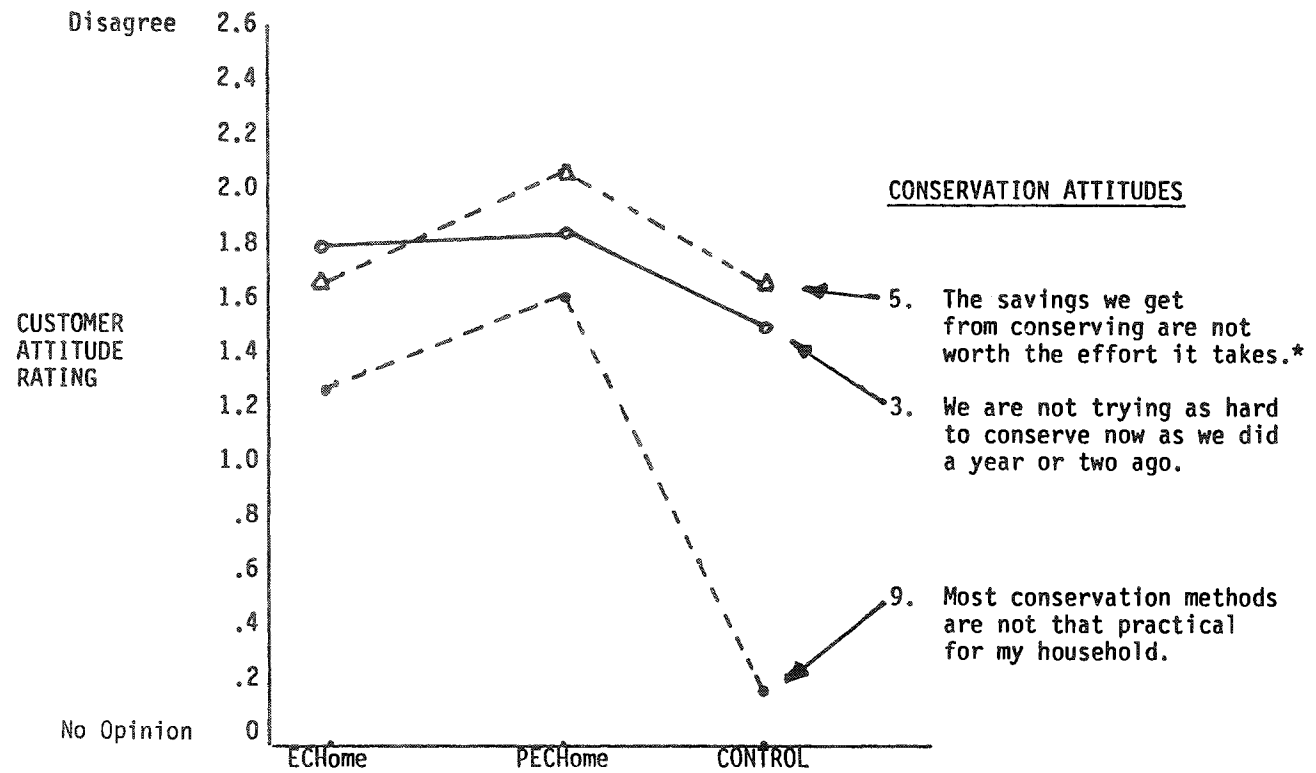


FIGURE 1. Attitudinal trends across the three groups of homes under study (From MR-79-27). The two major factors represented here are practicality and financial savings of household conservation. The values plotted on the graph are means for each attitude per group.

* Responses to this statement were statistically significantly related to the customer's energy consumption.

