Residential HVAC Quality Maintenance (QM) Program: Customer Research

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LEGAL NOTICE

ABBREVIATIONS AND ACRONYMS

AC	Air conditioning
ACCA	Air Conditioning Contractors of America
HPi	HINER & Partners, Inc.
HVAC	Heating Ventilating and Air Conditioning
PG&E	Pacific Gas & Electric Company
QM	Quality Maintenance

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EXECUTIVE SUMMARY

The HVAC Quality Maintenance (QM) is a service provided by participating HVAC contractors whereby the customer receives complete verifiable service of the HVAC system.

PROJECT GOAL

Pursuant to the further development and marketing of the HVAC Quality Maintenance (QM) program, PG&E conducted customer research with the objectives to: (1) understand customers' existing knowledge, concerns, and experiences with their HVAC systems, (2) gauge customer reactions to the HVAC service agreements, and (3) what do customers perceive to be the "optimum" features and cost for the service agreements.

PROJECT DESCRIPTION

To achieve the assessment objectives, HINER & Partners (HPi) completed: (1) one-on-one interviews with residential HVAC contractors, (2) qualitative focus groups among residential customers, and (3) a quantitative survey among customers in PG&E's targeted climate zones who have HVAC systems.

The purpose of the contractor interviews was to understand the barriers to the adoption of Standard 4 compliant service agreements, selling practices for the agreements, and interest in the proposed PG&E-backed HVAC Quality Maintenance (QM) incentive program. The focus groups were used to uncover customer beliefs, while the quantitative survey measured the prevalence of these beliefs in the target population.

PROJECT RESULTS AND RECOMMENDATIONS

Results and recommendations are categorized for three purposes: targeting, program design, and marketing.

Targeting

There are three residential customer segments for targeting purposes:

1) Customers with existing HVAC service contracts. These customers are clearly onboard with the intent and benefits of the HVAC QM program, and might become "free riders" since they already pay market rates for AC maintenance.

2) Customers who don't believe in AC service. Customers who are against regular AC maintenance are distrusting of contractors. These customers might be difficult to convince unless the design of the program and/or marketing can overcome their distrust.

3) Customers who "don't know." These customers represent a blank slate in need of considerable education about the benefits of maintain their HVAC systems.

Program Design

Regarding program design, customers have a slight preference for: (1) an assessor who does only assessment (but customers with an existing contractor relationship prefer their own contractor who is full-service), (2) rebate is paid to the contractor rather than the customer, (3) service maintenance visits are once a year (rather than twice), and (4) maintenance service is optional, not mandatory.

Regarding costs, customers want the initial visit not to cost more than $75 (after rebate), and service maintenance not to cost more than $100 per year (after rebate).

Marketing

Top program benefits are: (1) saving money on their PG&E bill, (2) increasing comfort of their home, (3) saving energy, and (4) increasing longevity of their central AC. These benefits can be included in program messaging.

Customer communication preferences include: (1) direct mail from PG&E, (2) a PG&E website, (3) email from PG&E, and (4) PG&E bill inserts. Customers are less interested in hearing about the program from contractors. In sum, program messaging should come primarily from PG&E.

To find a contractor, customers want to use one they've already worked with, or to get one by referral from a friend or from PG&E. Program marketing should leverage contractors existing relationships (for customers who already work with a contractor), and provide referrals to approved contractors (for customers without).

INTRODUCTION, BACKGROUND, AND TECHNOLOGY

The HVAC Quality Maintenance (QM) is a service provided by participating HVAC contractors. The customer receives complete verifiable service of the HVAC system. If they choose to sign a service agreement that is compliant with ACCA Standard 4 they will typically have two service calls per year – once in the spring before the cooling season and once in the fall before the heating season – that serve to support persistent savings and safety.

The QM service includes two components: (1) ACCA Standard 4 measures: an assessment and inventory of the existing system, safety check, evaporator and condenser coil cleaning, and other activities as required; and (2) HVAC energy efficiency treatments, including duct system capacity improvement, duct refurbishment, duct insulation, refrigerant charge, evaporator fan motor retrofits, and condenser motor retrofits.

The market transforming goal is for the customer to develop a long-term relationship with the program certified HVAC contractor so that the efficiency of the HVAC system is optimized over the long run by implementing all of the corrective actions that the system needs (in contrast, other programs have implemented just one or two measures across as many units as possible).

ACCA QM Standard 4 was published in 2008 as an industry consensus standard but until PG&E decided to make it the focus of its enhanced HVAC maintenance program it was not being applied. Few if any contractors are even aware of the standard and no consumers were aware of its existence. This makes it an Emerging Technology that supports new and enhanced actions that improve the efficiency of existing residential HVAC equipment. As is often the case this emerging standard applies to an existing marketplace. It is bringing order to a confused situation where customers are inundated with advertising and specials for "tune-ups". The advertisements highlight long lists of items the technicians will do of which some are of marginal value. Some customers have purchased service agreements and home warranty policies which promise a long term relationship and a level of protection but the results are mixed and confused by the lack of a standard. It is critical that a program designed to facilitate the widespread adoption of the ACCA Standard 4 has information on how customers understand HVAC maintenance, their experiences with it and what they perceive is needed. This study conducts the research needed and the results will used in the design and implementation of the Residential HVAC Quality Maintenance product offered by PG&E.

The overarching benefit is that customers will receive the energy savings from having a properly functioning HVAC system, while avoiding the loss-leader AC tune-ups that some HVAC contractors currently offer to attract new business. Additionally:

- Airflow problems are corrected
- Equipment is brought to a level of efficiency that approaches its rating
- Safe operation is maintained
- Equipment lasts longer
- Pending failures are detected early, and failures at times when the customer needs their HVAC the most are avoided
- Information about energy saving actions is provided
- Customer is empowered to maximize their cost effective savings.

ASSESSMENT OBJECTIVES

Pursuant to the further development and marketing of the HVAC Quality Maintenance (QM) program, PG&E conducted customer research with the following objectives:

- Understand customers' existing knowledge, concerns, and experiences with their HVAC systems:
  - Do they think their systems are efficient? Why or why not?
  - Are they interested in improving the efficiency of their systems? Why or why not?
  - What do they think about AC tune-ups or AC service contracts? What are the positives? What are the negatives? What are the barriers? Do they know about ACCA and/or Standard 4?

- Gauge customer reactions to the HVAC service agreements:
  - What would motivate them to sign up for it?
  - What are the barriers to signing up?
  - Is it important that there is a national standard?
  - How should the service agreements be marketed?

- What do customers perceive to be the "optimum" features and cost for the service agreements?
  - How can the program be "optimized" for maximum appeal (and participation)?

RESEARCH METHODOLOGY

To achieve the assessment objectives, HINER & Partners (HPi) conducted qualitative focus groups followed by a quantitative survey among customers in PG&E's targeted climate zones who have HVAC systems. Focus groups were used to uncover customer beliefs, while the quantitative survey measured the prevalence of these beliefs in the target population. The research was completed among residential customers. Subsequent research among small and midsize business customers is also planned.

HPi also completed one-on-one interviews with residential HVAC contractors. The purpose of these interviews was to understand the barriers to the adoption of Standard 4 compliant service agreements, selling practices for the agreements, and interest in the proposed PG&E-backed HVAC Quality Maintenance (QM) incentive program.

CONTRACTOR RESEARCH

The first stage of the research was interviews with contractors. Six in-depth one-on-one interviews were completed among residential contractors who had not participated in PG&E's contractor forums but who may have participated in past QM programs such as DTS and RAC.

- Contractors were recruited from PECI and PG&E's existing contractor lists. Three of the contractors were current participants in PG&E's existing HVAC program(s), and three of the contractors were not current participants.

- Additional screening criteria included: (1) contractors had been licensed for at least 5 years, (2) they perform both HVAC maintenance and installation, and (3) at least 30% of their business was among residential customers.

- Interviews were completed by telephone by Dr. Steve Westberg, HPi's lead researcher and project manager.
    - Each interview was approximately 45 minutes long.

- HINER & Partners recruited contractors for the interviews by telephone, and prescheduled the interviews at times convenient to the contractor.

- Contractors were given a $150 incentive for participating in an interview.

- Each interview was audio recorded and transcribed.

The interview discussion topics included:

- Introductions
- Contractor background
    - Licenses
    - Association memberships
    - Participation in other PG&E programs

- Service Agreement Discussion
  - Do you offer them?
  - If yes: Why? Benefits to contractor? Benefits to customer?
  - If no: Why not?
  - How do you promote or "sell" service agreements?
  - What do you charge? How did you determine the amount?
  - What do you do at renewal time to encourage continuation of the agreement?
- ACCA membership and perceptions about
- The PG&E Program
  - Description of program: What do you think about it? Likes? Dislikes?
  - Would you participate?
  - Why? Why not?
  - How can it be improved?
  - How would you promote this program?
  - How much would customers be willing to pay? How much would you need to charge?
  - What else could PG&E do to ensure success of this program?

QUALITATIVE CUSTOMER RESEARCH

Six focus group sessions were held among targeted residential customers. The focus groups were conducted at centralized facilities in three different market areas.

- Residential customers met the following criteria:
  - Have summer energy bills of $400 or more
  - Live in a home built more than 5 years ago
  - Included a mix of those with existing HVAC service agreements and those without, and those who have had a service call in the past (cost of about $300 or more) and those who have not.

- The sessions were held at three centralized locations in PG&E's service territory in the targeted hot climate zones, with two groups at each location. The residential locations and dates are shown below. All focus groups were held at a Nichols Research facility in these locations.

Location	Date and Times
Fresno	May 19, 2011; 6 and 8pm
Concord	May 23, 2011; 6 and 8pm
San Jose (Sunnyvale)	May 24, 2011; 6 and 8pm

- Each of the sessions was about 2 hours long.
  - All groups were moderated by Dr. Steve Westberg. Dr. Westberg has 15 years of experience conducting qualitative interviews with energy utility customers on a wide variety of topics, including groups covering topics that are similar to this project.

- PG&E provided lists of customers who resided in the vicinity of the focus group locations, with bill amounts of $400 or more. Customers from the lists were called by Nichols Research to ask the additional screening questions and invite those who qualified to a focus group. Nichols recruited 12 customers for each group, with the expectation that 8-10 would actually attend.

- Customers were given a $100 incentive for participating.

- Focus group sessions were streamed live online through FocusVision. This allowed PG&E team members to watch the groups and chat live, thereby avoiding time consuming and costly trips to each location. A few PG&E team members did attend the sessions in person. Sessions were audio and video-recorded and the audio was transcribed to create a verbatim reference.

The focus group discussion topics included:

- Introductions
- HVAC Discussion
    - What have you done to reduce energy use in the home?
    - What do you know about your home's HVAC system?
        - Age? Efficiency? Condition?
    - What affects the efficiency of the HVAC?
    - What do you do to maintain and care for your home's HVAC?
        - What is the benefit of doing that?
        - Why did you start?
    - If you don't do anything, why not?
    - What have been your past experiences with HVAC repairs?
    - What do you think about HVAC contractors?
        - Past experiences?
        - Positives?
        - Negatives?
- HVAC QM Program Discussion
    - A description of program was shared
    - What do you think about this program?
        - What do you like?
        - What don't you like?
        - What could be improved
    - Would you participate?
        - Why? Why not?
    - How much should the rebate or incentive be?
    - How should this program be promoted?
        - What information would you want?

QUANTITATIVE CUSTOMER RESEARCH

Following the focus groups, HPi completed an online survey among a sample of PG&E customers who fit the target criteria: (1) homeowners, (2) residing in single family homes or duplexes, (3) with central HVAC, (4) located in targeted climate zones (2, 4, 11, 12, 13), (5) not employed by a utility or marketing firm, and (6) knowledgeable about their PG&E gas and/or electric service. Additional details include:

- Respondents to the survey were provided from an online panel maintained by the panel company Research Now (formerly e-Rewards), headquartered in Dallas Texas. Respondents were further screened to ensure they fit the targeting criteria.

- Sample size was n=410 qualified residential customers.
- The interview was approximately 25 minutes long.
- Interviewing was completed between July 5 and July 11, 2011.
- The interview included a conjoint analysis, which is comprised of trade-off tasks that can identify the "optimum" program attributes vs. cost to the customer.

The quantitative survey topics included:

- Screening questions
- HVAC Perceptions, Knowledge, and Practices
  - Subjective evaluation of effectiveness and efficiency of their HVAC
  - Interest in improvements
  - Interest in maintenance
  - Age, characteristics, and typical usage of the homes' HVAC system
  - Current maintenance practices
    - Self and professional
    - Amount paid for tune-ups and repairs (if any)
  - Enrollment in maintenance service agreements
    - Services provided
    - Amount paid
- HVAC QM Program Review
  - Initial customer response
  - Likes and dislikes
  - Concerns
  - Conjoint Analysis based on proposed program "features"
  - Max Diff choice tasks based on program benefits
- Information source preferences
- Demographics and home characteristics

Copies of the discussion guides and quantitative research instrument are in the Appendix.

RESULTS

Results from the HVAC contractor interviews, the residential customer focus groups, and the residential online quantitative survey are presented in the following sections.

CONTRACTOR RESEARCH

Key findings from the 6 contractor interviews are summarized below. Implications for program design and marketing are also discussed.

GENERAL OBSERVATIONS ABOUT CONTRACTORS

The 6 contractors included 3 who are current participants in a PG&E HVAC program and 3 who are not. Based on this handful of interviews, the participants, compared to the non-participants, are: (1) bigger, more established companies, (2) with more defined service agreement plans, and (3) with more organized and consistent processes and procedures for marketing/promotions and maintenance.

Two of the participants, both larger businesses in their areas, suggested that PG&E should exclude smaller contractors from the program. Their rationale is that PG&E should concentrate its resources (e.g., money) with a few strong, proven performers who can partner with PG&E. There might be some truth in these comments: the stronger performers already: (1) train their employees to specific standards (though none were familiar enough with ACCA 4 to believe they meet this standard), and (2) regularly market themselves and their service offerings so they are able to leverage incremental co-op money to greater effectiveness.

- One of these contractors used the analogy of buttering bread with just a small pat of butter. It works better if you spread it on just one piece of bread rather than the whole loaf.

- Both of these contractors expressed their belief that they more likely to implement the program properly to achieve the intent and goals of the program because their companies already do tune-up visits and maintenance in a way that is consistent with the program.

    - One described this as a focus on quality, not quantity. He felt that other PG&E programs incented contractors to do as many as possible in the least amount of time. This, he felt, was contrary to a program that would really improve the efficiency of each system.

However, virtually all of the contractors expressed an interest in participating in the HVAC QM Program – and the smaller contractors do have many existing customers with whom they have long-term relationships.

- Among the three non-participants who were interviewed, at least two of them expressed some ambivalence to actually going through all the requirements needed to participate in utility programs in general, so even though the HVAC QM program sounded appealing to them, they may not actually participate when the time comes.

SERVICE AGREEMENTS

All six respondents offer service agreements of some type. Those with defined, formalized service maintenance plans tended to be the larger contractors, while "mom-and-pop" shops tended to have informal agreements or "service lists." Formal maintenance plans typically include:

- Twice yearly visits (late spring and late fall are the ideal times)
- Discounts on labor rates (one contractor mentioned a 25% discount) and possibly parts
- Priority service or "head-of-the-line" privileges for repair work (since repairs are typically needed during the heat of summer or the cold of winter this can be an important benefit)
    - One mentioned "guaranteed service within 24 hours."
- An on-going relationship with the same technician who gets to know the system over time
- Payments made typically twice a year, usually at the time of service
- Customers can drop at any time – they are not obligated to continue if they do not want to

At least two of the contractors offer more than one type of plan to give customers choices. One contractor described one of their plans as: a 3-year plan for $48 down and $52 for each visit done twice a year but parts and consumables are not included. Another offers three "levels" – each level includes the same cleaning and adjusting with each visit, and the same number of visits (2 per year), but higher plan levels include greater discounts off repair services that might be needed. In a way, these higher level plans are hybrid insurance plans.

Contractors mentioned the benefits to customers of "peace of mind" and "security" from having a "trusted source" for energy solutions (e.g., AC repair and maintenance).

- A couple also mentioned avoiding higher repair bills, although most of the contractors admitted they do not make much money from maintenance agreements. They offer agreements with the expectation that when the system breaks down, they will get the call for the repair.

The companies that offer the more formalized plans also described their first visit as going beyond "standard" tune-up practices so that it is a thorough review of the system. They review their findings with the customer, and oftentimes perform additional work on the system as a result.

- However, tune-ups with additional repair work can result in distrust. The customer can believe that the repairperson is coming up with repairs to add to the bill that might not really be needed.

- One of the smaller contractors (and admittedly less financially successful) purposely avoids improvement recommendations beyond the basics so he does not become a "salesman." He was adamant that AC systems need nothing more than a check to make sure it's not leaking or low on Freon, that the coils and filters are kept clean, and that the temperature spread is in spec. His belief was that additional money spent on energy efficiency improvements will never pay off for the customer.

- Some contractors offer or assist with financing, or they work with customers over time – but the contractors prefer the former to the later.

One of the smaller contractors offered a service maintenance plan similar to the bigger companies, but two others described more informal plans. These are, as one contractor put it, agreements of trust. The customer is not locked in a contract, but presumably the customer will still want to call the HVAC contractor because they like the service and they can receive extra benefits (such a priority service):

- One contractor maintains monthly files that each contains a list of customers whose "agreement" first began in that month. Once a month, he calls through the current month's list to arrange service visits. Customers are never obligated – if they agree to a visit, they then get charged for it.

The annual fees for the service agreements ranged from $80 ($40 per visit) to $235 (which includes two visits plus substantial discounts on repair services).

