

PGE2009 RESIDENTIAL NEW CONSTRUCTION PROGRAM

2006 - 2008

1. Projected Program Budget	\$26,264,217
See Tables in Attachment III for components	
2. Projected Net Program Impacts	
MWh	13,357
MW (Summer Peak)	9.015
Therms	2,454,487
3. Program Cost Effectiveness	
TRC	0.82
PAC	1.36

Note: Final MW, GWh and Therms will be added upon completion of Potential Study.

Forecasted impacts for gas savings are incorporated in the Mass Markets; Agricultural and Food Processing; and Fabrication, Process, and Heavy Industrial Manufacturing programs.

4. Program Descriptors

This program targets new residential housing using both PG&E and third party industry specialists to facilitate delivery of a portfolio of energy efficiency services. It will include statewide elements as well as elements specifically targeted to the residential new construction developers and contractors in PG&E's service area.

This program will include a third party offering by Heschong Mahone Group, Inc for Multifamily New Construction. HMG will be implementing this program component for PG&E. This third party program proposes to address barriers to penetration of energy efficiency building design and construction industry practices in the multifamily new construction market. The third party will address the above mentioned market barriers by offering developer rebates, verification rebates, design team rebates, design assistance, sales staff training, engineering analysis of design option paybacks and energy savings. They will be implementing a performance based program for which participating multifamily developments will be eligible to receive the California Energy Star New Homes designation. PG&E will be implementing the single family program component. Single family builders will also have the option of participating in the performance based California Energy Star New Homes program. Both the multifamily and single family programs will remain consistent with the statewide IOU program offering for California Energy Star New Homes.

PG&E will investigate future program options which will encourage builders to participate in the newly approved California Solar Initiative (CSI). CSI funding will become available in 2007.

5. Program Statement

Production builders are generally aware of the impending changes to the Title 24 Building Energy Efficiency Standards effective October 1, 2005. However, there is concern among builders as to which energy efficiency strategies they will be able to cost-effectively incorporate into their projects.

The residential new construction market for both single family and multifamily housing has long been recognized as a potential lost opportunity for long-term energy savings.

The 2006-2008 programs result from a complete reevaluation of existing programs, historical successes, the needs of the market, 2005 Title 24 code changes and the Commission's energy savings targets for 2006 and beyond. The resulting programs use a new and innovative approach to markets and delivery methods to maximize savings opportunities. The programs will have the flexibility to continue to evaluate and adjust based on successes and customer responses.

6. Program Rationale

The California Energy Star® New Homes Program (CESHNP) targets builders and developers for the improvement of energy efficiency in single family and multifamily dwelling units. The California Building Industry Association (CBIA) and the California Energy Commission (CEC) continue to look to the utilities to help in educating builders and other industry participants to advance increased energy efficiency in new construction. The value of this statewide program is greatly recognized by the EPA it has won Energy Star Regional, State and Community Leadership in Energy Efficiency awards for the past three consecutive years.

The RLW 2002 evaluation, measurement and verification (EM&V) study on the CESNHP prepared for California's investor-owned utilities (IOUs), declared the value of the program as follows: "The 2002 Energy Star New Homes program was overall a tremendous success in California."¹ "The Energy Star program has been successful in establishing awareness about energy efficient building measures. In collaboration with the EPA, the Energy Star® logo is a recognized symbol of quality and energy efficient homes. The collaboration between the utilities established uniform services offered to customers. In addition, it allowed for an opportunity to exchange ideas and to combine efforts."²

Though builders will face challenges to exceed code after October 1, 2005, studies show that with education and assistance from utilities and industry consultants. "The results of the interviews with Title 24 consultants revealed the same pattern – the most

¹ Evaluation, Measurement and Verification of the 2002 California Statewide Energy Star® New Homes Program, RLW Analytics, Inc. Phase 1 Report – March 1, 2004, Chapter 1, page 3

² Evaluation, Measurement and Verification of the 2002 California Statewide Energy Star® New Homes Program, RLW Analytics, Inc. Phase 1 Report – March 1, 2004, Chapter 13, page 187

difficult period of adjustment immediately follows the inception of new standards. Over time, builders adjust their practices and accept the new requirements.”³