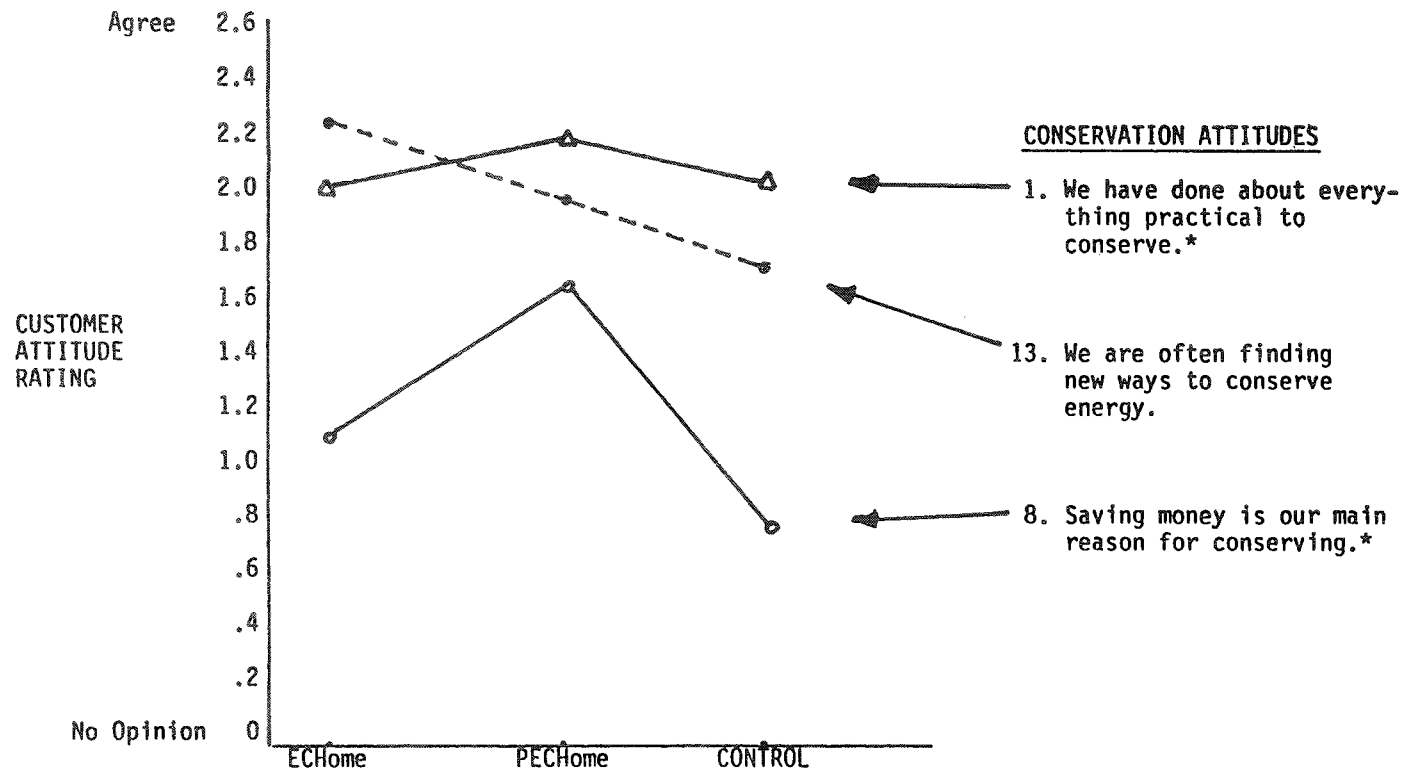
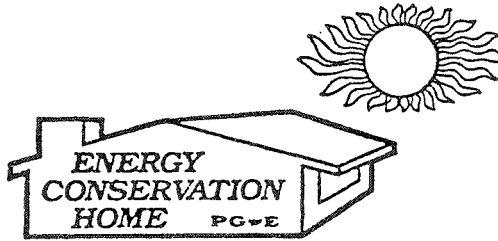


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**ENERGY CONSERVATION
HOME REQUIREMENTS
AND
AGREEMENT**
For Individual or Multi-Family Dwellings

Pacific Gas and Electric Company

**ENERGY CONSERVATION HOME PROGRAM
for Individual or Multi-Family Dwellings**

Standards for Qualification

I. General

The purpose of these requirements is to improve the energy performance of residential dwellings.