- The contractor offering the high-end fee also had two other, lower priced options of $155 (with no discounts on other repairs) and $179 (with moderate discounts).

- Other contractors mentioned fees between $100 and $150 per year ($50 to $75 per visit).

To sell the service agreements, contractors typically offer them to new customers at the end of a service visit. They explain the benefits verbally, and customers either agree or refuse. It is a very short, simple step at the end of the service call.

The contractors reported relatively high "renewal" rates with their service maintenance agreements – ranging from "over half" to "90%." A renewal is not a formal extension of an agreement, but rather the contractor calls to set the twice yearly appointments, and some of these appointment calls result in the customer declining an appointment.

- These contractors believe that non-renewals are usually a matter of the homeowner not being able to afford it – although some non-renewals could be related to customers not believing they are getting much value from the service.

Nearly all of the contractors in the interviews believe that there are three situations that increase the likelihood of a household signing up for a service agreement:

- Older customers. Contractors suggested that older customers have had more experience with things breaking down so are more inclined to take care of their equipment. One contractor mentioned that those who sign up for service agreements are probably the same people who regularly change to oil in their car.

- Older systems. Households with older systems are more likely to sign up for an agreement. People with newer systems are more likely to believe that their system does not need on-going maintenance yet. Several of the contractors also pointed out that the current economic situation has prompted many people to try to keep their existing, older unit functioning as long as possible – which has prompted more repair calls, and presumably increased customer interest in ongoing agreements where they receive not just the inspections but discounts on repair work.

- Owners, not renters or even landlords. The contractors reported that renters do nothing to care for the AC, so typically have neglected systems with clogged filters.

    - However, some landlords recognize this problem so might require tenants to change filters regularly in their lease agreements, or they engage in a service maintenance contract. But most landlords, according to these contractors, do not want to spend money maintaining an HVAC system – landlords are trying to limit their expense and don't get much benefit from reducing energy usage.

Despite some customers believing in and wanting the benefits of regular maintenance, the contractors mentioned that they have to be proactive about contacting their service maintenance customers to schedule an appointment. Customers, left to their own initiative, would wait until August, or until their system breaks down.

HVAC QM Program Reactions

During the interview, contractors were read a description of the proposed HVAC QM program. Virtually all of the contractors expressed positive support for it. This is not too surprising, though, since there is little to no downside for the contractors.

- One of the current participants, who is a larger contractor, offered the belief that the overall level of acceptance of maintenance agreements remains substantially low compared to the number of people who regularly change the oil in their vehicles, so a program to promote HVAC maintenance makes sense.

- Another mentioned that most people don't even know that they are supposed to do routine maintenance on their HVAC system.

All of the contractors like the first step of a thorough inspection. They believe that many HVAC systems are in need of maintenance and / or repair, so this is a good way to make customers aware of what their system needs.

Five of the six contractors thought the "normalization" phase of the program made sense, or at least had nothing negative to say about it. The one dissenting contractor believes that normalizing might not be cost effective. Once the basics of cleaning and a few other relatively simple things are done, additional improvements won't do too much to help either with system longevity or with energy efficiency.

All six contractors expressed support for the on-going maintenance agreement aspect of the program, and do believe that all customers who participate in the program should have the on-going service.

- These contractors believe that HVAC system problems sometimes take time to develop or to present themselves, so 3 years seemed like the right minimum length of time that customers should engage in the maintenance agreements.

- However, they are less convinced that the maintenance agreement should be mandatory. Mandatory might scare some customers away.

- Also, not all of the contractors believe that twice annual visits are needed. Once a year visits are enough for some customers. Homes in rural, dusty locations or with shedding pets might need more frequent visits.

A strong positive of the HVAC QM program is the adherence to an industry standard. Some of the contractors are of the opinion that other contractors can have different ways of maintaining and repairing systems, or different opinions about what should be done to maintain an HVAC system. This creates confusion and distrust among customers.

- The fact that the QM program would follow a validated standard can be a selling point with customers – "we're not doing it because we think it will work. We're doing it because here are your ACCA standards."

When asked about incentive amounts, the contractors gave percentage ranges between 25% and 50%. Not too surprisingly, most supported a higher incentive. Those who have participated in HVAC programs before mentioned that 50% motivates action. For example, a $99 tune-up and inspection would cost the customer $49 – making it a good value for the customer.

- One contractor with experience with HVAC replacement incentives felt that incentives in the $1,000-$2,000 range were needed to motivate replacement of a $6,000 system.

- However, the incentives create a value proposition that still needs to be supported by other benefits: system longevity, energy savings, etc. Of note, the existing service maintenance agreements that contractors offer include important benefits that are not explicitly part of the QM program – including discounts on repairs and priority service.

When asked whether the incentives should be paid to the customer or the contractor, most of the contractors preferred that they receive the incentive. Reasons include:

- Some customers don't want to pay out of pocket and then wait for reimbursement – they don't have the money for this.

- Contractors can work with more flexibility – for example, they might offer a service for no cost if they felt the incentive was enough to make it worth their time.

- Some contractors finance repair work, and worry that a customer might get an incentive but default on their financing.

MARKETING AND PROGRAM SUPPORT

In the interviews, contractors strongly encouraged PG&E to provide marketing and related program support. While the contractors don't believe there is any downside to the program or to any support from PG&E, they did have suggestions about promotional and program support they believe could be most effective. Key aspects of support, from the contractors' perspective, include:

- Raising awareness. Contractors would like PG&E to raise general awareness about AC maintenance and energy efficiency. One contractor reported a higher conversion rate of customers to a service agreement as a result of PG&E's awareness building for another recent HVAC program.
    - Contractors mentioned things like radio ads and bill inserts.
    - Raising awareness helps address the larger problem of lack of education and knowledge – where relatively few customers know what they should be doping to maintain their HVAC system.

- Co-branding. Contractors recognize that they have a credibility problem when they market AC maintenance and tune-ups on their own (although several of the interview participants do actively market these services). Contractors believe that PG&E is more reputable and more credible than they are.
    - Contractors would like the use of: (1) PG&E literature (possibly downloaded from a PG&E website), and (2) PG&E's logo, which they could use on their own marketing materials for the program.

- A website. To provide additional credibility, contractors would like PG&E to offer a website with more details about the program, including factual information about potential energy savings for different upgrades or improvements that the contractor may recommend for a particular system. Contractors can refer customers to the website so customers get assurances that the information is not just coming from the contractor.
    - They would also like PG&E to create a list of qualified contractors on the website, so customers could verify that the contractor is "verified" by PG&E for the program.

- Targeting. One of the more knowledgeable contractors suggested that PG&E use energy consumption data to help contractors target the homes that might benefit most from the program.

- Simplified processing. Contractors said they won't participate if the effort required of themselves and their customers is more than the incentive is worth.

- Auditing contractor's work. The contractors who are current program participants suggested that PG&E needs to audit contractor work to ensure that all contractors are meeting the same standards. Apparently, they fear that less reputable contractors might cut corners and damage the reputation of the program for all of them.

Contractors also mentioned that they like the training that is typically offered through program participation. They had very positive comments about the quality of the training they have received in the past.

- One contractor (a small non-participant) expressed concern about the cost, time requirements, and location of training, which can make it difficult for smaller contractors to participate.

CONCLUSIONS

To summarize, contractors are clearly interested in an incentive program that encourages customers to engage in maintaining their HVAC systems at a more efficient level.

Targeting

Contractors believe that older customers and those with older systems are more likely to be interested in maintaining their HVAC systems, so it could make sense for the program to target these two groups.

Younger customers and those with newer units, if targeted, might require additional or different messaging to educate them about the value of maintenance. This will be a more difficult sell.

Renters are not good targets, but landlords might be since they are financially motivated to avoid large HVAC repair bills. Landlords would probably need a message focused on the benefits of avoided repair costs rather than saving energy.

Program

Contractors had few negatives about the proposed HVAC QM Program. In particular, they are very favorable about each phase: the initial inspection, "normalization," and the service maintenance agreements.

Some contractors already offer tune-ups/inspections that, in their opinion, are similar to the program's initial visit. This probably just makes it easier for these contractors to meet the standards of the program.

All 6 contractors in the interviews offer maintenance agreements but these are typically more comprehensive than just the periodic (twice yearly) cleaning and inspection visits. Contractors offer the additional benefits of discounts on repairs and priority service, plus customers can drop the service at any time. For the program, participating contractors might want to tailor their service maintenance agreements with similar benefits.

Contractors typically charge $100 to $150 annually for their service maintenance contracts, or $50-$75 per maintenance visit. Incentives in the range of 25% to 50% made the most sense to contractors – to motivate action among customers.

Marketing

Key aspects of support that PG&E should provide, from the contractors' perspective, include:

- Raising awareness. Contractors would like PG&E to raise general awareness about AC maintenance and energy efficiency.

- Co-branding. Contractors recognize that they have a credibility problem when they market AC maintenance and tune-ups on their own, so would like the use of: (1) PG&E literature (possibly downloaded from a PG&E website), and (2) PG&E's logo, which they could use on their own marketing materials for the program.

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- Targeting. One of the more knowledgeable contractors suggested that PG&E use energy consumption data to help contractors target the homes that might benefit most from the program.

- Simplified processing. Contractors said they won't participate if the effort required is too much work.

- Auditing contractor's work. The contractors who are current program participants suggested that PG&E needs to audit contractor work to ensure that all contractors are meeting the same standards. Apparently, they fear that less reputable contractors might cut corners and damage the reputation of the program for all of them.

Based on what contractors believe sells maintenance, messaging might highlight the security and peace of mind customers achieve from knowing their HVAC system is safe, efficient, and in good working order.

QUALITATIVE CUSTOMER RESEARCH

Summary findings from the 6 residential focus groups are discussed in the following sections.

SAVING ENERGY AND HVACS

Not surprisingly, most residential customers in the focus groups are concerned about reducing their energy use. By design, all of the focus group participants have high summer energy bills, so are more affluent than the average customer. The types of actions they have taken to reduce their energy use reflect this, but nonetheless, these customers are all trying to do what they can to save energy to reduce their PG&E bills.

Customers reported making some effort through changes in behaviors, such as raising their thermostat in the summer and lowering it in the winter, trying to convince their children to turn things off when not in use, and cutting back on their pool pump's run times.

However, a substantial component of their efforts to reduce energy use was through home improvements – frequently during remodels. Some of the more common actions mentioned in the groups include:

- Replaced old windows with energy efficient ones
- Replaced old appliances with energy star appliances
- Installed programmable thermostats
- Added insulation
- Replaced incandescent light bulbs with compact fluorescent light bulbs
- Installed power strips for shutting off electronics
- Installed whole house fans
- Replaced old pool pumps

Some customers in the groups also replaced an old HVAC system with a new, more efficient model.

While saving energy has been a motivating goal, many of these households have also wanted to increase comfort and, to a lesser extent, safety. For example:

- One customer replaced very large single pane windows with new windows primarily for safety – she feared that her children might crash through or that the windows would shatter in the earthquake.

- Another customer replaced an old HVAC system that leaked hazardous gas into his home.

- As part of an HVAC replacement, one customer had ducting replaced as well to correct some problems with uneven heating and cooling in the home.

- Several customers in the more temperate climate areas added central AC to an older home simply to increase their comfort.

Despite their widespread efforts to reduce their energy usage, most customers reported that they did not see much difference in their PG&E bills for their efforts and expense. While these customers expressed their frustration that the improvements they made to their homes did not save them any money, they did not spend too much time in the focus groups complaining about this. Rather, they seemed to accept their high energy bills as a part of their lifestyles or they placed part of the blame on the design and location of their home (e.g., on a hill that receives direct sun throughout the day, cathedral ceilings, etc.)

- Some customers pointed out that their energy savings were offset by rate increases.

- Customers did reap other benefits, such as improved comfort (especially those who replaced their HVAC system).

- A few customers did believe that some of their improvements lowered their bills, but they were a minority in the groups.

Some customers mentioned being unhappy with their SmartMeters during the initial discussions about their efforts to conserve energy. They shared stories about their bill increasing after their SmartMeter was installed.

- Only one customer in one of the groups was aware that you can go online to view energy usage data. When the rest of the customers in the group were told that they could use this feature to help determine their energy savings from HVAC improvements and maintenance, they responded favorably.

Implications: Some customers will doubt unsubstantiated claims about energy efficiency benefits of the HVAC QM program – and may even doubt claims that are substantiated. Others could be motivated more by comfort and safety than by energy efficiency due to their own lifestyle or specific HVAC system's circumstances as well.

It might also make sense to incorporate the use of SmartMeter data in the HVAC QM program, or to at least promote online energy management tools to customers who are considering the HVAC QM program.

HVAC Knowledge and Maintenance Practices

Most of the customers in the focus groups are quite knowledgeable about the age and general condition of their HVAC systems. While quite a few in the groups had systems more than 15 years old, all but a few believe that their system works reasonably well.

- A few had complaints about the comfort of their homes such as rooms being too hot or too cold, but by and large these customers seemed reasonably satisfied, or at least complacent, with their existing systems.

- However, very few knew anything about the efficiency of their HVAC unit. They know that their HVAC contributes to their energy bill, but they have little understanding about efficiency, other than believing that older units might not be as efficient, and a few customers who knew about SEER ratings.

- Very few of these customers seemed to think that air conditioning was the singular major cause of their higher bills. They mentioned other contributors, such as clothes washing and drying, swimming pool pumps, multiple computers and other electronics, etc.

Nearly everyone said they change their filters at least on occasion. A few customers said they change them every month, and a few others at the other end of the spectrum changed them less than once a year, but most were in the range of changing filters every couple of months to at least once a year. They believe there are two benefits:

- Their HVAC system doesn't have to work as hard with a clean filter so they presume it will use less energy and might even last longer.

- Their home remains cleaner with less dust. In fact, quite a few mentioned cleanliness and health benefits (e.g., asthma-related) as the main reason they changed their filters rather than energy savings.

Some customers reported hearing the air whistling around the vents as an indicator that they needed to change their filters, while others keep track of the time between change outs.

About half the customers in the focus groups said they washed the outside condenser coil at least on occasion by hosing and/or wiping it off. Some did this frequently – several times a season, while others cleaned it no more than once a year. Those who cleaned the outside unit believe that it helps the system work more efficiently because it assists heat transfer. A few said they cleaned it just because they like things to be clean rather than for any functional or energy-related purpose.

A few of the more mechanically talented (including a roofing contractor, a maintenance worker, and a sheet metal worker) actually do basic repairs on their AC in addition to routine maintenance, but even these people leave more major repairs to HVAC contractors.

A few customers in the groups mentioned having a contractor fix their duct work. Over time the ductwork of their older systems developed holes, so when this was discovered they had it repaired. These customers said they saw an improvement in their AC function as a result – it worked better.

Those who do not maintain their HVAC either don't know that they should, or they actively oppose maintenance as being too costly in the long run. Both of these situations reflect a lack of knowledge about the long-term benefits of HVAC maintenance.

In sum, customers can be divided into three subgroups: (1) those who believe in maintaining their AC system and who make decisions to this end (e.g., they enroll in on-going maintenance agreements, they clean their system and replace filters frequently, etc.), (2) those who do not (e.g., they sometimes change a filter but nothing else, they consciously believe that an AC system will last longer without repairs if no one touches it other than to change filters and an occasional cleaning), and (3) those who don't really know since they haven't really thought about it.

Implications: Most customers know about the basics of HVAC maintenance but not much more. They are not too diligent about routine maintenance as well, since very

few change filters monthly. They are open to learning more, and to doing a better job with their HVAC maintenance, but this will require considerable education.

EXISTING SERVICE MAINTENANCE AGREEMENTS

A minority of customers in the focus groups have a service maintenance agreement. These customers receive twice yearly, or sometimes annual, visits where their AC technician inspects, cleans, and performs preventative maintenance.

Customers who have maintenance agreements got started for one of two reasons:

- They recently replaced an old unit or purchased a new unit, so wanted to protect their investment.
    - However, other customers who had recently purchased a new unit said they did not think maintenance agreement was needed because their unit was so new. They felt that after it was 5 or 6 years old, they would think about having it inspected.

- They had service done on an older unit, so wanted to avoid future problems with their AC system. Since contractors typically offer the additional benefits of priority service and discounts on repairs, a service maintenance agreement for these customers is somewhat like an insurance policy.

Virtually all the customers with service maintenance contracts expressed their satisfaction with their contractor, and with the maintenance service. None really knew if the service was financially beneficial, but they likened it to changing the oil on your car. It probably extends the life of the unit and avoids untimely breakdowns.

- Some of the women in the groups said they worried that HVAC contractors might take advantage of them. One customer said that he had to work through a few different HVAC technicians to find the one that his wife likes. The technician who won his wife's trust takes time to explain things in some detail.

A few of the customers without service maintenance agreements did not know that their HVAC system needed any maintenance, but most without the maintenance agreements said they did not think they would pay off.

- Some customers are skeptical that periodic inspections would improve the efficiency of their systems.

- Others said that the cost was not worth it. Over time, the cost of annual maintenance would be equal to the cost of a major HVAC repair. These customers tended to believe that if their HVAC "ain't broke don't fix it."

A few residential customers in the focus groups had home warranties that cover their HVAC system, where they pay an annual fee ($500-$600) plus a service visit fee of $50-$60. These customers said that their warranty company does not do any maintenance but does fix the system whenever it stops working.

- While these customers did say that maintenance might make sense, it is contrary to the "fix it when it breaks" approach of the home warranty. As long

as they have the home warranty, they would not sign up for HVAC service maintenance.