With increased estimates of single family and multifamily new construction for Northern California, offering a Residential New Construction program continues to meet the needs of:

- California home buyers
- The building industry
- PG&E’s energy efficiency goals

The 2006 program is changing from a performance based only program to a program that offers builders a choice of participating in a prescriptive or performance based program. This is due mainly to the extensive changes in the 2005 Title 24. Recognizing the disparity of the code changes, the performance based program will be based on 15 percent better than Title 24 for both inland and coastal areas. These homes will meet the Energy Star criteria for California. Incentives will be paid based on a per unit basis. This method for paying incentives is consistent with previous years’ programs and was agreed upon by the statewide IOU team. The prescriptive portion of the program will provide rebates for deemed savings measures. Builders can earn incentives for measures which were not used for minimum 2005 Title 24 compliance.

The new program will expand upon the strong base already developed through the past three years of implementing the CESNHP. It will also allow more builders and types of builders to participate (custom builders, small, large production and multifamily builders as well as builder of manufactured housing) in the program. This will allow more residential homes and multifamily projects throughout PG&E’s service area to participate. In 2004 and 2005 the residential new construction program funding was depleted very early. There were several builders and projects which PG&E was unable to consider during the past two-year program. Based on the new program design and targeted measures, the program will remain open longer during the year, allow more builders to participate and increase the number of new, energy efficient homes available for residential customers to purchase or rent within the service area. The residential customer will benefit from lower energy bills due to the increased energy efficiency of their new home or apartment.

High rise multifamily projects, which have unique needs compared to low-rise multifamily projects, will be served best through the calculated program. They often have mixed use of residential and commercial space and would benefit from design assistance. These larger projects also have greater energy savings potential. These types of projects will benefit from the third party multifamily program being implemented by HMG. This third party program proposes to address barriers to penetration of energy efficiency building design and construction industry practices in

³ Residential New Construction Baseline Study of Building Characteristics, ITRON August 17, 2004, page 7-4

the multifamily new construction market. The third party will address the above mentioned market barriers by offering developer rebates, verification rebates, design team rebates, design assistance, sales staff training, engineering analysis of design option paybacks and energy savings.

This market integrated demand side management program will address current market needs and barriers. It can also quickly respond to changes in the specific sub-markets and to new technologies and energy end use practices. This approach will allow PG&E, in conjunction with customers and industry specialists, to maximize market energy savings.

Program managers will be able to track and respond to industry trends, adjust the size or direction of the program within the portfolio and take full advantage of new technologies or practices across all customers in a specific segment of the market. This will also enhance and strengthen the relationships among contractors, industry specific consultants, end-use specific experts (e.g., refrigeration), trade organizations and other industry experts.

7. Program Outcomes

- Implement a simpler, more cost-effective, more successful program by eliminating confusing program overlaps and by gaining increased builder participation;
- Increased participation from multifamily builders and projects due to the third party program which will be implemented by HMG.
- Capture energy efficiency opportunities for new construction in all geographic areas of PG&E's service area;
- Target 10 new builders (all builder types that are not currently program participants) as participants in the program;
- Promote all energy options that may be applicable across an industry segment;
- Successful development and implementation of an upstream incentive program for manufactured housing.
- Provide training courses on new programs and technologies from the education and training program that target the building industry.

Residential customers who purchase new homes or live in multifamily residential facilities will directly benefit by saving energy due to the increased efficiency of new single family and multifamily homes.

8. Program Strategy

California's population continues to grow as does the need for new housing. At the same time California continues to be a leader in residential building standards. Energy efficiency has been identified as an important factor for builders in marketing their homes. Builders also confirm that energy efficiency features and Energy Star marketing helps to differentiate their homes from their competitors. Awareness by home-buyers of the importance of energy efficiency will lead to higher demand for energy efficient homes and the desired response from builders to meet demand.

Working together with builders, developers, architects, energy consultants, and other building industry professionals, this program will seek to increase energy savings which will be achieved through a combination of education, design assistance and financial incentives. This program will promote energy efficiency measures in new, single family, multifamily homes and manufactured housing. PG&E will focus on the implementation of the single family program as we have developed successful relations with production builders and developers. HMG will focus on the implementation of the multifamily component. This third party program proposes to address barriers to penetration of energy efficiency building design and construction industry practices in the multifamily new construction market. The market barriers will be addressed by offering developer rebates, verification rebates, design team rebates, design assistance, sales staff training, engineering analysis of design option paybacks and energy savings.