II. Minimum Standards

- A. To qualify as Energy Conservation Homes, dwelling units will be rated by a scoring system with points determined by the potential for annual energy savings of three therms of gas or 30 kilowatthours of electricity. Actual savings may be higher or lower depending on individual operation and locality. One point is also given for each 2,000 gallons/year of water savings.
- B. All gas and electric appliances incorporated in the dwellings are to be approved and/or certified by the American Gas Association and/or the Underwriters Laboratories.
- C. Qualification procedure will be as follows:
 - 1. PG&E customer.
 - 2. Minimum number of points per dwelling will be: 50 points
- D. The partial list of energy conservation systems and devices which follows includes alternatives to be considered in the construction of dwellings to Energy Conservation Home standards. Unless otherwise specified, points will only be allowed *once* for any feature, AND WILL NOT BE ALLOWED FOR FEATURES MANDATED BY STATE OR FEDERAL CODES.

A builder may desire to incorporate other energy conserving features in lieu of those listed or may wish to make a specific points calculation for listed items to fit the particular climate zone. See Paragraph II-A when making such calculations. Figures are subject to PGandE verification and approval.



	Points Allowed	Score
(1) Major Appliances:		
Gas Range	13	_____
Oven with light and window	1	_____
Microwave oven	10	_____
Dishwasher with switch controllable drying cycle	5	_____
Gas dryer outlet	10	_____
(2) Space Heating/Cooling		
Set-back or programmable thermostat (not for use with heat pump)	16	_____
Clogged filter indicator	8	_____
Used with air conditioning	10	_____
Air conditioning - 1 point per 0.1 increment in EER exceeding state requirements. Points will only be awarded in areas where air conditioning is required as defined in PGandE Schedule D-1.		
<i>Solar Assisted Space Heating System: One point will be awarded for each 2 square feet of properly located (orientation and tilt) collector</i>		_____
(3) Water Heating:		
Insulation blanket	5	_____
<i>Solar Assisted Water Heating System: One point will be awarded for each square foot of properly located (orientation and tilt) collector</i>		_____
Insulated hot water piping first four feet from water heating unit	2	_____
Insulated hot water piping throughout	5	_____
Showerheads with flow-control devices rated at 2½ GPM or less	4	_____
(4) Weatherization:		
Caulking (per 1,000 sq. ft. of floor area)		
- Exterior sole plate only	7	_____
- Seal all plug outlets only	4	_____
- Total exterior (doors, windows, electrical/plumbing penetrations, sole plate, top plate, plug outlets)	23	_____
Ceiling R-30 (per 1,000 sq. ft. of floor area)		
Heating benefit	5	_____
* Cooling benefit	2	_____
Walls R-19 (per 1,000 sq. ft. of wall area)		
Heating benefit	7	_____
* Cooling benefit	4	_____
Perimeter insulation for slab on-grade floors with moisture barrier (per inch of insulation thickness exceeding state standards)	12	_____
Conventional floors (per 1,000 square feet)		
- R-19 instead of R-11	2	_____
- R-11	10	_____
Double glazing (per 25 sq. ft. window area)		
Heating benefit	3	_____
* Cooling benefit	1	_____
Thermal drapes, moveable insulating shutters, blinds, roller shades, integral louvered screens or other glazing insulation features (per 25 sq. ft. window area)		
Heating benefit	2	_____
* Cooling benefit	1	_____
Reflective glass or film on east or west facing glazing (per 25 sq. ft.)		
* Cooling benefit	4	_____

*Points awarded only in areas where A/C required -- see (2).