Implications: Maintenance service agreements have caught on with some people, and the existing fees seem reasonable to them. These customers are already accomplishing most of the benefits of the proposed HVAC QM program: they've had their system "tuned up" and they keep it clean. They also tend to have preventative repairs completed when recommended by their contractor. These customers are clearly onboard with the intent and benefits of the HVAC QM program, and might even become "free riders" since they already pay market rates for AC maintenance.

For most residential, though, a case needs to be made about the value of a service agreement for annual or twice yearly visits – which could include not only potential energy savings, but also the value of priority service and repair discounts. However, these customers might be difficult to convince unless the design of the program and/or marketing can overcome their distrust.

Customers with home warranties are not likely to be good prospects for the HVAC QM program, but they are a relatively small percentage of the population.

PERCEPTIONS ABOUT HVAC CONTRACTORS

Most customers learned what they know about HVAC maintenance from an HVAC contractor – either someone they called for a repair visit or a family member or friend who is an HVAC contractor. Contractors who take the time to explain what an HVAC system needs regarding homeowner maintenance (replacing filters) and professional maintenance (annual or twice yearly inspections, the importance of cleaning, the most common problems that can be identified early to avoid breakdown, etc.) seem to have a big impact on customers' subsequent actions and beliefs about their HVAC.

- One customer expressed a desire to get instructions about HVAC maintenance when you buy a home.

Customers are generally distrusting of HVAC contractors prior to working with them. They worry that an inspection of their HVAC will lead to expensive repairs that may or may not be needed. In the focus groups, a few of the homeowners shared their experiences where they believe they were misled by a contractor. This leads many residential homeowners to adopt a "head in the sand" attitude toward HVAC maintenance – they are afraid to have someone even look at their HVAC system.

- However, once they do call an HVAC contractor when their system breaks down, customers tend to develop more trust, especially if the HVAC technician communicates with the customer. "Show-and-tell" clearly pays off in the customer feeling more confident about repairs and maintenance.

- Customers also described some additional characteristics of HVAC contractors that create trust: the technicians take care of the customer's home when they are there, they wear booties, and they clean up when they are done.

Customers had some common but some differing opinions about how to find a trustworthy HVAC contractor.

- Nearly everyone said they asked neighbors or friends for referrals – a few good words about a contractor from someone they know go a long way.

- Customers without a referral, though, were split between wanting a large, "big yellow pages ad" contractor and a "small ad" contractor. Those who wanted a larger contractor said the contractor is more likely to be there in the future, and to have experience and training on their system. Customers who wanted a smaller contractor believe that the technician is more likely to be the owner with many years of experience rather than a young employee, or worse, a subcontractor.

- Regardless of the size of the contractor, customers in the focus groups were adamant that the contractor they choose to work with needs to be licensed and have experience. Some also believe that the contractor needs specific training in "newer technologies."

Implications: Customers distrust contractors they don't know but trust the ones they do know. The program can leverage existing relationships, but not all contractors will be willing and able to become qualified for the program. If customers with an existing contractor relationship would be willing to have a qualified inspector who is not their HVAC contractor perform the initial visit, PG&E might consider allowing any contractor to perform the on-going maintenance agreements to allow customers to continue their existing service with a contractor who might otherwise not qualify for the program.

For customers without an existing contractor relationship, the program should facilitate the establishment of new relationships. Allowing contractor co-branding with PG&E, publishing an approved list of qualified contractors, and providing oversight in the field (such as offering "second opinions" or review of completed work) will help alleviate customer trust issues. Contractor training might focus on communication skills as well.

RESPONSE TO THE HVAC QUALITY MAINTENANCE (QM) PROGRAM

During the focus groups, customers read and heard a description of PG&E's HVAC Quality Maintenance (QM) program (see the appendix for the verbatim description). The QM program was further described as including three stages: (1) an inspection visit, (2) repairs and improvements ("normalization" to bring the HVAC system up to ACCA standard 4), and (3) on-going service maintenance.

Residential customers were generally favorable about the program, but had several concerns that would need to be addressed before they would participate.

The first stage of the program is appealing to nearly everyone with an HVAC that is more than about 5 years old. Since knowledge about their HVAC systems is limited, homeowners really like the prospect of having a thorough, unbiased inspection with recommendations for improvement. Currently, homeowners can have their HVAC inspected, but those without an existing relationship with a contractor don't trust someone they would call in for this. Much of the appeal of the QM program inspections is based on trust.

- Customers believe that the inspection could be trusted because it is backed by PG&E, in part because the inspector would be qualified by PG&E.

- Secondarily, customers are favorable about the inspection being based to an industry standard.

- Further, customers suggested that the inspection be completed by someone without a vested interest in potential repair work. At a minimum, customers want the option to get bids for the identified improvements from contractors other than the inspector.
    - Customers likened this to test-only smog check stations.
    - Some customers went further to say that the inspector should be a PG&E employee. This would be similar to inspections completed by water districts.

- A few customers in the groups mentioned they wanted someone to look at their whole house. These customers recognize that their HVAC efficiency might be hampered by their home itself, and have concerns that an HVAC-only program might not be enough to make an impact.

The second stage of the QM program is "normalization." For customers to spend the money on improvements, they want:

- The opportunity to get bids from different HVAC contractors. This just seems prudent and would assuage their fears that the inspection might include recommendations that are not really needed.
    - Customers in one of the focus groups suggested that the program offer an optional follow up inspection upon request of the homeowner (either after the initial inspection or after the "normalization" work is completed) for instances where the homeowner has doubts about the work that was done.

- Assurances that the improvements will reduce their energy consumption and that this will translate into savings on their electricity bills. Probably because prior experiences with energy efficiency improvements have not led to noticeable drops in their bills, customers would like fact-based information about how much energy they might be able to save. This would allow them to compare costs of improvements against the expected energy savings so they could determine an ROI. Without substantiating claims about saving energy, the HVAC QM program is likely to lose customers at this stage.

- Additional information to help them decide on "repair or replace." Customers with older units expressed concern that the program might recommend expensive improvements whereas a more effective solution might be to replace the entire system.

The third stage of the program is an on-going maintenance agreement. Customers expressed mixed opinions about the necessity of on-going maintenance. Some felt that once they had an inspection and completed upgrades, their HVAC system should work like new for quite a few years before requiring another inspection. Others were more accepting of the premise that on-going inspections are needed to ensure that the system remains at its peak condition, especially those who already have maintenance service agreements. In either case, customers recommended:

- Service maintenance agreements should be optional. Requiring maintenance agreements would likely be a barrier to some customers from agreeing to an

initial inspection. Also, most customers felt that the benefits of each stage of the program should sell themselves. If PG&E can demonstrate the value of on-going maintenance, they customers said they would sign up for it.

- Allow customers to decide between annual or twice yearly maintenance visits. Again, some customers are skeptical that their HVAC would benefit from the more frequent visits, while others think that twice yearly is justified.

- Allow customers to choose the contractor, and to "hire and fire." Customers are somewhat fearful of being stuck with a contractor that they don't like, so want the flexibility to hire and fire contractors.

Despite their preference for optional service maintenance agreements, most customers did not think it was unreasonable to require maintenance agreements for as long as three years if the incentives are sufficient to offset some of the cost.

- Because their knowledge about HVAC systems is very limited, customers became more accepting of program conditions when they learned more about the benefits.

A concern among virtually all customers with an existing relationship with an HVAC contractor is the ability to use their existing contractor to do the program work. These customers already have a trusted contractor, so do not need the assurances that other customers would value from the program.

- This means that some customers will want the initial inspection, the normalization, and the service maintenance visits to be completed by one contractor. The program could be designed to allow for this, as well as the alternative where the initial inspection is completed by a "test only" contractor.

- Since not all contractors will become qualified by program standards, the program might also allow for "unqualified" contractors to perform the on-going service maintenance visits once the initial inspection visit and "normalization" improvements have been completed.

Customers without a trusted HVAC contractor did raise a concern about less skilled or subcontracted technicians actually doing the work. Customers do want to know that the actual technician who would come to their home meets the stringent standards of the program.

- Assuming that all technicians making field visits will have received the training and been qualified by PG&E, this could be addressed in program communications.

Implications: (1) Initial inspection visit: Customers found this stage very appealing, but much of the appeal of the HVAC QM program is based on the implicit trust customers have about PG&E backing the program and ensuring quality standards, so trust-building component should be center-stage of program design and marketing. Customers also want the option for an inspector without a vested interest in the results – essentially an "inspect only" inspector.

A few customers might be better served by a "whole house" approach, so the HVAC QM program might need to inform both contractors and customers about the "whole house" program as an alternative.

(2) "Normalization" repairs and improvements: Customers have concerns about this stage, again related to trust. They suggested: allow customers to get bids from multiple contractors, provide assurances that the improvements will translate into reduce energy use, and help customers with old units make a "repair or replace" decision.

(3) On-going service maintenance: Customers are also skeptical about the value of the service agreements, so: allow service agreements to be optional, allow customers to choose between annual and twice yearly service visits, and allow customers to "hire and fire" their service maintenance contractor. These concerns could be mitigated by education as well.

Customers with an existing HVAC contractor relationship could want their contractor to inspect, normalize, and service – so the program could be designed to allow for this (as well as the alternative situation where customers want the inspector to be "inspect only.")

INCENTIVES

The program description specifies that the contractor receives the incentives for the "normalization" component, while either the contractor or the customer receives the incentive for service maintenance agreements. Customers' initial reactions to this were very negative – they did not trust that contractors would pass on all the benefits of the incentives.

- However, once it was explained that customers would receive confirmation about the incentive amounts that the contractor would receive, and that they might prefer not to fill out a rebate form and wait for their rebate, most customers said they would not have a problem with the incentives going directly to the contractor.

- A minority still said they would prefer to get the incentives themselves.

Customers had a difficult time estimating what they thought would be reasonable incentive amounts.

- Initial Inspection. Most felt that an initial inspection cost of $100-$150 would be reasonable and would pay this amount, but that a rebate of 50% would provide the additional motivation to get them to take action. A rebate amount as low as 25% seemed acceptable as well, but perhaps not enough for them to take action.

- "Normalization." Regarding the repairs and improvements needed for "normalization," customers felt that a rebate around 25% - 30% would seem reasonable, but they pointed out that the costs for "normalization" would need to be justified by lower energy bills. Thus, the incentive amount here is somewhat contingent on the energy savings stemming from the recommended improvements.

- Maintenance Service Visits. Customers likewise had difficulty identifying an incentive amount for the maintenance service visits. Customers with existing service agreements said they paid between $40 and $75 per visit, and these amounts seemed reasonable to most of the customers who were interested in the program. Similar to their opinions regarding the initial visit, they felt that an incentive amount of 25% to 50% would be reasonable, with the higher amount being more likely to motivate their action.
    - However, customers seemed willing to sign up for the initial visit without any expectations about the results, but the maintenance service visits, similar to improvements and repairs, should be justified by energy savings as a result of these visits.

It should be noted, though, that most contractors offer additional benefits with their service maintenance agreements – these other benefits could help sell the program since they increase the value proposition for the customer. In addition to the visits for inspection and cleaning, contractors provide their service agreement customers with:

- Priority service. This is a very meaningful benefit since most HVAC breakdowns occur in the heat of summer or the cold of winter.

- Discounts on repairs. Some contractors also offer discounts on repairs to customers that are on their service agreement list. It might make sense for customers to actually sign up for a maintenance agreement before completing the "normalization" repairs if this qualified them for an additional discount from the contractor on top of the rebated repair work.
    - Contractors might also want to offer a service agreement with the added discounts at the time of the initial inspection as an incentive to the customer to use them for the repair work.

Implications: The program might need to ensure that contractors explain the incentives that are paid directly to the contractors. Incentive amounts suggested by customers ranged from 25% to 50%. The program might also need to take into consideration that service agreements currently offered by contractors provide the additional benefits of priority service and repair discounts, which are quite valuable to some customers.

PROMOTING THE PROGRAM

Residential customers expressed a preference for PG&E to promote the program rather than for contractors to do so. Customers' reasons for this are:

- PG&E is a more trusted source of information.

- They are less likely to miss out if PG&E promotes it.

- Contractor promotions will be more sales-oriented, which is a turn off.

Customers offered up the usual types of communication channels that PG&E has used in the past: bill inserts, direct mail, TV and radio advertising, and the website. Some also suggested email.

Most customers also felt that contractor promotions would make sense since to ensure that more people heard about the program. This was especially true of those with an existing relationship with an HVAC contractor. These customers felt it would make sense for their HVAC technician to let them know about the QM program in the normal course of business (such as when the contractor calls the customer to schedule an appointment).

- Partnering between PG&E and contractors would probably be a win-win for both. Customers are distrustful of contractors they've not worked with, while at the same time some customers are reluctant to give up any control of their energy use to PG&E. PG&E would help contractors make the initial contact with customers, and then customers would interface with the contractor thereby not involving PG&E in any "control" issues.

Implications: PG&E should consider a variety of promotional channels – both direct to customers and through partnership with contractors.

CONCLUSIONS

Conclusions from the residential customer focus groups are summarized next.

Customers and Targeting

Customers can be divided into three subgroups: (1) those who believe in maintaining their HVAC system and who make decisions to this end (e.g., they enroll in on-going maintenance agreements, they clean their system and replace filters frequently, etc.), (2) those who do not (e.g., they sometimes change a filter but nothing else, they consciously believe that an HVAC system will last longer without repairs if no one touches it other than to change filters and an occasional cleaning), and (3) those who don't really know since they haven't really thought about it.

- Customers with existing HVAC service contracts. Those who believe in maintenance think they are already accomplishing most of the benefits of the proposed HVAC QM program: they've had their system "tuned-up" and they keep it clean. They also tend to have preventative repairs completed when recommended by their AC service person/contractor. These customers are clearly onboard with the intent and benefits of the HVAC QM program, and might become "free riders" since they already pay market rates for AC maintenance.

- Customers who don't believe in AC service. Customers who are against regular AC maintenance are distrusting of contractors – in some cases based on a negative experience where they believe they were taken advantage of by a contractor. These customers might be difficult to convince unless the design of the program and/or marketing can overcome their distrust. The good news is that much of the program does just this.

- Customers who "don't know." These customers represent a blank slate in need of considerable education about the benefits of maintain their HVAC systems.

Marketing and Messaging

Customers in the focus groups shared the opinion that the things they have done to reduce their energy use have not had any noticeable impact on their PG&E bills, including those who had replaced their HVAC systems with new, more energy efficient models. As a result, a message of energy savings might not be too compelling by itself. Additional benefits to consider in promotions include: extending the life of their HVAC system, increasing comfort by correcting problems, and ensuring cleaner air and the health benefits that can derive from this.

- PG&E as the message source. Customers who currently do not have a trusted relationship with an HVAC contractor liked the idea that PG&E would promote the program to its customer base through mail, bill inserts, email, and other methods.

- Contractors as the message source. Customers who have a current relationship with an HVAC contractor would like to hear about the program from their contractor. They couldn't imagine working with someone else for HVAC work, so believe that the program only makes sense if their "AC guy" is the one who would tell them about it and then perform the work.

Program Design and Development

Customers generally liked the idea of the program – even those who were skeptical about the need for maintenance. However, since those who are skeptical distrust contractors, the program will need to bolster confidence. This might be accomplished if (1) the initial visit is completed by an "independent" inspector who has nothing to gain from the findings, and (2) customers can choose to have a "second opinion" regarding any improvements that are needed. Additionally:

- Cost Effectiveness. Customers were concerned that the program might cost them more than they could save by reducing their energy consumption. To help them decide on participation, customers want to know how much energy the "normalization" improvements could save, and then how much the on-going service maintenance visits could save.

- Contractor Qualifications. Customers in the groups were adamant that the inspector/contractor needs to be licensed and have experience. Some also believe that the contractor needs specific training in the "newer technologies" that have come along, although they did not have much interest in hearing that these contractors would need to be "qualified" by the program, probably because they don't really know how this would make the person better at their job. At a minimum, qualification by the program would need some explanation for customers to understand the benefit.

- Incentive amounts. Customers had difficulty coming up with dollar amounts they would be willing to pay for the stages of HVAC QM, but did think that incentives in the range of 25% to 50% would make sense. The going rate of $50-$75 per maintenance visit seemed to make sense to those not currently with a service contract, yet it's not likely that they would begin a service contract without a financial "push" of a meaningful incentive.

- Additional service agreement benefits. Contractors offer their service agreement customers (1) head of the line service, which can be valuable during the hot summer months when AC systems tend to fail, and (2) discounts on additional work. Another benefit is simply having an existing relationship that the homeowner can call when their system needs repair, since this typically happens in the heat of summer when the repair is much more urgent. These benefits should be considered for the HVAC QM program design.

- Repair or Replace. Some customers with older units were concerned that the HVAC QM program might encourage them to do the equivalent of "putting a $5,000 engine into a Yugo." The program could include a replacement option.

- "Whole House" Connection. Several customers in the groups mentioned they wanted someone to look at their whole house. These customers recognize that their AC efficiency might be hampered by their home itself. The HVAC QM program just might not be enough for some customers, so there could be a plan to steer these customers to the whole house program.

- SmartMeter Connection. Some customers mentioned being unhappy with their SmartMeters, probably because they do not understand the benefits. It might make sense to incorporate the use of SmartMeter data in the HVAC QM program, or to at least promote online energy management tools to customers who are considering the HVAC QM program.