The program develops new, energy efficiency approaches and works directly with builders to achieve the introduction of energy efficiency in new homes. Measures and practices have included shell and equipment improvements, as opportunities based on current Title 24 evolve.

The program will expand by offering an upstream manufactured housing component. PG&E is proposing to have this program component developed and implemented by a third party. The other IOUs have expressed an interest in offering a manufactured housing program component on a statewide basis. Builders can also receive financial incentives for increased energy efficiency.

Three main categories of measures or practices are being incented. The measures impacting cooling use are chosen based on high energy savings and low penetration rates. The ability to further reduce critical peak cooling use in the Central Valley is important because this area continues to exhibit population growth. Quality-of-installation measures are also chosen because of the energy savings and the potential to transform the quality of installation in the retrofit market. Many HVAC contractors and insulation companies work in both new construction and retrofit markets. Appliance packages and lighting measures enable PG&E to leverage its marketing efforts between new construction and the mass market program.

The program will influence developers and contractors to change construction design, materials and techniques by providing education, training, and information to familiarize the developers, contractors, designers and consultants with all new energy

efficiency equipment and practices as they are developed for the industry. A specific emphasis will be placed on smaller builders and builders of manufactured housing to increase their participation in energy efficiency opportunities.

9. Program Objectives

The programs objectives include increasing energy efficiency in new single family and multifamily homes above state standards. In a recent strategy assessment report, builders were surveyed and the majority believed that energy efficiency is an important factor in marketing their homes currently. Also, a large percentage responded that they believed that the importance of energy efficiency in marketing new homes will increase with the implementation of the 2005 changes to Title 24. The program will maintain this focus on energy efficiency.

10. Program Implementation

The market integrated approach will allow PG&E and HMG, a third party who was selected to implement the Multifamily New Construction program within PG&E's service area, to offer multiple services to all participants in the residential new construction industry. This coordinated approach is designed to maximize participation, ensure quality construction and provide long-term energy savings.

PG&E maintains strong community ties and well-developed relationships with many large production builders, local building industry associations and organizations. The program implementation team comprised of PG&E field personnel will continue to work closely with builders, developers, energy analysts, and builder trade professionals to implement the new construction program. The implementation team will market the program to builders, provide feasibility analysis, and assist with program documentation and application requirements. PG&E will coordinate with other internal energy efficiency programs such as the Mass Market program to ensure delivery of program elements that pertain to the new construction market such as HVAC services and appliance packages for builders to offer to new home buyers. PG&E will also coordinate on a statewide level with the IOUs on specific program components that will be offered consistently statewide.

To facilitate the continual improvement of California's minimum efficiency standards in new construction (Title 24), training will be provided to builders, contractors, and consultants to educate them on the new 2005 Title 24 requirements. The sooner these professionals are familiar with the code, the sooner all purchasers of new homes will be able to take advantage of the energy savings it provides.

Special attention will be paid to small builders, custom home builders, multifamily builders and builders of manufactured housing. While these program participants produce fewer homes, they often have the advantage of individual owners or renters who will benefit from the advantages of energy efficient construction. The Multifamily

New Construction program which HMG will implement will focus on addressing and overcoming the market barriers specific to the multifamily market.

This program will coordinate closely with other efforts, such as the emerging technology program which will allow builders to test new products on a pilot basis.

Builders will have a choice whether they want to participate in the prescriptive or calculated component. Builders who participate in the calculated component will also have the option of adding Energy Star appliances and lighting measures from the prescriptive component.

Builders will have a variety of prescriptive/deemed measures to choose from to include in the overall design and installation of new homes they are constructing. They can choose one or all measures. (Builders earn incentives for measures which were not used for minimum 2005 Title 24 compliance.) They can maximize energy savings and earn additional incentives by choosing packages of energy savings measures such as the appliance package (installing all three proposed measures) or upgrading air conditioning systems in each home and combining the quality installation of air conditioning equipment with charge and air flow.