	Points Allowed	Score
Insulated exterior doors (per door)		
- 2" wood, solid core	1	_____
- 1 1/2" with solid polystyrene core and thermal break	1	_____
- 1 1/2" with solid urethane foam core and thermal break	3	_____
Attic ventilation (* cooling benefit only)		
- Eave vents with continuous ridge vent	4	_____
- Eave vents with gable vents	2	_____
(5) Chimney (fireplace):		
Positive damper, without gas outlet	3	_____
Fireplace - Glass doors	5	_____
- With heat exchanger	6	_____
- Connected to central space heating ducts	5	_____
- With outside combustion air supply (dampered or used w/glass doors)	2	_____
Free-standing model	10	_____
Air tight wood burning stove	20	_____
(6) Lighting:		
All incandescent and fluorescent fixtures surface mounted	2	_____
Fluorescent Application:		
- Exterior - Porch/Patio	3	_____
- Kitchen area	5	_____
- Laundry area	1	_____
- Bathrooms (all)	7	_____
- Bathrooms (full only)	5	_____
- Recreation or family room	3	_____
- Shop or garage	1	_____
(7) Passive Solar Design Features:		
Heating Benefit:		
House to lot orientation (minor axis within 25° of true south)	15	_____
South facing glass in excess of 25% of total glazing area (per 3 sq. ft.) (Where glazing exceeds 22% of floor area of room being passively heated, room must be protected from excessive heat gain)	2	_____
Evergreen trees providing protection from prevailing winter winds on north, northeast or northwest exposure (per tree, 15 gal. minimum if newly planted)	1	_____
Cooling Benefit:		
Deciduous trees providing summer shade on west, east, or south facades (per tree, 15 gal. minimum if newly planted)	2	_____
Roof overhang or operable exterior awnings on south exposure for each 2 inches exceeding 12 inch horizontal overhang (maximum 32" overhang)	1	_____
(8) Active Solar Design Features (for future adaptation):		
Increased slope on south-facing roof (minimum unobstructed roof surface 8 ft. x 8 ft. with required structure to support future solar panels) (per each 5° over 25° slope, 40° maximum)	2	_____
Rough plumbing for future solar hot water retrofit (must include 2' x 2' minimum space and stubbed control valves for future hot water storage tank)	5	_____
(9) Other		_____
TOTAL POINTS		_____

ENERGY CONSERVATION HOME AGREEMENT

This agreement, made this _____ day of _____, 19 _____ by and between Pacific Gas and Electric Company, a California Corporation ("PGandE") and _____ ("Applicant").

1. Applicant shall incorporate in the construction of _____ Single family _____ multi-family dwelling units located at _____

energy saving features in accordance with the Energy Conservation Home requirements described herein.

2. In consideration thereof, PGandE shall provide the following assistance:

- A. ECH award for each qualifying unit.
- B. For model homes:
 - 1. On-site signs
 - 2. Hi-Lite signs
 - 3. Brochures describing features and benefits of Energy Conservation Homes.

3. Applicant shall install the above mentioned PGandE supplied items at applicant's expense.

4. Applicant will:

- A. Select from the Energy Conservation Home Requirements attached to this supplement a number of conservation features totaling at least 50 points and install these features in each dwelling unit erected or retrofitted in this project. Points will only be allowed for items not mandated by state or federal codes on the effective date of this agreement.
- B. Hold all model homes open for public viewing for a minimum period of two consecutive weekends after completion of construction.
- C. Permit access to each dwelling unit at reasonable times and places, to PGand E representatives, for verification of installation of selected energy saving appliances, devices and systems.
- D. Not refer to, in advertising copy, other promotional material, or verbal representation, any dwelling unit(s) as an Energy Conservation Home unless such dwelling unit(s) qualifies as such under the condition of Paragraph 4.A above.

5. This agreement may be cancelled by either party upon thirty days written notice to the other. If this agreement is terminated for any cause, neither PGandE nor applicant shall be liable to the other for damages or compensation of any kind, provided however, such termination shall not prejudice the rights or liabilities of the parties with respect to any indebtedness then and now owing by either party to the other; and further provided that applicant indemnify PGandE from all claims, or loss arising out of the performance of this agreement.

6. This agreement shall remain in effect for 1 year from its effective date, which shall be the date signed by the applicant hereof.

For PACIFIC GAS AND ELECTRIC COMPANY

For APPLICANT

By _____
Title _____
Date _____
Address _____
Phone No. _____

By _____
Title _____
Date _____
Address _____
Phone No. _____