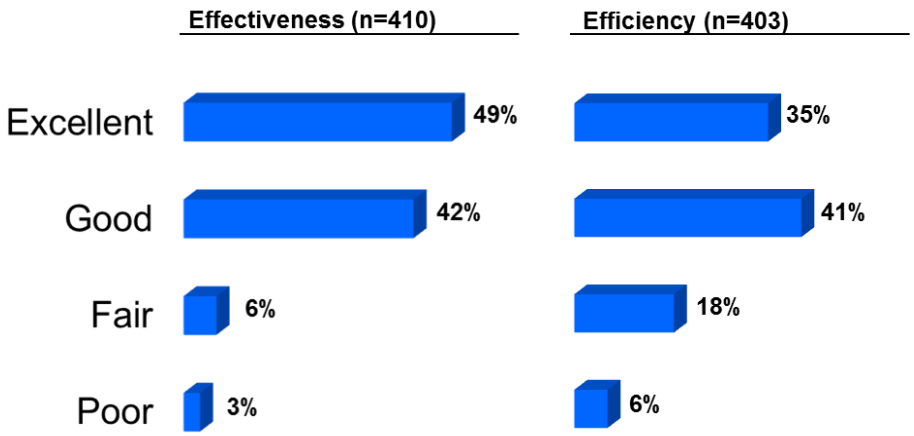
QUANTITATIVE CUSTOMER RESEARCH

Following completion of the focus groups, the quantitative survey was conducted. Results from the survey are discussed next.

AC CONDITION AND USAGE

Most residential customers have high opinions of their central AC's effectiveness– half (49%) rate it "excellent" on overall effectiveness in cooling and another 42% rate it "good." But, fewer (35% and 41%, respectively) rate it "excellent" or "good" for overall efficiency. This suggests some opportunity, especially regarding efficiency.

TABLE 1. CUSTOMER REPORTED AC EFFECTIVENESS AND EFFICIENCY



The estimated ages of their central AC systems are shown here. About half (51%) are less than 10 years old. Almost one in three (30%) are 15 years old or older.

- Age of the AC is strongly related to customer perceptions about the efficiency of their central AC system.

TABLE 2. AGE AND PERCEIVED EFFICIENCY OF AC

Age (in years)	% of Total (n=410)	AC Efficiency: Excellent (n=142) a	Good (n=164) b	Fair/Poor (n=97) c
0 to 4 years	22%	40% bc	21% c	1%
5 to 9 years	29%	33% c	30% c	16%
10 to 14 years	19%	16%	18%	23%
15 or more years	30%	11%	30% a	60% ab

Desired improvements also reflect a strong interest in increasing their central AC system's energy efficiency. Among the 66% of respondents who were "very" and "somewhat" interested in improving their central AC, four out of five (81%) mentioned wanting to improve their AC's energy efficiency, while another 51% mentioned wanting to improve comfort and 46% said the longevity of their AC system.

- Those who rate their AC's efficiency as less than "excellent" are more likely to want to improve its efficiency, but also comfort and reliability.

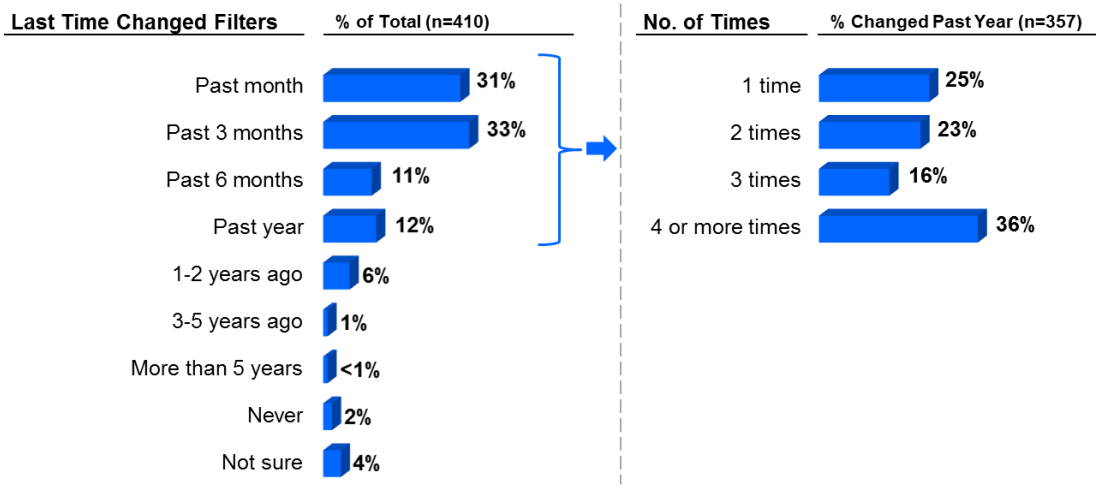
TABLE 3. DESIRED AC IMPROVEMENTS

Desired Improvements	% Interested in Improving AC (n=287)	AC Efficiency: Excellent (n=66) a	Good (n=127) b	Fair/Poor (n=90) c
Energy Efficiency	81%	55%	86% a	94% ab
Comfort (e.g. improving cooling)	51%	27%	51% a	72% ab
Longevity (e.g. system lasts longer)	46%	45%	46%	46%
Indoor Air Quality	35%	33%	33%	40%
Noise level while running	26%	23%	25%	30%
Reliability during hot weather	23%	8%	22%	37% ab
Other	6%	11% bc	3%	3%
Nothing	2%	9% bc	-	-
Not sure	1%	3%	1%	-

Nearly all homeowners say they change their AC filters. 87% said they have done so within the past year, with the vast majority (64% of respondents) saying they did so in just the past 3 months. Survey timing probably accounts for some of this since people tend to replace filters in the spring.

- This is consistent with the qualitative findings – most focus group participants said they change their filters at least annually.

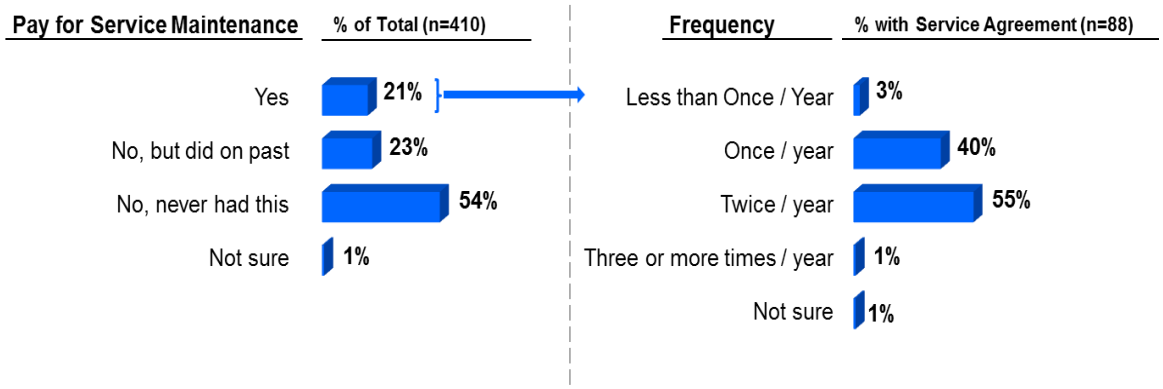
TABLE 4. RECENCY AND FREQUENCY OF CHANGING AC FILTERS



About one in five of these homeowners (21%) said they are currently paying for an AC service agreement, and another 23% said they do not currently do this but have in the past. Combined, nearly half of all homeowners with central AC have, at some point, signed up for a service agreement.

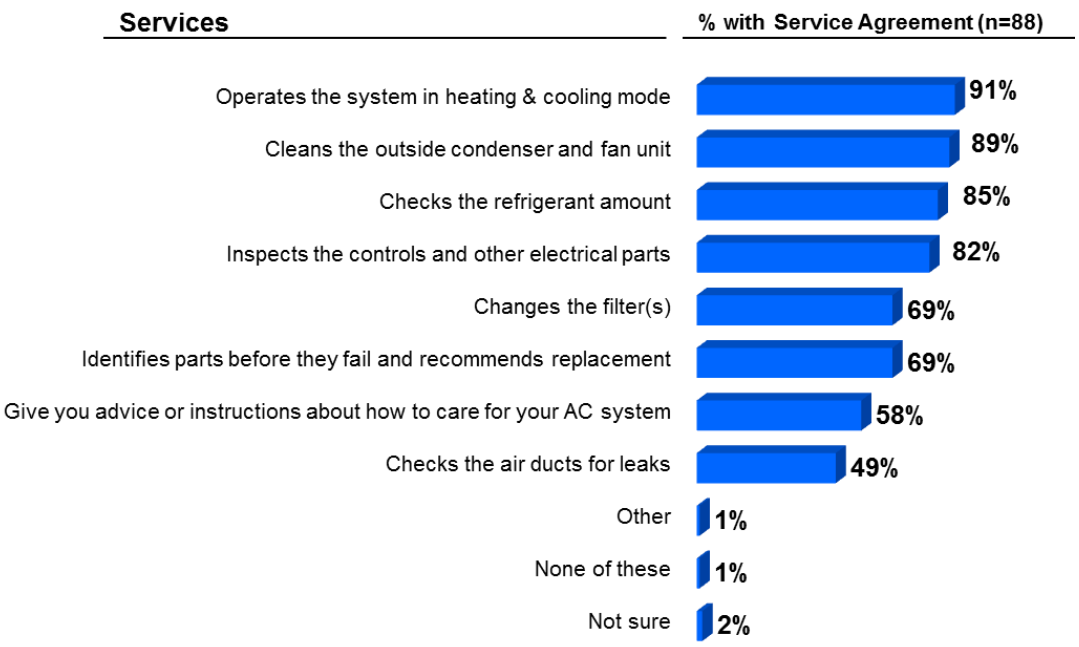
- Over half of those with a current service maintenance agreement (55%) get twice yearly visits, but nearly as many (40%) have their system serviced once a year.

TABLE 5. CUSTOMERS WITH SERVICE MAINTENANCE AGREEMENTS



Respondents are relatively knowledgeable about the services that their AC contractor performs during the service visits – the top 6 items, according to customers, are completed by at least two-thirds of the AC contractors performing service maintenance.

TABLE 6. SERVICES PERFORMED AS PART OF SERVICE MAINTENANCE AGREEMENTS



The average (mean) amount that homeowners pay annually for a service agreement is $155, but a slight majority pays less than $150. Factoring in the number of visits, customers pay about $100 per visit. Two-thirds (66%) say it is "definitely worth it."

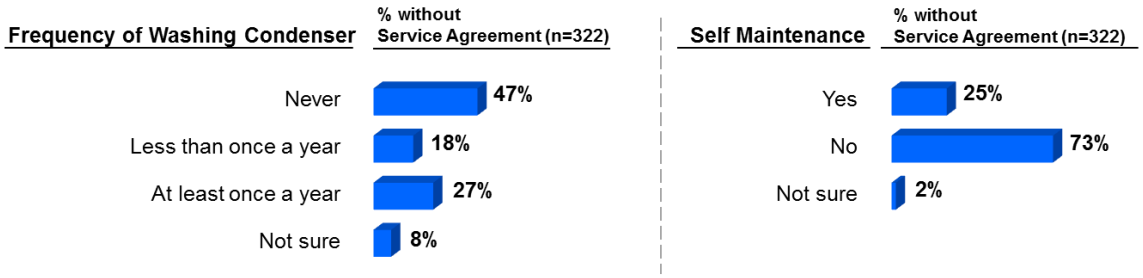
- Those who pay less are more likely to say it is "definitely worth it," yet those who do not think it is worth it are paying, on average, about the same as those who say it is "definitely worth it." Apparently, a lack of perceived value is not just about price. It might be influenced by customer's beliefs about what they receive as part of their service agreement.

TABLE 7. AMOUNT PAID ANNUALLY FOR SERVICE MAINTENANCE AGREEMENT

Amount Paid Annually	% with Service Agreement (n=88)	Value: Definitely Worth It 66% (n=58)	Value: Probably Worth It 26% (n=23)	Value: Probably Not Worth It 5% (n=4)	Value: Definitely Not Worth It 2% (n=2)
$0 - $49	1%	2%	-	-	-
$50 - $99	28%	33%	22%	-	-
$100 - $149	34%	31%	35%	75%	-
$150 - $199	15%	14%	17%	-	50%
$200 or more	20%	19%	26%	25%	50%
Mean	$155	$139	$203	$139	$143

Among those without a service maintenance agreement, about half (45%) periodically wash down the outside condenser unit, and one in four (25%) say they sometimes do their own maintenance (or have a friend do it). This leaves a large proportion without service maintenance agreements that perform little or no maintenance on their AC systems.

TABLE 8. SELF MAINTENANCE AND FREQUENCY OF WASHING THE CONDENSER



Those without a service agreement were also asked if they had ever paid for a tune-up. About half (52%) said they had done so. Most of those who have paid for a tune-up have previously had a service maintenance agreement.

- When combined with those who currently have a service agreement, 62% of residential homeowners who have central AC either currently have a service maintenance agreement, previously had a service agreement, or they have paid for a tune-up. The remaining 38% have not paid for maintenance – only perhaps repairs.

TABLE 9. FREQUENCY OF PAID TUNE-UPS (IF NO SERVICE AGREEMENT)

Frequency of Paid Tune-Ups	% without Service Agreement (n=322)	Service Agreement: Current (na) [a]	Past (n=96) [b]	Never (n=226) [c]
At Least Once (NET)	**52%**	**na**	**84% c**	**38%**
Three or more times	14%	na	30% c	8%
Twice	13%	na	23% c	9%
Once	24%	na	31% c	21%
Never	43%	na	11%	56% b
Not sure	6%	na	4%	7%

Tune-ups on average are $125 – less than the annual service maintenance visits, but a bit more than the $100 per visit for service agreements. Customers perceive a bit less value from tune-ups than from service agreements – with just 30% saying it was definitely worth it for the tune-up compared to 66% among those with a service agreement.

- Also, there is a direct linear relationship between cost and perceptions of value – the more they paid, the less likely it was considered "worth it."

- Differentiating the program's initial visit from a "tune-up" will be critical.

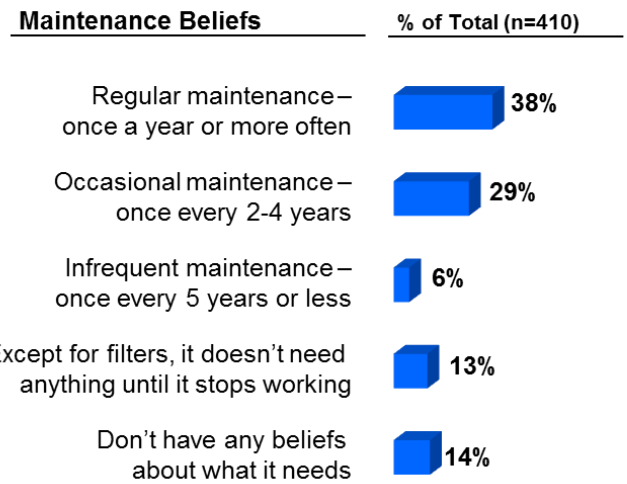
TABLE 20. AMOUNT CUSTOMERS PAID FOR TUNE-UP (WITHOUT SERVICE AGREEMENT)

Amount Paid For Tune-Up	% without Service Agreement Who Paid For Tune-Up (n=166)	Value: Definitely Worth It 30% (n=50)	Value: Probably Worth It 55% (n=91)	Value: Probably Not Worth It 8% (n=13)	Value: Definitely Not Worth It 1% (n=2)
$0 - $49	9%	22%	2%	-	-
$50 - $99	35%	28%	36%	54%	50%
$100 - $149	22%	18%	26%	26%	-
$150 - $199	10%	16%	10%	-	-
$200 or more	23%	16%	24%	23%	50%
Mean	$125	$116	$126	$139	$215

In sum, a bit more than one-third (38%) believe that regular maintenance (at least annually) is needed. Another 29% believe that maintenance every 2-4 years is needed. Relatively few (about one in five) think that maintenance is either not needed or is only needed every 5 years or less. Another 14% don't have any beliefs about maintenance.

- That a large proportion (about 67%) are presumably already open to the idea of regular or occasional maintenance is a positive for the HVAC QM program, however, those who believe in just occasional maintenance might need to be persuaded regarding the service maintenance component.

TABLE 31. CUSTOMER BELIEFS ABOUT AC MAINTENANCE



About one in four (26%) customers has needed repairs on their current AC system. The average spent is $385.

- Customer interest in HVAC QM is not contingent on their previous need for repairs, but it is influenced by the size of the repair bill. Those who spent more than $400 on previous repairs are more interested in the new program – perhaps for reliability and system longevity benefits.

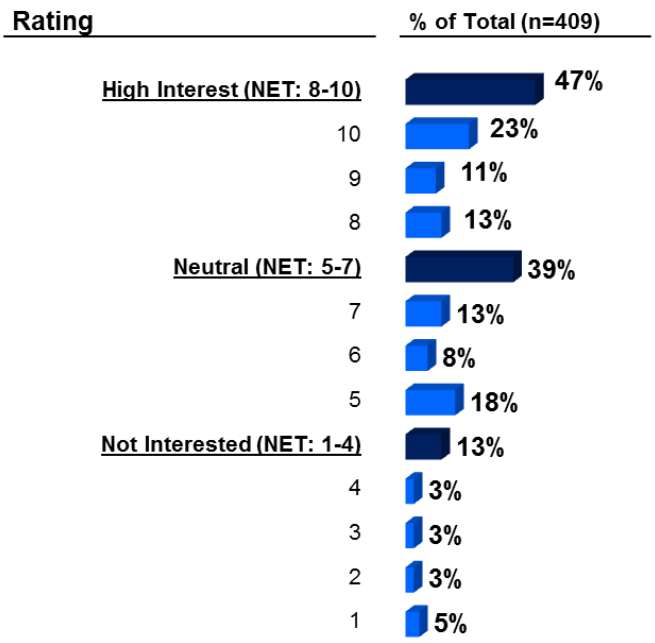
TABLE 42. FREQUENCY AND COST OF AC REPAIRS

Has Current AC System Needed Repairs	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
Yes	26%	28%	24%	24%
No	71%	68%	75%	71%
Not Sure	3%	4%	1%	5%
Amount Paid For Repairs	**% Needed Repairs (n=106)**	**(n=55)**	**(n=38)**	**(n=13)**
Less than $200	32%	31%	26%	54% b
$200 to less than $399	29%	27%	32%	31%
$400 to less than $599	25%	27%	24%	15%
$600 to less than $799	5%	4%	8%	-
$800 or more	9%	11%	11% c	-
Mean	$385	$448 c	$363 c	$186

CUSTOMER RESPONSE TO THE HVAC QUALITY MAINTENANCE (QM) PROGRAM

Nearly half (47%) of homeowners with AC have high interest (8-10 rating) in the HVAC QM program. Conversely, just 13% are not interested (1-4 rating) – a strong result for the new program.