- Night ventilation systems – This new/emerging technology will be targeted to single family homes in climate zones 2, 4, 11, 12 and 13. This is a residential economizer which uses nighttime cool outside air rather than mechanical cooling.
- Tankless gas water heaters – This new/emerging technology offers a combination of training and incentives to educate builders and to encourage them to include this measure in new homes. This product is also applicable to multifamily new construction with and without central water heaters. The equipment also has the potential to reduce water waste by 90 percent. Plumbing design, pipe insulation, demand recirculation and heat gain recovery are part of this package. Coordination with Mass Market program will encourage distributors to market this product to builders and consumers.
- HVAC equipment – High EER air conditioning units, heat pumps, plus quality installation and tune-up service, will be offered to builders. These measures will be integrated with and offered in conjunction with the Mass Market program. This offering will promote quality installation practices to builders, HVAC contractors, and vendors through providing increased education and outreach to that industry. Quality installation is critical to highly efficient equipment operation, increased energy savings, and reduction of the critical peak demand during the summer months.
- Appliance package – High efficiency refrigerators, clothes washers, dishwashers and gas clothes dryers will be combined for builders to offer as an appliance package to new home buyers. Coordination would be done with manufactures and distributors who supply appliances to builders for installation in new homes. Builders can chose to offer the appliance package to new home buyers as an

upgrade item at their design centers. These measures will be integrated with and offered in conjunction with the Mass Market program. Builders have expressed an interest in offering appliances to home buyers, especially clothes washers, as they are also coordinating with local water agencies.

- The program will also focus on promotion of high efficacy lighting products in high utilization areas of new homes. The new 2005 Title 24 code requires that builders install high efficacy lighting fixtures or controls to meet code. An incentive would be available to builders who design and install high efficacy lighting fixtures and controls which used together will exceed Title 24 requirements. The program will work with builders, their architects, lighting designers and contractors to install high efficacy-fixtures and controls throughout new homes.
- High efficiency furnaces 92-94 AFUE with and without variable speed fans – This measure provides energy savings on space heating which is the largest use of natural gas in the residential sector. This measure encourages upgrades of high efficiency heating equipment in cooler climates where heating is used more frequently. Savings from high efficiency furnaces vary depending on climate, size of the home, usage patterns and local cost of fuel.
- Insulation installation credit – This measure will contribute to the overall improvement and quality of the thermal building envelope. This measure focuses on the proper installation and specific R-Value recommendations by climate zone of ceiling, wall and floor insulation. Builders can earn an incentive by providing documentation such as the insulation installation checklist completed at the building site by the insulation contractor which ensures that insulation is properly specified and installed, resulting in a more comfortable and energy efficient home. A builder will earn the incentive for this item as long as it's not taken for minimum Title 24 compliance.

2006 DEEMED MEASURES	Proposed Rebate Amount
Night Ventilation Systems (single family homes only)	\$250-\$500 unit
Tankless Gas Water Heaters*	\$200 system
HVAC Equipment*	\$125-\$250 system
HVAC – quality installation tune- up services, refrigerant charge & air flow.*	\$40 unit
Tight Ducts*	\$250 system
Appliance Package (clothes washer, gas dryer, dishwasher and refrigerator) *	\$35-\$75 unit
High Efficacy Lighting (beyond 2005 T-24 requirements)*	\$10-fixture
High Efficiency Furnaces	\$100-\$250unit
Quality Installation Insulation Credit *	\$50-\$150 home

2006 CALCULATED MEASURES	Coastal Climate Zones 1-7	Inland Climate Zones 8-16
CA Energy Star New Homes Single Family* 15 %	\$400 per unit	\$500 per unit
CA Energy Star New Homes Multifamily* 15%	\$150 per unit	\$200 per unit

* These measures are being offered consistently by IOUs through their Residential New Construction program.

The residential new construction program will be one component of an integrated marketing and outreach strategy. A variety of channels (e.g. fact sheets, case studies, seminars, brochures, advertisement, direct mail, articles) will be used as appropriate both to inform the general customer audience and to appeal to niche markets. Particular emphasis will be placed on Web-enabled information and assistance.

11. Customer Description

Customers are builders, especially small custom home builders as well as large production builders of single and multifamily residential facilities, manufactured housing builders, energy analysts, architects, developers, Title 24 consultants and consumers in the market for a new home.