TABLE 53. CUSTOMER INTEREST IN HVAC QM



Top-of-mind comments about what customers like best about HVAC QM are shown below. The financial aspects (incentives for efficiency) top the list. Among program details, customers like that contractors are approved by PG&E. Some customers also recognized that the program is good for those who don't know much about AC maintenance.

TABLE 64. TOP OF MIND COMMENTS ABOUT HVAC QM: POSITIVES

Positive Comments	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
NET: Incentives/Rebates/Money	**63%**	**77% bc**	**53% c**	**40%**
Incentive for efficiency	27%	31% b	23%	22%
PG&E offsets costs	21%	28% bc	15%	13%
Rebate	18%	22% c	18% c	7%
Low cost for AC services	4%	7% bc	1%	2%
Saves money	4%	6% bc	2% c	-
NET: Program Details	**29%**	**34% c**	**28% c**	**16%**
Contractors approved by PG&E	16%	22% bc	12% c	4%
Good for those who don't know about AC	7%	7%	7%	9%
Good routine for each step	5%	4%	8%	5%
Home improvement	2%	3% c	3% c	-
Reliable program	1%	2% bc	-	-
Can use own AC technician	<1%	-	1%	-
NET: Energy Savings	**7%**	**11% b**	**3%**	**7%**
NET: Don't Like It	**2%**	**-**	**3% a**	**11% ab**
Other	**3%**	1%	4% a	7% a
Don't know	**10%**	-	16% a	25% a

On the negative side, customers don't like the unknown aspect of cost (the program description did not include this) and they have concerns about the on-going expense (of service maintenance agreements). Those with low interest in the program mentioned a negative about PG&E's involvement (though PG&E is a positive for those who high interest) and that they already have a maintenance program.

TABLE 75. TOP OF MIND COMMENTS ABOUT HVAC QM: NEGATIVES

Negative Comments	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
No estimate of cost/ongoing expense	**31%**	**24%**	**40% a**	**31%**
PG&E should not be involved	**8%**	**6%**	**6%**	**18% ab**
NET: Program Details	**8%**	**8%**	**9%**	**5%**
Multiyear commitment	3%	2%	5% a	2%
Want to use my own contractor	2%	2%	3%	4%
Service calls too frequent	2%	2% c	3% c	-
Don't trust contractors	**7%**	**6%**	**9%**	**9%**
Sounds intrusive/complicated/inconvenient	**6%**	**6%**	**6%**	**5%**
Not appropriate for my AC (too old/too new)	**5%**	**3%**	**6%**	**7%**
Like it (general)	**4%**	**9% bc**	**-**	**-**
Already have maintenance program	**4%**	**1%**	**4% a**	**18% ab**
Don't like it (general)	**1%**	**-**	**1%**	**2%**
Other	**5%**	**5%**	**4%**	**5%**
Don't know	**29%**	**40% bc**	**23% c**	**11%**

Customers, even with high interest, do have significant concerns. The top three concerns are about the cost effectiveness of HVAC QM. Secondarily, customers have concerns related to the contractor – the requirement that the customer must make all the improvements that are recommended, and finding the right contractor.

TABLE 86. CUSTOMER CONCERNS ABOUT HVAC QM

Concerns	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
Keeping the AC improvements within your budget or so they are affordable to you	66% 93%	66% c	72% c	47%
Getting a large enough rebate compared to the total cost	62% 93%	59%	66%	59%
Achieving enough energy savings to justify the cost of the AC improvements	60% 92%	57%	64%	58%
In order to qualify for the rebate, you must make all the improvements that are recommended by the contractor	52% 90%	47%	59% a	54%
The contractor recommends which improvements you should make (e.g. you wouldn't trust that all the recommended improvements are needed)	36% 88%	30%	38%	49% a
Finding the right AC contractor that is licensed and reputable	41% 79%	41%	39%	51%
Getting financing to pay for the improvements	35% 65%	36%	32%	39%
Having a participating AC contractor conduct the initial assessment of your central AC system	16% 56%	12%	15%	33% ab
You need few, if any, improvements. Your central AC is already energy efficient	17% 54%	12%	17%	34% ab
Your AC system is old, so it might cost too much to improve or is not worth improving	28% 50%	28%	28%	27%
Having the program sponsored by PG&E	17% 41%	15%	16%	27% ab

Major Concern Minor Concern

The top positive is the potential for improving the affordability of AC improvements. Additionally, customers like that assessments and repairs are performed to industry standards, that they have options (which is probably related to affordability), and that contractors are screened by PG&E.

TABLE 97. EVALUATION OF HVAC QM: RATING OF ATTRIBUTES

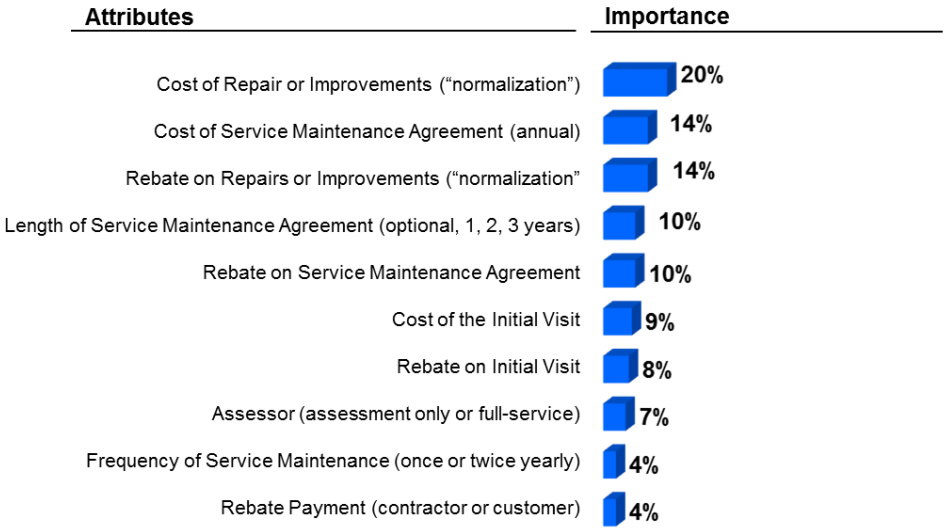
Positives	% of Total (n=410)	Program Interest: High (n=194) a	Program Interest: Neutral (n=160) b	Program Interest: Low (n=55) c
The program can make AC improvements more affordable	72% / 97%	85% bc	65% c	51%
Assessments and repairs will be done in accordance with the ACCA Standard 4, which is an industry "best practices" guideline	54% / 94%	64% bc	47% c	33%
It gives me options and ways to customize my participation	42% / 93%	47% c	40%	30%
Participating contractors will be screened by PG&E	42% / 85%	50% bc	38% c	22%
Having a participating AC contractor conduct the initial inspection of your central AC system	26% / 85%	34% bc	19%	14%
The participating contractor recommends which improvements you should make	17% / 75%	21% c	16%	9%
The program is sponsored by PG&E	33% / 74%	41% bc	29% c	10%

Major Positive Minor Positive

"Importance" ratings of the program attributes derived from the Conjoint Analysis are shown below. The costs (charged by the contractors) are more important to customers than the rebates – which makes sense because the costs are nearly always greater than the rebate amounts.

- Also repair and service maintenance costs are more important than the cost of the initial visit, which suggests that rebate dollars will have more impact when applied to these two areas (though not applied exclusively here).

TABLE 108. IMPORTANCE OF HVAC QM ATTRIBUTES



Respondents were asked to select their most preferred option across several program attributes. Customers overall prefer an assessor who only does assessments, and a rebate paid directly to the contractor.

- However, customers with higher program interest have greater interest in an assessor who can also perform repairs and maintenance.

TABLE 119. HVAC QM ATTRIBUTE PREFERENCES: ASSESSOR AND REBATE PAYMENT

		Program Interest		
Assessor	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Assessor who only does assessments – you would need to choose another participating AC contractor to complete the recommended repairs or improvements	57%	52%	59%	65% a
Assessor can do both the assessment and any recommended repairs or improvements	43%	48% c	41%	35%
Rebate Payment				
Rebate is paid directly to the contractor so the customer pays the contractor the balance (total minus the rebate) at the time of service	60%	62% c	64% c	40%
Rebate is paid to the customer, so the customer pays the contractor the full amount at the time of service and receives	40%	38%	36%	60% ab

A majority of customers (69%) want the service maintenance to be optional, although more customers with higher program interest are interested in mandatory maintenance. – likely customers who already see value in on-going service maintenance.

- A majority wants visits just once per year; yet again those with greater interest in the program are more interested in a higher level of service, with twice yearly visits.

TABLE 20. HVAC QM ATTRIBUTE PREFERENCES: LENGTH OF AGREEMENT AND FREQUENCY OF VISITS

		Program Interest		
Length of Service Maintenance Agreement	% of Total (n=410)	High (n=194) a	Neutral (n=160) b	Low (n=55) c
Mandatory 3 years	7%	12% bc	3%	4%
Mandatory 2 years	9%	11% c	8% c	2%
Mandatory 1 years	15%	19% c	14% c	5%
Optional	69%	58%	75% a	89% ab
Frequency of Service Visits				
Once a year	60%	53%	64% a	73% a
Twice a year	40%	47% bc	36%	27%

Customers' willingness to pay was evaluated by customers providing "fair and reasonable" amounts where they are likely to sign up for the program. The mean amount for the initial visit is $72 overall, but $80 for those with the highest likelihood of participating. The mean for the annual maintenance agreement is $98 overall, and $112 for those with the highest participation likelihood.

- Note that these amounts were given before customers reviewed or considered incentive amounts, so these values are essentially the customer's net willingness to pay (total cost less incentive).

TABLE 212. WILLINGNESS TO PAY: INITIAL VISIT AND ANNUAL MAINTENANCE

		Program Interest		
Initial Visit Cost	% of Total (n=410)	High (n=194) a	Neutral (n=160) b	Low (n=55) c
$0 - $49	23%	16%	27% a	38% a
$50 - $99	48%	52% c	48% c	35%
$100 - $149	20%	20%	21%	16%
$150 - $199	4%	6% b	1%	7% b
$200 or more	4%	6%	3%	4%
Mean	$72	$80 b	$64	$66
Annual Maintenance Agreement Cost				
$0 - $49	11%	8%	10%	27% ab
$50 - $99	37%	31%	42% a	40%
$100 - $149	36%	39% c	38% c	22%
$150 - $199	9%	12% b	5%	7%
$200 or more	8%	10% bc	6%	4%
Mean	$98	$112 bc	$89 c	$73

Customers prefer that the rebates are provided in fixed dollar amounts rather than as percentages of the cost.

- A final question asked during the Conjoint Analysis was whether or not the customer would actually participate in this program. A majority (58%) said they would. This is consistent with their high interest in the program, and in AC maintenance in general.

TABLE 22. HVAC QM REBATE BASIS AND FINAL CHOICE

		Program Interest		
Rebate Basis: $ or %	% of Total (n=410)	High (n=194) a	Neutral (n=160) b	Low (n=55) c
Rebate computed in Dollars	64%	60%	65%	76% ab
Rebate computed in Percentages	36%	40% c	35% c	24%
Final Choice: Participate or Not				
Yes	58%	76% bc	49% c	24%
No	42%	24%	51% a	76% ab

The Conjoint Analysis provides a simulation of customer preference for different program options.

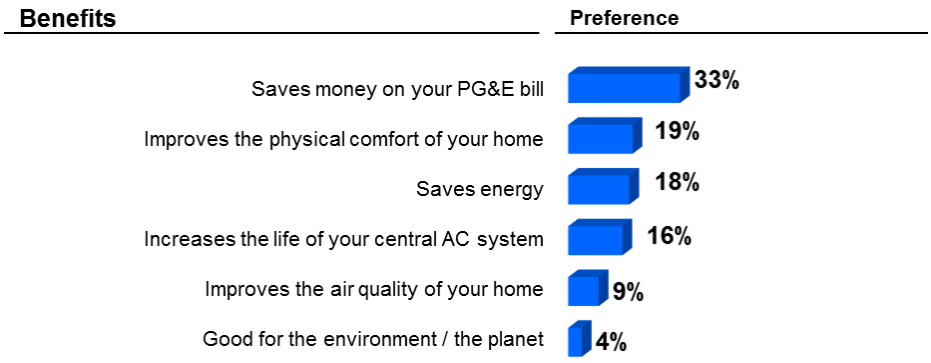
- In the example below, changes to the incentive amounts are tested. Other possibilities can be tested through the simulation program.

TABLE 23. CONJOINT ANALYSIS: SIMULATION OPTIONS

	TESTED OPTIONS			
ATTRIBUTES	**V1**	**V2**	**V3**	**V4**
Assessor	full service	full service	full service	full service
Length of Service Maintenance Agreements	optional	optional	optional	optional
Frequency of Service Maintenance Agreements	2x yearly	2x yearly	2x yearly	2x yearly
Rebate Payment	contractor	contractor	contractor	contractor
Cost of the Initial Visit	$150	$150	$150	$150
Rebate on Initial Visit	$100	$50	$50	$100
Costs of Repairs or Improvements	$600	$600	$600	$600
Rebate on Repairs or Improvements	$300	$300	$400	$400
Annual cost Cost of Service Maintenance Agreement	$150	$150	$150	$150
Rebate on Service Maintenance Agreement	$100	$150	$50	$100
Share of Preference Rating	**38.98**	**43.11**	**33.99**	**47.45**
None	**61.02**	**56.89**	**66.01**	**52.55**

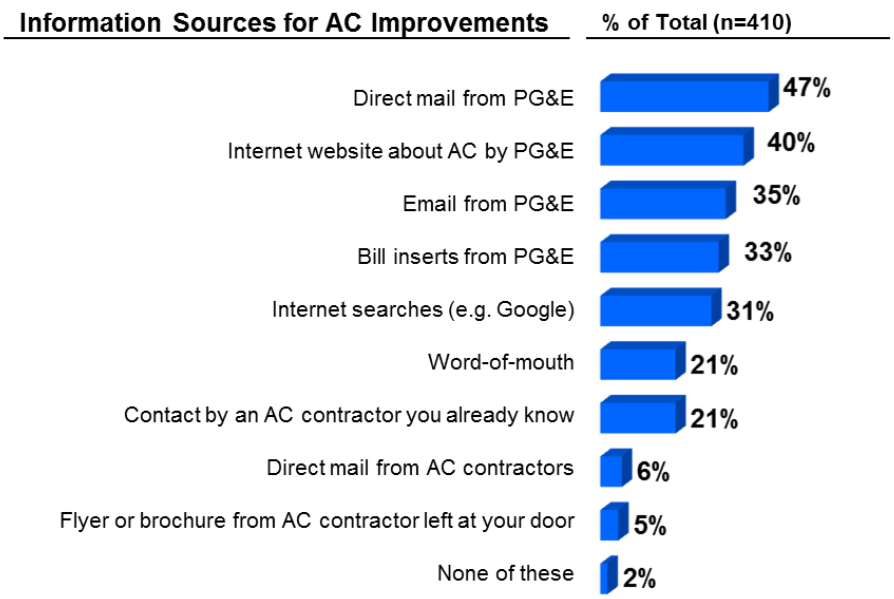
Customers were given a list of benefits in a series of paired comparisons, and asked which benefit is most important regarding their decision about participating in the HVAC QM program. "Saving money on the PG&E bill" is the most motivating benefit by a large margin. "Improving the physical comfort of your home" and "saving energy" are second and third, but are relatively close in importance. "Increasing the life of the central AC system" is fourth, though not far behind the two previous benefits.

TABLE 24. IMPORTANCE OF BENEFITS OF HVAC QM



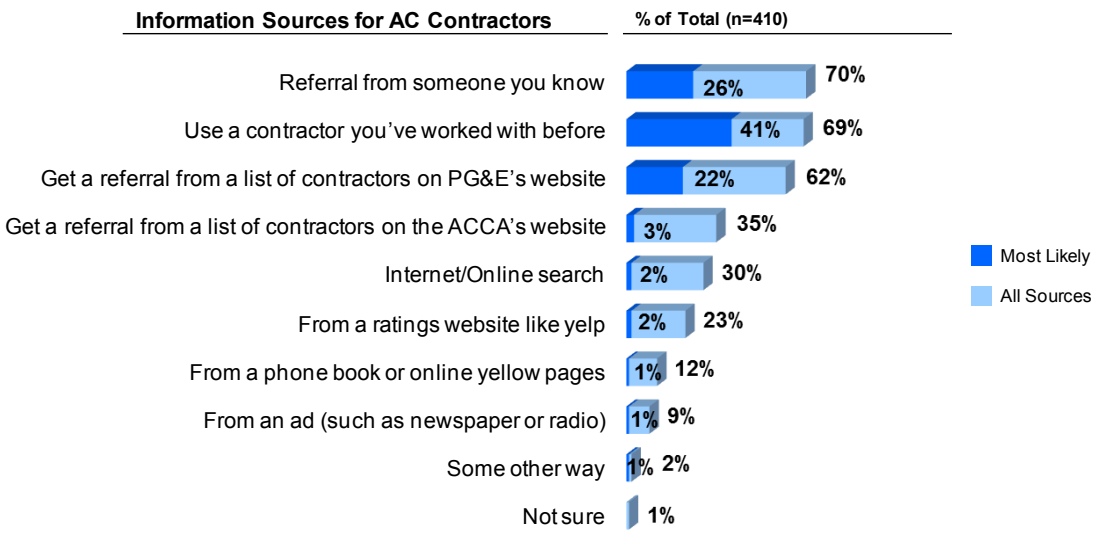
Customers rated information sources based on usefulness regarding AC system improvements – PG&E sources are at the top, including direct mail, a website, email, and bill inserts.

TABLE 25. INFORMATION SOURCE PREFERENCES FOR HVAC IMPROVEMENTS



Customers were also asked about their preferences regarding finding an HVAC contractor. To find a contractor, customers would like to use one they've worked with before, or get a referral from either someone they know or from a list on PG&E's website. All other sources are far less appealing.

TABLE 26. FINDING A CONTRACTOR



Past program participation is consistent with customer demographics (i.e., homeowners with central AC) – nearly half (47%) have participated in rebates before, one in three (33%) have recycled an appliance, and one in five (20%) have participated in SmartAC.

- Customers who have participated in SmartRate, CARE, California Solar Initiative, and ClimateSmart are more likely to be interested in HVAC QM.

TABLE 27. PAST PG&E PROGRAM PARTICIPATION

Program Participation	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
Rebates (appliances, insulation)	47%	49%	46%	40%
Appliance recycling	33%	32%	34%	35%
SmartAC	20%	19%	20%	20%
Balanced or level payment plan	18%	20%	17%	15%
Have energy surveys	11%	12%	10%	7%
SmartRate	6%	9% b	4%	5%
CARE	6%	8% c	5% c	-
California Solar Initiative	4%	7% c	3% c	-
ClimateSmart	2%	2% c	3% c	-
Energy Upgrade California (whole house)	2%	3%	1%	2%
Energy Partners	1%	1%	1%	2%
Others	1%	1%	3%	-
Not Sure	5%	4%	6%	4%
None of these	20%	19%	20%	24%

DEMOGRAPHICS

Customers with higher interest in the program tend to be 45-54 years old (even though customers 55+ are more likely to have service maintenance agreements). Otherwise, age does not have much effect on program interest. Also, males appear to have higher interest than females, but not significantly.

TABLE 28. RESPONDENT DEMOGRAPHICS: AGE AND GENDER

		Program Interest		
Age	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
18-34 years	4%	5%	4%	4%
35-44 years	13%	14%	10%	18%
45-54 years	22%	22% c	27% c	11%
55-64 years	37%	40% b	31%	45% b
65-74 years	19%	18%	22%	16%
75 or older	4%	3%	6% a	4%
Prefer not to state	<1%	-	-	2%
Gender				
Male	50%	51%	50%	44%
Female	50%	49%	50%	56%

Education and income levels are shown below. Education is not related to program interest. Those with higher program interest are more likely to state their income – unpinning this might be greater trust in PG&E.

TABLE 29. RESPONDENT DEMOGRAPHICS: EDUCATION AND INCOME

		Program Interest		
Education	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Less than College Grad	**32%**	30%	33%	35%
College Graduate	**42%**	70%	66%	64%
Masters or Doctorate Degree	**26%**	27%	25%	22%
Prefer not to state	**<1%**	-	1%	2%
Income				
Less than $75K	**20%**	21%	20%	18%
$75K to less than $100K	**18%**	22% b	14%	15%
$100K to less than $150K	**28%**	23%	31% a	31%
$150K or more	**18%**	22% c	16% c	7%
Prefer not to state	**17%**	11%	19% a	29% a

Consistent with being homeowners, most survey respondents are married (or living with a significant other). Interestingly, single people (not living with a spouse or significant other) have higher interest in the program – perhaps they feel less confident dealing with contractors on their own.

TABLE 30. RESPONDENT DEMOGRAPHICS: PEOPLE IN THE HOUSEHOLD

		Program Interest		
Others Living in Home	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Spouse or Significant Other	86%	80%	91% a	89% a
Children	37%	40%	33%	40%
Other Relatives	5%	5%	5%	2%
Parents	2%	4% c	1%	-
Roommates	1%	1%	1%	2%
No one else	7%	9% c	6%	4%
Prefer not to state	<1%	-	-	4%
No. Living in Home				
One	7%	8%	6%	5%
Two	38%	36%	43%	35%
Three to Four	23%	24%	21%	25%
Five or more	7%	7%	8%	5%
Prefer not to state	25%	25%	23%	29%

Most survey respondents are white, but those with a Hispanic background have higher interest in the program.

TABLE 31. RESPONDENT DEMOGRAPHICS: ETHNICITY

Ethnicity	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
White or Caucasion	83%	85%	83%	76%
Asian or Pacific Islander	6%	6%	7%	7%
Hispanic or Latino	3%	5% bc	1%	-
African American	1%	1%	-	2%
Native American	1%	2%	-	2%
Mixed	2%	1%	3%	-
Other	1%	1%	1%	-
Prefer not to state	4%	1%	5% a	13% a

The age and condition of the home have little relationship to customers' interest in the program, except that the few who evaluate the energy efficiency of their home as "very poor" are more interested.

TABLE 32. HOME CHARACTERISTICS: AGE AND CONDITION OF HOME

		Program Interest		
Year Built	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Before 1960	9%	10%	10%	5%
1960 to 1969	9%	8%	9%	7%
1970 to 1979	19%	19%	19%	20%
1980 to 1989	19%	18%	18%	25%
1990 to 2000	20%	18%	23%	22%
2000 or newer	24%	28%	21%	20%
Not sure	<1%	1%	-	-
Mean	1984	1984	1983	1986
Energy Efficiency of Home				
Excellent	7%	7%	6%	13%
Very Good	30%	32%	27%	33%
Good	40%	36%	44%	40%
Fair	15%	15%	16%	13%
Poor	6%	6%	7%	2%
Very Poor	2%	3% c	1%	-
Not Sure	<1%	1%	-	-

Most homes among survey respondents are relatively large (average of 2,300 square feet). Those in the smallest homes (under 1,500 sq. ft.) have higher program interest.

TABLE 33. HOME CHARACTERISTICS: SIZE AND VALUE OF HOME

		Program Interest		
Square Feet of Home	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Under 1,500	8%	9% c	9% c	2%
1,500 to 1,999	30%	27%	29%	40% a
2,000 to 2,499	28%	30%	24%	29%
2,500 to 2,999	17%	16%	19%	15%
3,000 or more	18%	18%	19%	15%
Mean	2,297	2,309	2,298	2,247
Value				
Less than $200K	18%	21%	16%	15%
$200K to less than $300K	22%	25%	19%	20%
$300K to less than $500K	26%	23%	29%	29%
$500K to less than $700K	14%	13%	15%	13%
$700K or More	14%	14%	14%	13%
Not Sure	3%	3%	4%	5%
Prefer Not to State	2%	1%	4% a	5%

Though the difference is not quite significant, those who intend to stay in their homes longer (11 or more years) are more likely to be interested in the program – likely because they feel they have more to gain from on-going maintenance if it improves reliability and longevity of their AC system.

TABLE 34. YEARS IN HOME: PAST AND FUTURE INTENDED

		Program Interest		
Years Lived in Current Home	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
0 to 10 years	**45%**	47%	42%	49%
11 or more years	**54%**	52%	58%	51%
Not Sure / Prefer Not to State	**<1%**	1%	1%	-
Additional Years Intending to Stay				
0 to 10 years	**43%**	41%	43%	47%
11 or more years	**52%**	56% c	50%	42%
Not Sure / Prefer Not to State	**5%**	3%	7% a	11% a

Energy-related features in the home have little bearing on interest in HVAC QM, except that customers with solar are more likely to be interested.

TABLE 35. HOME CHARACTERISTICS: ENERGY-RELATED FEATURES OF THE HOME

Energy-Related Features of the Home	% of Total (n=410)	Program Interest: High (n=194) a	Neutral (n=160) b	Low (n=55) c
Gas central heating	78%	79%	74%	84%
Double or triple paned windows	78%	78%	76%	84%
Attic insulation that meets current standards	66%	69%	62%	69%
Wall insulation that meets current standards	57%	58%	55%	60%
Swimming pool or spa	33%	32%	35%	29%
Electric central heating	29%	26%	32%	31%
Whole house fan	25%	25%	24%	27%
Solar electricity panels	4%	6% c	3% c	-
Solar water heating	4%	5%	3%	2%

Average summer and winter bill amounts are relatively high, but consistent with homes with central AC occupied by homeowners. Customers' bill amounts are not related to their interest in the HVAC QM program.

TABLE 36. HOME CHARACTERISTICS: AVERAGE SUMMER AND WINTER ENERGY BILLS

		Program Interest		
Average Summer Electricity & Gas Bill	**% of Total (n=410)**	**High (n=194) a**	**Neutral (n=160) b**	**Low (n=55) c**
Less than $200	**30%**	31%	29%	27%
$200 to $299	**32%**	31%	30%	40%
$300 or more	**39%**	38%	41%	33%
Mean	$296	$291	$301	$298
Average Winter Electricity & Gas Bill				
Less than $200		41%	38%	38%
$200 to $299		25%	28%	31%
$300 or more		21%	27%	24%
Mean	$238	$226	$244	$264

CONCLUSIONS

AC Condition and Usage

Only 35% of homeowners rate their central AC system "excellent" regarding energy efficiency (primarily those with new systems (less than 5 years old). Those who don't are interested in improving this. Customers also want to improve comfort and system longevity.

Regarding current maintenance practices, most homeowners change their filters, and they do so, on average 2-3 times per year. Only one in five (21%), though, has a current service maintenance agreement, for which they get 1-2 visit per year, at an average cost of $100 per visit. Two-thirds believe it is "definitely worth it."

Among customers without on-going service maintenance agreements, about half have had a tune-up completed of their system and paid an average of $125. Only 30% said it was "definitely worth it."

- Recommendation: While on-going service is highly valued by those who have it, tune-ups are not so highly valued, so differentiating the program's initial visit from a tune-up will be critical.

Customer Response to the HVAC Quality Maintenance (QM) Program

Customer interest in HVAC QM is quite strong – 47% rate their interest an 8-10 (10-point scale) and another 39% rate their interest 5-7. Top positives are (1) incentives make efficiency more affordable, (2) based on ACCA standards, and (3) contractors are approved by PG&E. Main barriers are about (1) cost effectiveness, (2) working with contractors (having to implement all of the recommended improvements, and (3) finding a good contractor to work with).

- Recommendation: These positives and barriers should be considered in program design, implementation, and messaging.

Regarding program design, customers have a slight preference for: (1) an assessor who does only assessment (but customers with an existing contractor relationship prefer their own contractor who is full-service), (2) rebate is paid to the contractor rather than the customer, (3) service maintenance visits are once a year (rather than twice), and (4) maintenance service is optional, not mandatory.

- Recommendation: These preferences can be considered for program design.

Regarding costs, customers want the initial visit not to cost more than $75 (after rebate), and service maintenance not to cost more than $100 per year (after rebate).

Top program benefits are: (1) saving money on their PG&E bill, (2) increasing comfort of their home, (3) saving energy, and (4) increasing longevity of their central AC.

- Recommendation: These benefits can be included in program messaging.

Customer communication preferences include: (1) direct mail from PG&E, (2) a PG&E website, (3) email from PG&E, and (4) PG&E bill inserts. Customers are less interested in hearing about the program from contractors.

- Recommendation: Program messaging should come primarily from PG&E.

To find a contractor, customers want to use one they've already worked with, or to get one by referral from a friend or from PG&E.

- Recommendation: Program marketing should leverage contractors existing relationships (for customers who already work with a contractor), and provide referrals to approved contractors (for customers without).

APPENDICES

The quantitative survey included a conjoint analysis. Details are described in Appendix A.

The qualitative discussion guides from the contractor interviews and focus groups, and the quantitative research instrument follow in Appendix B.

APPENDIX A: CONJOINT ANALYSIS REVIEW

One component of the survey is a Conjoint Analysis. Key results are included in the quantitative survey section of this report. A more detailed description of the Conjoint Analysis is described here.

The Conjoint Analysis requested that customers chose their "most preferred" program alternative from three randomly-generated options. The options were created from different combinations of the following "attributes," and "levels" within each attribute:

1) Assessor
   a. Assessor who only does assessments (does not perform QM or repair services)
   b. Assessor can do the assessment, QM services, and any necessary repairs

2) Length of Service Maintenance Agreements
   a. Mandatory for 3 years
   b. Mandatory for 2 years
   c. Mandatory for 1 year
   d. Optional

3) Frequency of Service Maintenance Agreements
   a. Maintenance service visits are once a year
   b. Maintenance service visits are twice a year

4) Rebate Payment
   a. Rebate paid directly to the contractor
   b. Rebate paid to the customer

5) Cost of the Initial Visit
   a. $50
   b. $100
   c. $150
   d. $200

6) Rebate on Initial Visit
   a. $0
   b. $25
   c. $50
   d. $75
   e. $100

7) Costs of Repairs or Improvements
   a. No repairs needed
   b. $200
   c. $400
   d. $600
   e. $800

8) Rebate on Repairs or Improvements
   a. $0

b. $100
c. $200
d. $300
e. $400

9) Annual Cost of Service Maintenance Agreement
   a. $50
   b. $100
   c. $150
   d. $200

10) Rebate on Service Maintenance Agreement
   a. $0
   b. $25
   c. $50
   d. $75
   e. $100

Analysis of these choices produces two indexes: (1) a measure of the importance of each "attribute," and (2) a measure of preference for each "level" within an attribute. Additionally, the results can be used to compare between different program alternatives to determine which unique combination of "levels" across the attributes is most appealing.

CONJOINT ANALYSIS RESULTS

Key findings from the Conjoint Analysis are discussed next.

Importance of Attributes

The attributes are rank ordered and "scaled" in the table that follows.

TABLE A13. CONJOINT ATTRIBUTE IMPORTANCE SCORES

	Rank Order	Importance
Cost of Repair or Improvements ("normalization")	1	20.3
Cost of Service Maint. Agreement (annual)	2	14.2
Rebate on Repairs or Improvements ("normalization")	3	13.9
Length of Service Maint. Agreement (optional, 1,2,3 years)	4	10.3
Rebate on Service Maint. Agreement	5	10.2
Cost of the Initial Visit	6	8.5
Rebate on Initial Visit	7	8.0
Assessor (assessment only or a full-service)	8	6.9
Frequency of Service Maintenance (once or twice yearly)	9	4.2
Rebate Payment (contractor or customer)	10	3.6

These "importance" results have the following implications:

- Costs (charged by the contractor) are more important to customers than the rebates – which makes sense because the costs are nearly always greater than the rebate amounts.
- Repair costs (to bring the system up the ACC standards) and service maintenance costs are more important than the cost of the initial visit. This suggests that rebate dollars will have more impact on customer preference for the program overall if applied first to the repairs and improvements, and second, to the service agreements.
    - Although repair and improvement costs are not known at the time that the customer would sign up for the initial visit, a repair cost that is too high (and not offset enough by the rebate) will have a big influence on the customer's decision about whether or not to go forward with making the improvements and then participating in a service maintenance contract.
- Costs matter a lot more to customers than do the other attributes, with the exception that the length of the service maintenance agreement has relatively high importance –differences in these lower-importance attributes won't have as much impact on overall customer participation as differences in the higher importance attributes.

The "utility" scores for each of the "levels" within attributes are shown in the table below. The largest positive values of a "level" within an attribute is the "level" that is most preferred, and the largest negative value is the least preferred "level." The utility scores are normed around "0," so keep in mind that positive and negative values do not

necessarily mean that respondents like the positive "levels" and dislike the negative ones.

TABLE A2. COST OF REPAIRS OR IMPROVEMENTS

Level	Utility Score
No repairs needed	93.83
$200	52.36
$400	3.31
$600	-47.42
$800	-102.09

TABLE A3. COST OF SERVICE MAINTENANCE AGREEMENT (ANNUAL)

Level	Utility Score
$50	66.08
$100	26.83
$150	-27.51
$200	-65.41

TABLE A4. REBATE ON REPAIRS OR IMPROVEMENTS

Level	Utility Score
$400	62.92
$300	31.82
$200	1.69
$100	-29.73
$0	-66.70

The utility scores are very linear for "cost of repairs or improvements," "cost of service maintenance agreement," and "rebate on repairs or improvements" – each incremental dollar amount is valued about the same as the next. In other words, we do not see evidence of diminishing returns for these attributes, so each additional dollar in cost reduction (from the contractor) or incentive (from PG&E) will boost customer preference for the program as well as the first dollar applied here.

TABLE A5. LENGTH OF SERVICE MAINTENANCE AGREEMENT

Level	Utility Score
Optional	31.93
Mandatory for 1 year	15.61
Mandatory for 2 years	-13.43
Mandatory for 3 years	-34.11

Regarding length of the service agreement, the difference in utility scores for "optional" and "mandatory for 1 year" is about 16 points, but the gap between "mandatory for 1 year" and "mandatory for 2 years" is about 29 points. This implies a bigger drop in preference from the 1 year to 2 years mandatory agreement. Customers most prefer an optional contract, but they would accept a one year contract without too many drop-

outs. A 2 year contract would give substantially more customers a reason not to participate.