In 2004, PG&E's CESHNP committed more than 4,112 single family units and 767 multifamily units resulting in a total of 961 MWh of net annualized energy savings, 1.03 MW of net peak load reduction and 507,602 therm savings. The potential for new home construction in California for 2006 is based on building trends and forecasts from the California Industry Research Board. Housing permits increase on an average of 3 percent per year. For 2006 there are approximately 140,000 single family and 60,000 multifamily housing units forecasted for the entire state. Of those statewide permits, 50 percent will be single family homes and 30 percent will be multifamily units to be built throughout Northern California. There continues to be a huge opportunity for PG&E to continue to influence builders of new homes as housing starts continue to increase, to assist customers with energy efficient solutions, and contribute towards the state's and utilities' collective goals of reducing kWh usage and load demand.

Currently, the award-winning CESHNP is a performance-based program that encourages and assists builders to incorporate energy efficient technologies and design in the homes they construct to exceed the California Title 24 Energy Efficiency Standards by a minimum of 15 percent.

In California, homes built to current Title 24 standards are 15 percent more efficient than homes built to the federal government's standards. This is due in part to the adoption of AB970 and subsequent revisions to Title 24 in 2001. Effective October 1, 2005 the California Energy Commission (CEC) will again make significant changes to

energy code standards that will raise the efficiency requirements of California homes. These new requirements will increase the standards by an additional 15 percent for new homes built in California. That said, California's building codes will exceed the rest of the nation by 30 percent. These new standards will be challenging and more costly to meet compared to the existing standards.

At this time, single family and low-rise multifamily builder projects meeting the program requirements will also meet the requirements of the U. S. Environmental Protection Agency (EPA) Energy Star[®] Homes Program. Currently, the EPA has proposed changes to the Energy Star[®] specifications for new homes and are expected to be finalized during the 3rd quarter of 2005, at which time the utility may adjust program requirements. (The EPA does not currently recognize high rise construction with the Energy Star label. The information gathered as a result of this program is shared with the EPA Energy Star[®]. The EPA is interested in the outcome of this program activity for possible future Energy Star[®] designation of multifamily buildings that are four or more stories.)

12. Customer Interface

PG&E will present the Residential New Construction program to customers, builders, developers, Title 24 consultants, industry trade vendors, architects, and other building industry personnel through various channels including but not limited to, new construction field representatives, advertisements in trade journals, a New Construction Web site and customer/builder hotline. PG&E will continue to promote program participation using strategic alliances with field representatives, subcontractors, and industry trade vendors who will work directly with the builders. The integrated market DSM portfolio will provide customers, builders and developers easy access to energy efficiency options as well as appropriate options for demand response and distributed generation.

13. Energy Measures and Program Activities

13.1 and 13.2

Incentive levels for the targeted market programs are being developed to reflect current market conditions. Energy measures and required data are provided in the cost-effectiveness calculator.

13.3. Non-energy Activities

13.3.1. End Use Load

- Residential new construction whole building, multifamily common use area lighting and HVAC.

- Residential building shell and equipment.
- Focus on residential cooling equipment in the Central Valley.

13.3.2. Targeted Sector

Residential new construction builders of both single and multifamily homes, builders of manufactured housing, energy consultants, home energy rating system (HERS) raters, architects, building inspectors and other industry professionals.

13.3.3. Activity Description

The Residential New Construction program will continue to offer extensive training courses on emerging new technologies for the building industry, including courses on Title 24 code changes, quality of insulation installation for contractors, and pilot programs relevant to building energy efficiency into new homes. Other activities include attendance at building industry trade conferences/outreach events and contractor/builder field visits as necessary. The target audience consists of builders, developers, energy consultants, HERS raters, architects and other industry professionals.

13.3.4. Quantitative Activity Goals

As required in the Energy Action Plan, Decision 04-09-060, the Energy Saving Targets Decision, Decision 05-04-051, and Policy Rules II.1 and II. 2, the focus of all activities in the program will be to promote and produce energy savings.