TABLE A6 REBATE ON SERVICE MAINTENANCE AGREEMENT

Level	Utility Score
$100	43.21
$75	20.73
$50	0.25
$25	-23.67
$0	-40.53

Similar to the "cost of repairs," "cost of the service agreements," and "rebate on repairs," the utility scores for the different levels of the "rebate on the service maintenance agreements" are very linear. Each additional dollar allocated here has a similar, positive impact on customer preference.

TABLE A7 COST OF THE INITIAL VISIT

Level	Utility Score
$50	33.98
$100	7.35
$150	-2.50
$200	-38.82

Unlike the other "cost" and "rebate" attributes, the utility scores for the "cost of the initial visit" are not linear. There is a drop off from $50 to $100, suggesting that $50 is most appealing, and that $100 gives some people reason to not participate. The difference between $100 and $150 is relatively small, so increasing the cost of the visit from $100 to $150 won't lose very many customers. The gap between utility scores is greatest between $150 and $200. A conclusion is that $200 is beyond the range of acceptability for many people.

TABLE A8. REBATE ON THE INITIAL VISIT

Level	Utility Score
$100	24.97
$75	12.49
$50	-0.78
$25	-9.34
$0	-27.34

The "rebate on the initial visit" is again linear, with the exception that the first $25 has slightly more impact on overall program favorability than the next $25, $50, or $75.

TABLE A9. ASSESSOR'S ROLE

Level	Utility Score
Assessor can do the assessment, QM services and any necessary repairs	2.30

Assessor who only does assessments (does not perform QM services)	-2.30

Customers prefer an assessor (the HVAC contractor who does the initial visit) who can also do repairs, but not by a big margin. Customers are not as concerned about this attribute compared to the cost and rebate-related attributes, and there is almost as many who would prefer an assessor who only does assessments as would prefer the full-service assessor.

TABLE A10. FREQUENCY OF SERVICE MAINTENANCE

Level	Utility Score
Maintenance service visits are once a year	0.23
Maintenance service visits are twice a year	-0.23

The utility scores are near zero, so customers are almost equally split regarding their preference for once a year or twice a year. Once a year has a slight edge.

TABLE A11. REBATE PAYMENT

Level	Utility Score
Rebate paid to the customer	2.51
Rebate paid to the contractor	-2.51

This attribute has the lowest importance score, which means it has the least impact on customer choices. Customers have a slight preference for rebates paid to themselves over rebates paid to the contractor, but neither payment option will have much effect on overall customer interest in or preference for the program.

Conjoint Simulations

The Conjoint Analysis allows direct comparison between different program designs. For example, it can test the incremental impact on customer preference of reallocating rebate dollars between the initial visit, the cost of repairs, and the service maintenance agreements. Please provide HINER & Partners with any program designs and individual variables that you want to test. An example that HINER developed is shown below.

In the following example, we held all attributes constant except for the rebate amounts, which we varied.

In V1, the rebate for initial visit is $100, the rebate for repairs is $300, and the rebate for the service maintenance agreement is $100. The "share of preference" is 38.98% - this is the percent of respondents who would pick this option is given a choice between this option and nothing.

In V2, we reallocate $50 of rebate money from the initial visit to the service maintenance. Share of preference for V2 is 43.11% - which means that customers like Option V2 a bit more than V1.

In V3, we move $100 of rebate money from the service maintenance agreement to repairs and improvements. V3's share of preference 33.99%, a substantial drop compared to V2.

In V4, we add $100 to the repair rebate in the V1 option. Preference of V4 is 47.45%, a substantial improvement over 38.98% in V1.

TABLE A12. HVAC CONJOINT ANALYSIS SIMULATIONS

HVAC CONJOINT ANALYSIS OPTIONS SIMULATIONS				
	TESTED OPTIONS			
ATTRIBUTES	**V1**	**V2**	**V3**	**V4**
Assessor	2	2	2	2
Length of Service Maintenance Agreements	4	4	4	4
Frequency of Service Maintenance Agreements	2	2	2	2
Rebate Payment	1	1	1	1
Cost of the Initial Visit	150	150	150	150
Rebate on Initial Visit	100	50	50	100
Costs of Repairs or Improvements	600	600	600	600
Rebate on Repairs or Improvements	300	300	400	400
Annual cost Cost of Service Maintenance Agreement	150	150	150	150
Rebate on Service Maintenance Agreement	100	150	50	100
Share of Preference Rating	**38.98**	**43.11**	**33.99**	**47.45**
None	**61.02**	**56.89**	**66.01**	**52.55**

Max Diff Background

In addition to the Conjoint Analysis, survey respondents completed a "max diff" choice exercise. In this exercise, respondents evaluated the benefits of participation – three at a time. Respondents were asked, "Please consider how important different benefits are when choosing to participate in a HVAC QM program. Considering only these 3 benefits, which is the Most Important and which is the Least Important to you when deciding to participate in the above HVAC program?"

The six benefits that were evaluated include:

1) Improves the physical comfort of your home
2) Saves money on your PG&E bill
3) Saves energy
4) Good for the environment / the planet
5) Increases the life of your central AC system
6) Improves the air quality of your home

Each respondent completed this task 6 times. Results from these choices provided (1) the rank order of the six benefits, and (2) a measure of perceptual preference compared to the other benefits.

Max Diff Results

The table below shows the results from the Max Diff exercise. The preference scores are "scaled" and normed so that total preference equals 100. Preference scores that are nearly the same mean that the benefits have nearly identical preference. A preference score for a benefit that is twice the score of another benefit means that the higher scoring benefit is preferred by twice as many respondents.

TABLE A143. HVAC QM BENEFIT EVALUATIONS

Benefit	Rank Order	Preference
Saves money on your PG&E bill	1	33.2
Improves the physical comfort of your home	2	18.4
Saves energy	3	18.2
Increases the life of your central AC system	4	15.7
Improves the air quality of your home	5	9.4
Good for the environment / the planet	6	4.2

These results indicate that:

- "Saving money on your PG&E bill" is the most motivating benefit by two to one over the next highest ranked benefit
- "Improving the physical comfort of your home" is ranked second, but "saving energy" is a very close third
- "Increasing the life of the central AC system" is fourth, but nearly as motivating as physical comfort and saving energy.
- "Improving the air quality of your home" is fifth – it's important to relatively few people.
- "Good for the environment" is the least motivating.

Based on these preferences, messaging could lead with "saving money," and include mention of "improving comfort," "saving energy," and "increasing the life of your central AC."

APPENDIX B: DISCUSSION GUIDES AND QUANTITATIVE RESEARCH INSTRUMENT

RESIDENTIAL
HVAC CONTRACTOR
ONE-ON-ONE INTERVIEW GUIDE

INTRODUCTION (10 minutes)

OBJECTIVE: Create an atmosphere for open discussion and brainstorming

- Moderator Introduction:
  - Steve Westberg, independent market researcher, etc.
  - Leading the interview today – unbiased 3rd party
  - Audio recording
  - Confidentiality

- Objective/Topic of Discussion: Objective/Topic of Discussion: PG&E is working with the HVAC industry to develop an incentive program that would encourage more residential customers to enter into quality maintenance service agreements with HVAC contractors. The objective is for the homeowner to work with a contractor over time to ensure that their AC system is operating at optimum efficiency. So we want to understand your thoughts and experiences with service agreements in order to help PG&E devise an effective incentive program.

- Your Role Today: You are the expert. Share your knowledge, opinions and ideas.

- Introduction: To begin, please tell me about:
  - Your company, and the range of services your company offers (e.g., repairs, new installations, tune-ups) and to whom (are you primarily servicing residential or commercial or both; homeowners, apartments, etc.)
  - Your position in the company, how long you've been doing this, and what your main responsibilities are

Additional Background

- What licenses do you hold? (NEED C20)
- What associations do you belong to?
  - Are you listed on the Contractor's State Licensing Board (CSLB)? Why / why not?
- Have you participated, or assisted homeowners to participate, in any PG&E-sponsored programs? Which ones? (CHECK ANY MENTIONED)

_____ Whole House Energy Upgrade California Program	1
_____Quality Installation Duct Test and Seal.....	2
_____Quality Maintenance Duct Test and Seal	3
_____Quality Maintenance Refrigerant Charge and Airflow	4
_____Quality Installation Refrigerant Charge and Airflow	5
_____CheckMe Program with Proctor Engineering Group	6
_____Enalasys RCA/DTS Program.....	7
_____Verified RCA/DTS Program	8
_____Field Diagnostics (FDSI) RCA Program	9
_____AC Tune-up Program	10
_____ OTHER _____	11
_____ OTHER _____	12
None	98
Not sure/Don't know.....	99

CONTRACTOR BELIEFS ABOUT SERVICE AGREEMENTS (15 minutes)
OBJECTIVES: (1) warm-up discussion, (2) understand contractors opinions about service agreements, (3) understand what contractors know about the customers decision process regarding HVAC repairs and maintenance

A. Let's first talk about the HVAC business in general.
   1. What do you think does the industry needs to do to improve the HVAC maintenance and repair business?
   2. What is your busiest season for installation? Maintenance?
      i. Is there anything else that creates busy times?
   3. How often do you fix HVAC systems that have broken vs. doing service to maintain working HVAC systems?
      i. What's an average per ticket cost to the customer of a repair?
      ii. What's an average per ticket cost to the customer for a maintenance visit?

B. Let's talk about HVAC service contracts. Do you offer them?
   [YES]
   1. Can you describe the service agreements that you offer?
      - What does the customer receive?
      - How much do they cost?
      - How long are they good for?
      - How often do you visit the home?

   2. Why do you offer them? What's in it for you?
      - Tell me about some of your experiences with service agreements – customer interactions both good and bad, etc.
      - How did you get started offering service contracts? What prompted you to offer them?
      - How important are service agreements to your business? Are they a significant factor, or just an extra offering? What percent of your customers have service contracts?
      - What are the main benefits to you?
      - What are the main benefits to the customer?

   3. How do you "Sell" service agreements to customers?
      - Do you advertise in newspapers, email, direct mail or other ways to sell seasonal service calls?
      - Do service calls lead to service agreements?
      - Do you promote service agreements to all customers or just some?
      - What do you tell customers about service agreements?
      - What arguments do customers have against service agreements?
      - What happens at renewal time?
        - How do you encourage renewals?
        - Are there any you don't renew? Why don't they renew?

   4. How did you determine what to charge for the agreements?

[NO]

5. Why don't you offer service agreements?
    - What are all the reasons that you do not offer them? PROBES: awareness or knowledge about them, concerns or expected problems from contracts, past experiences, etc.
    - What problems or hassles do you think can come about from service agreements? (PROBES: For you the contractor, for customers)
    - Do service agreements have a role in the HVAC industry? Why or why not?

[ALL]

6. For whom (e.g., types of customers) do you think service contacts are best?
    - Type of person, age and condition of their HVAC system, how they use their AC, etc.

7. For whom are service agreements <u>not</u> appropriate?
    - Type of person, age and condition of their HVAC system, how they use their AC, etc.

8. PG&E is interested in service agreements because they believe that residential HVAC systems will then be maintained for optimum efficiency. Do you think this is currently true about service agreements?
    - Why or why not?
    - What are the main problems?

9. How do you think HVAC service agreements could or should be improved?
    - What would make them better for you as the contractor?
    - What would make them better for the homeowner (other than the obvious of getting more service for less money)?

AIR CONDITIONING CONTRACTORS OF AMERICA (2 minutes)

A. Are you aware of an organization called ACCA (Air Conditioning Contractors of America)?

1. [IF AWARE] Are you a member? Why / why not?

2. [IF UNAWARE] FYI, ACCA is an organization which provides consumers with lists of qualified contractors, provides education on various in-home contractor issues and sets standards on various industry concerns.

THE PG&E PROGRAM (15 minutes)

OBJECTIVE: (1) describe the PG&E program and elicit contractor reactions, (2) understand what suggestions contractors have for improvement.

PG&E is developing an enhanced Residential HVAC Quality Maintenance (QM) Program. This new program design would help customers and contractors to improve the efficiency of air conditioning systems in single-family homes, including duplexes. Participating contractors and customers would get financial incentives to bring equipment up to at least the minimum levels established by the HVAC industry-consensus ACCA Standard 4-Maintenance for Residential HVAC Systems, and to maintain it to that standard.

At the first visit, qualified, licensed contractors would complete an ACCA 4 based assessment and a customer report. The report includes recommendations and estimates for the required energy efficiency treatments, covering airflow correction and refrigeration system service. It also would include listing of any remedial measures that must precede the efficiency treatments, such as any safety and electrical issues that need to be corrected. In addition to the remedial and basic work, customers also may opt to save more energy by retrofitting their blower and/or condenser motors with higher-efficiency models. Finally, customers will be encouraged to sign up for a program-compliant maintenance agreement.

Rebates for the required and optional treatments would be paid to the contractor. Rebates for the service agreements would be paid to the contractor and/or the customer.

A. What do you think about this program?
    1. Is it understandable and does it make sense to you?
    2. What do you like about it?
    3. What don't you like?
    4. [IF APPLICABLE] Would this replace your existing service contracts, or could it be offered in addition?

B. Is this a program you would sign up for as a participating contractor?
    1. Why or why not?
    2. What would you want to know before signing up?

C. PG&E's goal is for each participating customer's HVAC system to operate as efficiently as possible.
    1. Should the maintenance service agreement be optional or be required – assuming you are completing the things I mentioned?
        - Do you think customers should be required to sign up for it before the energy efficiency measures are implemented?
    2. What else is needed for this program to meet PG&E's goal?

- Is there a minimum number of years a customer needs to have a service agreement?

D. What would make this program more appealing to you, or easier for you?

E. How would you want to promote this program?
   1. Directly from you to your customers?
   2. With assistance from PG&E?
      - What type of assistance would be most valuable to you?
        1. Customer education material concerning the value of QM
        2. Customer FAQ and what to expect from a quality contractor
        3. Training for you or your employees
        4. Other marketing and educational materials
        5. Other, please describe

F. How much do you think customers would be willing to pay for this service contract per year, which would include two visits?
   1. Give me an amount where you think just a few would sign up?
   2. Give me an amount where you think half your customers would sign up?

G. How much would you need to charge each customer for this type of service agreement with two visits per year?
   1. What would be the range of costs that you would charge for the system improvement measures we spoke about earlier – to bring the system up to the ACCA standard?

H. What else does PG&E need to consider in order to be successful with its HVAC Quality Maintenance Program?

OTHER ISSUES (5 minutes)

A. Is there a problem with unlicensed contractors in the industry?
B. Is there a problem with permits not being pulled as required?
C. Any other final comments?

If interviewee wants more information, get his/her contact info (name, title, business, email, phone #) and tell them PG&E will be in touch with them.

Thank you!

ACCA Standard 4-Maintenance for Residential HVAC Systems is an HVAC industry-consensus standard that details necessary inspection and maintenance for residential HVAC systems. The standard includes a series of checklists for varied types of residential HVAC systems, that specify minimum tasks to be performed and recommend corrective actions if deficiencies are found. Contractors may use this standard to demonstrate minimum maintenance requirements and the need to perform certain servicing tasks. The checklists also allow contractors to highlight added services offered in maintenance and service contracts.

Purpose: Establish minimum inspection requirements in the maintenance of HVAC equipment found in one-family and two-family dwellings of three stories or less

Overview:
- Homeowner interview
- Inventory
- Equipment checklists
- Code requirements
- Performance objectives
- Maintenance
    - Inspection tasks
    - Recommended corrective actions

Maintenance Contractor's Responsibilities:
- Inspect
- Inform

Homeowner's Responsibilities:
- Maintain the equipment
- Use professionals

FOCUS GROUP DISCUSSION GUIDE
RESIDENTIAL HVAC

I. INTRODUCTION *(15 minutes)*

A. WELCOME ATTENDEES. MODERATOR INTRODUCTION (EXPLAIN NOT AN EMPLOYEE OF PG&E)

B. EXPLAIN FOCUS GROUP GUIDELINES, MIRROR AND VIDEOTAPING

C. INTRODUCE TOPIC: PG&E is working with the HVAC industry to develop a program that would encourage more residential customers to work with an HVAC contractor to ensure that their AC system is operating at optimum efficiency. So, we want to understand your experiences with and thoughts about your central HVAC system. In case you don't know, HVAC stands for Heating Ventilating and Air Conditioning.

D. EXPLAIN NO "RIGHT" OR "WRONG" ANSWER, WANT HONEST OPINIONS!

E. ATTENDEE INTRODUCTIONS:

HOMEOWNERS:
Name
Occupation / Main activities
Marital / Family status / How many live there
Where you live
About your home: type, size, age, overall condition

II. USES OF ELECTRICITY IN THE HOME *(15 minutes)*

Purpose: Warm-up, Understand beliefs about HVAC energy consumption

A. Do you ever think about how much energy your household uses?

1. [IF YES] Why?
2. [IF NO] Why not?
3. You are probably not thinking about it all the time … what prompts or triggers you to think about it?

B. Tell me about the major uses of energy in your home. Let's start with the winter and then we'll talk about summer. What uses a lot of energy in your home in the winter?

1. PROBES:
   a. What appliances or equipment use a lot of energy in your home during the winter?
   b. What causes the high energy use?
      (1) Age of the appliance/equipment?
      (2) Condition?
      (3) Condition of home itself?
      (4) How you use it? Frequency of use?

C. Now let's talk about summer.

1. PROBES:
   a. What appliances or equipment use a lot of energy in your home during the winter?
   b. What causes the high energy use?
      (1) Age of the appliance/equipment?
      (2) Condition?
      (3) Condition of home itself?
      (4) How you use it? Frequency of use?

D. What are some of the things you've done to try to reduce the energy use in your home?

1. PROBE FOR: Changing behaviors? Physical improvements or upgrades? New appliances or electronics or other things that use energy?
   a. What do you think has worked for you in terms of reducing your energy use?
   b. What has not worked, or that you are not really sure if it worked?