13.3.5. Assigned attributes of the activity

Appropriate end uses for residential new construction customers

13.4. Subcontractor Activities

PG&E's portfolio of programs will integrate third parties as well as partnerships into each program, as needed. The consultants and the staff selected will have extensive knowledge and experience in all areas of energy code compliance, HERS verifications, and construction practices as they relate to the energy code. Residential New Construction third-party contractors will directly assist in builder outreach, design assistance, plan check procedures and field verification. These services will be utilized to review all project submittals to ensure that they meet both minimum state code energy compliance (Title 24) and the CESNHP program criteria. PG&E plans to solicit third party bids for the following residential new construction program elements:

- Development and implementation of an upstream manufactured housing component;
- Design assistance, training and implementation of the multifamily new construction for low rise and high rise units; and
- A lighting component that exceeds minimum code requirements for new homes.

13.5. Quality Assurance and Evaluation Activities

PG&E will continue the level of quality assurance of the present programs including pre-inspections for larger or specialized projects and post-inspections on all large projects and a percentage of smaller projects similar to 2004-2005.

The Residential New Construction Program has verification activities and evaluations in place to ensure the program runs efficiently and cost-effectively. Independent consultants will carry out unbiased verification, review and quality assurance of projects. PG&E program administrators will also review and quality-check consultants' reports and customers' applications. Independent consultants' process, impact and overarching evaluations and program tracking data will be used to ascertain the effectiveness of program intervention strategies in meeting customer needs and overcoming market barriers.

Evaluation will build upon the data gathered during the program interventions, i.e., audits, design assistance of new construction, commissioning and retro-commissioning. Independent consultants will review and conduct quality assurance on the data. The independent consultants will also supplement the data as needed to carry out the analyses to determine program success at garnering energy savings opportunities and assisting in the development of mature markets for energy efficiency.

For measurement of energy savings, a detailed EM&V plan will be developed by an independent consultant that will select methods that are consistent with the currently adopted set of measurement rules at the time the detailed plan is developed. Either in this evaluation or in an over-arching statewide study, the ex ante energy and demand savings estimates will be reviewed, and new ex post estimates will be developed where there is found to be a need for additional measurement to assure accurate savings estimates. Changes in manufacturer and distributor stocking practices of energy efficiency equipment, as well as the home developers and design-community will also be assessed, and the program logic model updated if needed. Savings estimates will be updated to reflect the best available information, as needed.

- **Market Assessment and Customer Behavior Analysis:** These tasks will assist in assessing customer awareness, behaviors and practices given their participation in the Residential New Construction Program. The data used will be drawn from the process evaluation survey of customers and from the verification data collection. The market

saturation/market share/potential data from statewide studies currently underway will be another primary source of information for market assessment and baseline analysis

- Interim Impact Assessment and Feedback Analyses: These tasks will provide ongoing feedback to program managers on the impacts being achieved. Focus will be on identifying early on both measures that are capturing large savings opportunities and those that are not progressing; to enable timely program changes.

13.5.1. Expected Number/Percent of Inspections (planned percent of projects)

The Residential New Construction Program will adopt a rigorous inspection plan that will ensure that calculated and deemed measures are installed and operational.

13.6. Marketing Activities

Program marketing and outreach will be achieved through a variety of channels, including direct mail of program materials to builders, fact sheets, brochures, point-of-purchase materials, articles, case studies and advertisements in various trade magazines. There will be particular emphasis placed on Web-based information and assistance to both builders and consumer in the market for new homes. Additionally, PG&E will also directly market to the local and regional building industry associations, affordable housing associations, and other associations and organizations related to single and multifamily residential new construction markets. PG&E will continue its presence by attending and exhibiting in key industry events, such as the Pacific Coast Builder Conference, which offers opportunities to promote the program. Finally, PG&E will seek to educate and inform customers most effectively through bill inserts, Web site and community events that educate consumers about the benefits of energy efficiency in their homes.

14. Conclusion

This market integrated DSM program compliments the rest of PG&E's portfolio, contributes to the overall balance of the entire portfolio and is designed to achieve the Commission's energy savings targets.

15. Appendices

Documents shared with PG&E's Public Advisory Group and at the Public Workshops on the development of PG&E's 2006-2008 portfolio can be found on PG&E's Web site at http://www.pge.com/rebates/program_evaluation/advisory_group/.