III. HVAC *(40 minutes)*

Purpose: What do homeowners know about their HVAC, what service and/or maintenance experiences have they had.

A. Now let's talk specifically about your HVAC system. What do you know about your HVAC system?

1. PROBES (if not already mentioned):
   a. Age?
   b. Efficiency?
   c. Condition?
   d. Winter heating vs. summer cooling?

B. What do you think affects the efficiency of your HVAC system?

1. PROBES (if not already mentioned):
   a. Age?
   b. Cleanliness?
   c. Condition?
   d. Size?
   e. Ducting?
   f. Maintenance?
      1. What types of maintenance?
      2. How does that affect the HVAC system?
   g. Are there differences between winter heating vs. summer cooling?

C. What is your approach toward caring for your HVAC system? Do you do anything to it? (probe if maintenance or service contacts do not come up)

1. [IF YES] PROBES (for things mentioned):
   a. Is that a "one-time" thing or periodic and on-going?
   b. Why do you do that?
   c. How long have you been doing that?
   d. How did you learn about that or get started doing that? (What prompted you to start doing this?)
   e. (On-going) Why do you keep doing that?
   f. What does <u>your HVAC</u> get out of you doing that (e.g., save energy, longevity, works better, etc.)
   g. What do <u>you</u> get out of doing that? (lower bills, peace of mind, pride of ownership, etc.)
   h. Does that make a difference? How so?

2. [IF NO]:
   a. Why don't you do anything to it? What stops you?
   b. Do you have any concerns about not doing anything?
   c. Are you consciously not taking action, or just procrastinating?

D. What have been your past experiences with repairs for your HVAC system?

1. What happened or what did your HVAC need?
2. What did you do about it? (contractors will likely be mentioned)
3. Tell me about the experience …
   a. How did you choose the contractor?
      i. Did you know if the contractor was licensed? Did you know if the technician had training certifications?
   b. When the contractor came out, what did he/she tell you your HVAC needed? What did the contractor specifically do?
   c. Did the contractor conduct a thorough inspection of your HVAC at that time?
   d. Did the contractor recommend any additional work?
   e. Did you have this additional work done?
      i. Why?
      ii. Why not?
   f. Did the contractor offer you a service or maintenance agreement?
      i. IF YES: Did you sign up for it? Why or why not?
4. Was your experience overall positive or negative? How did it leave you feeling with regard to future work your AC might need?

E. What do you think about HVAC contractors? (some will have mentioned contractors already, but get all involved here)

1. Tell us about your experience with contractors in the past?
2. What are the positives about HVAC contractors? (DEVELOP LIST. THEN …)
3. [FOR POSITIVES MENTIONED]:
   a. Why is that a positive?
   b. Why does that matter to you?
   c. How did you get that perception?

4. What are the negatives about HVAC contractors? (DEVELOP LIST. THEN …)
5. [FOR NEGATIVES MENTIONED]
   a. Why is that a negative?
   b. Why does that matter to you?
   c. How did you get that perception?

6. [IF NOT MENTIONED]
   a. Do you think about the level of training they have?
   b. Size of the company?
   c. Years in business?
   d. The way they present themselves (clothes w company logo, car w company logo, etc)

IV. PG&E HVAC PROGRAM *(30 minutes)*

Purpose: describe the PG&E program and elicit reactions, understand what suggestions customers have for improvement.

A. Now I am going to describe a new program that PG&E is developing for residential customers. (PROVIDE HANDOUT WITH DESCRIPTION) **Please circle any items that are of interest to you and cross out that which is not interesting.**

PG&E is developing an enhanced Residential HVAC Quality Maintenance (QM) Program. This new program design would help customers and contractors to improve the efficiency of air conditioning systems in single-family homes, including duplexes and townhomes. The program is based on industry standards created by ACCA, the Air Conditioning Contractors of America.

Participating contractors and customers would get financial incentives to bring HVAC equipment up to at least a minimum level of the functional standard and maintained at that level. To qualify for this program, customers must first hire a contractor to "normalize" their HVAC units to the minimal level of the standard. Then, they will be incented to maintain their HVAC units through service agreements (likely 2 visits per year).

At the first visit, qualified, licensed contractors would complete an assessment and a customer report. The report includes recommendations and estimates for required energy efficiency treatments, covering airflow correction and refrigeration system service. It also would include listing of any remedial measures, such as fixing any safety and electrical issues, that must be done in order to be eligible for the rest of the program. Customers will be encouraged to sign up for a program-compliant on-going maintenance agreement.

PG&E will provide rebates for the required and optional treatments that would be paid to the contractor to offset some of the cost of these repairs. PG&E will also provide rebates for the service agreements that would be paid either directly to the contractor or to the customer to cover part of the cost of a maintenance agreement.

B. What do you think about this program?
1. Is it understandable and does it make sense to you?
2. What do you like about it?
3. What don't you like?
4. What would you gain from participating in such a program? What are the benefits?

C. Is this a program you would be interested in?
1. Why or why not?
2. What else would you want to know before signing up?
3. What do you think (if anything) would be the reason why you would participate in this program?

D. PG&E would cover part of the cost through rebates and the customer would pay part of the cost.
1. How much would you be willing to pay as your share for the initial visit and inspection, if anything?
   a. Give me an amount where you would definitely do this.

   b. Now give me an amount where it's just a bit too expensive so you would think about it but probably not do it.
2. [CUSTOMERS WITHOUT MAINTENANCE AGREEMENTS] How much would you be willing to pay as your share for an on-going annual maintenance agreement, which would include two-visits per year?
3. [CUSTOMERS WITH MAINTENANCE AGREEMENTS] How much do you currently pay for your service maintenance agreements?
   a. What do you get as part of the maintenance agreement? (PROBE FOR: number of visits, priority service, discounts on repairs, etc.)

4. What would you think if you had to sign up for both the normalization and service agreement incentives simultaneously. List both positives / negatives.

E. What would make this program more appealing to you, or easier for you to sign up?

F. How would you want this program to be promoted?
1. Directly from PG&E to customers?
2. Directly from contractors with assistance from PG&E?

G. What information do you think you would want before signing up?
1. PROBES: What do you want to know about the contractor?
2. What do you want to know about what the program does to your HVAC?
3. How important is it to get estimates of the amount of energy you could save?

H. What type (and level) of information would you want the contractor to document in the assessment? During the maintenance service agreement visits?

I. How would you feel if a 3rd party inspector would come to your home to verify that all the appropriate measures have been taken by the contractor? Would that make you more, the same, or less interested in participating? Why?
1. Should this service be done at your request only? Why or why not?

J. Should PG&E maintain (and manage) an approved contractor list or is a contractor's license enough?

K. What else does PG&E need to consider in order to be successful with its HVAC Quality Maintenance Program?

V. OTHER ISSUES *(5 MINUTES)*

A. (MODERATOR WILL GO TO THE BACKROOM FOR ANY FINAL QUESTIONS OR TOPICS) ARE THERE ANY OTHER ISSUES WE SHOULD COVER IN THE FOCUS GROUPS - ANY ADDITIONAL QUESTIONS??

VI. WRAP-UP *(5 MINUTES)*

A. Is there anything else you want to share about this topic?

B. Thank you for attending!

HVAC QUALITY MAINTENANCE (QM) QUANTITATIVE SURVEY

SAMPLING: PANEL SAMPLE OF RESIDENTIAL WITHIN SPECIFIED ZIP CODES

SCREENING:
(1) Homeowners
(2) Have central HVAC
(3) Single family homes, townhomes, duplexes
(4) Peak summer bill is over $200

Introduction

Thank you for participating in this survey. Your opinions are very important and will help guide energy policies in your area. Most people will complete the survey in 15 minutes or less. Your responses will remain confidential.

Screening

S1. To ensure we represent a variety of opinions, do you or have you ever worked in any of these businesses?

Advertising or public relations	1	OK
Agriculture	2	OK
Banking / insurance / financial services	3	OK
Building or architecture	4	OK
Business or professional services / consulting	5	OK
Construction / home improvement / contractor	6	OK
Education	7	OK
Environmental agency or government organization	8	OK
Entertainment	9	OK
City, County, State, or National government	10	OK
Healthcare	11	OK
High technology / computer programming	12	OK
Home improvement store / hardware store	13	OK
Hospitality / food services	14	OK
Manufacturing	15	OK
Market research	16	TERM
News companies (newspaper, TV, or radio station)	17	OK
Retail	18	OK
Retired	19	OK
Transportation / automotive	20	OK
Utilities such as electrical or gas power companies	21	TERM
None of these	22	OK

S2. Do you own or rent your home (or place you live)?

Own	1	OK
Rent	2	TERM
Don't know or not sure	9	TERM

S2a. What type of home do you live in?

Single-family detached home	1	OK
Attached home (shared walls) such as a duplex or townhouse	2	OK
In a multi-family building (units above or below) such as a condo	3	TERM
Mobile home	4	TERM
Something else (Specify: _____)	5	TERM
Don't know or not sure	9	TERM

S3. Which of the following does your home have? Check all that apply. (RANDOMIZE)

Ceiling fans	1	
Central Air Conditioning (AC or HVAC)	2	**MUST HAVE**
Portable air conditioner	3	
Room or window air conditioner(s)	4	
Swamp or evaporative cooler	5	
Whole house fan (sometimes called attic fan)	6	
None of these	7	
Don't know or not sure	9	

S4. Which of the following utility companies provides your home's electric and / or natural gas service? (Select all that apply).

Alameda Municipal Utility District	1	
Healdsburg Municipal Utility District	2	
PACIFIC GAS AND ELECTRIC COMPANY (PG&E)	3	**MUST HAVE**
Palo Alto Municipal Utility District	4	
Southern California Gas Company	5	
Sacramento Municipal Utility District (SMUD)	6	
Santa Clara Municipal Utility District	7	
Other _____	8	
Don't know or not sure	99	TERM

S5. Does PG&E provide you with…

Electric service only	1	
Gas service only	2	
Both electric and gas service	3	
Don't know or not sure	9	TERM

S6. How much is your <u>biggest</u> monthly electric bill in a typical summer?

Less than $100	1	TERM
$100 to $199	2	TERM
$200 to $299	3	
$300 or more	4	
Don't know or not sure	9	TERM

S7. Please enter your zip code. If you know your zip code plus the four digits that follow it, please enter the zip code + 4. [REQUIRE ZIP5, BUT ACCEPT ZIP5+4

__ __ __ __ __ - __ __ __ __

Section 1 (AC): AC Condition and Usage

In the next section, we are going to ask you questions about your central AC system.

AC1. DELETED

AC2. How would you evaluate the overall effectiveness of your central AC system in keeping you comfortable?

Excellent – it cools exceptionally well	1
Good – it works well, but not perfectly	2
Fair – it works, but struggles at times	3
Poor – it oftentimes does not keep up	4
Not sure	9

AC3. How would you evaluate the overall efficiency (that is, how well it converts electricity into cooling comfort) of your central AC system?

Excellent – it's as efficient as an AC could be	1
Good – it's efficient, but might need some "fine tuning"	2
Fair – it's okay, but could probably benefit from an overhaul or upgrade	3
Poor – it's an inefficient energy hog	4
Not sure	9

AC4. Why did you evaluate your central AC system's efficiency as [Excellent/Good/Fair/Poor]? That is, what is good about your system and/or what needs improvement?

_____

[ALL]
AC5. How interested are you in improving your central AC system?

Very interested	1
Somewhat interested	2
Not interested	3
Not sure	9

[IF AC5=1, 2, 9]
AC5a. What would you like to improve about your AC system? Select all that apply.

Energy efficiency	1
Indoor air quality (e.g., free of dust, allergens, etc.)	2
Comfort (e.g., improving cooling overall or in certain rooms)	3
Longevity (e.g., helping your system last longer)	4
Noise level while running	5
Reliability during hot weather	6
Something else (Specify: _____)	7
Nothing – no improvements are needed	8
Not sure	9

[IF TWO OR MORE ITEMS CHECKED FROM AC5a=1-7]

AC5b. Please rank-order the items by what you would like to improve most (where "1" is what you would like to improve the most).

[IF AC5a=1-7, 9]

AC6. How would you expect to benefit from the improvement(s) to your central AC you selected in the previous question?

_____

[IF AC5=2, 3, 9]

AC7. What is keeping you from being "very interested" in improving your central AC?

_____

[IF AC5=3]

AC8. How interested are you in <u>maintaining</u> the current performance of your central AC system?

Very interested	1
Somewhat interested	2
Not interested	3
Not sure	9

[ALL]

AC9. How old is your central AC system? If you are not sure, give your best estimate.

_____ years old	1
Not sure	9

AC10. Is your home's AC system one that you replaced or had installed, or was it already there when you bought the home?

I replaced an old AC system	1
I installed an AC system when the house did not have it before .	2
Already there when I bought the home	3
Not sure	9

AC11. Does your central AC have a programmable thermostat that can automatically control when the AC will run?

Has a programmable thermostat	1
Does not have a programmable thermostat	2
Not sure	9

AC12. DELETED

AC13. What percentage of summer days do you use your AC (i.e., it's on and runs at least part of the day)? If you are not sure, give your best estimate.

_____ summer days	1
Not sure	9

AC14. On the days that your AC is running, does it usually run...

12 hours or more	1
6 to 12 hours	2
Less than 6 hours	3
Not sure	9

AC15. DELETED

AC16. DELETED

AC17. When was the last time you or someone else changed or cleaned the filters for your central AC system?

Within the past month	1
Within the past 3 months	2
Within the past 6 months	3
Within the past year	4
1 to 2 years ago	5
3 to 5 years ago	6
More than 5 years ago	7
Never	8
Not sure	9

(IF AC17=1-4)

AC18. And how many times in the past year did you or someone else change the filters for your central AC system?

_____	1
Not sure	9

(IF AC17=1-7)

AC19. Where are your AC filters that you changed located?

At a return air vent or vents	1
On the AC unit itself (which might be on your roof, in your attic, or in a closet)	2
Both at the vent(s) and the unit itself	3
Not sure	9

AC20. Do you currently pay for a service where an AC contractor or technician periodically (every 6 months or once a year) cleans and/or inspects your central AC system?

Yes	1	AC26
No, but did have this service in the past	2	AC21
No, and never had this service	3	AC21
Not sure	9	AC21

(IF AC20=NO OR NOT SURE, ASK AC21 THROUGH AC25 THEN SKIP TO AC30)

AC21. How often, if ever, do you wash or clean the outside condenser of your AC system? The condenser is the box-shaped unit with a fan in the middle that is either in your yard or on your roof.

Never do this	1
Less than once a year	2

At least once a year or more often	3
Not sure.....	9

AC22. Do you do any maintenance yourself, or do you have a friend or relative do any maintenance on your central AC system (not counting changing filters or cleaning)?

Yes.....	1
No.....	2
Not sure.....	9

AC23. How many times have you paid for an AC contractor to perform a tune-up on your AC system?

Once	1
Twice.....	2
Three or more times.....	3
Never	4
Not sure.....	9

[IF AC23=1-3]

AC24. How much did you pay for the "tune-up" (the most recent time)? Your best guess is fine.

$_____	1
Not sure.....	9

AC25. How would you evaluate the value you received from this tune-up service?

Definitely worth the cost	1
Probably worth the cost but not really sure.....	2
Probably not worth the cost but might do it again anyway.....	3
Definitely not worth the cost and would not do it again	4
Not sure.....	9

[GO TO AC30 AFTER AC25]

(IF AC20=YES, ASK AC26-AC29)

AC26. How often does the AC contractor or technician clean and/or inspect your central AC system?

Less than once a year.....	1
Once a year.....	2
Twice a year.....	3
Three or more times a year	4
Not sure.....	9

AC27. During each service visit, which of the following does the AC contractor or technician perform? Select all that you are aware of. If you are not sure, leave it blank. RANDOMIZE

Inspects the controls and other electrical parts	1
Cleans the outside condenser and fan unit.....	2
Changes the filter(s).....	3
Operates the system in heating and cooling modes	4

Identifies parts before they fail and recommend replacement ... 5
Gives you advice or instructions about how to care for your AC system 6
Checks the air ducts for leaks 7
Checks the refrigerant amount..... 8
Something else not listed _____ 9
None of these 10
Don't know of anything that the AC contractor actually does..... 11

AC28. How much do you pay annually for this service to clean and/or inspect your central AC system? If you make more than one payment during the year, add up the payments. Don't count any other repair work you might have paid for.

$_____ per year 1
Not sure..... 9

AC29. How would you evaluate the value you receive from this service?

Definitely worth the cost 1
Probably worth the cost but not really sure..... 2
Probably not worth the cost but you do it anyway 3
Definitely not worth the cost and you plan to discontinue 4
Not sure..... 9

(ALL)

AC30. Which of the following best describes your beliefs about maintaining your central AC system?

Except for the filters, it doesn't need anything until it stops working 1
Regular maintenance (once a year or more often) is needed to keep it functioning properly..... 2
Occasional maintenance (once every 2 to 4 years) is needed to keep it functioning properly..... 3
Infrequent maintenance (once every 5 years or less often) is needed to keep it functioning properly..... 4
I don't really have any beliefs about what it needs 9

AC31. Other than tune-ups or routine maintenance visits, has your existing AC system needed any repairs? If you replaced an old AC system with a new one, base your answer only on the new one.

Yes..... 1
No..... 2
Not sure 9

[IF AC31=YES]

AC32. How much have you paid in total for repair work on your current AC system since you've owned it (not counting tune-ups or routine service visits)? Your best estimate is okay.

$_____ 1
Not sure..... 9

Section 2: (QM) HVAC QM Program Review

PG&E is working with the HVAC (Heating Ventilation and Air Conditioning) industry to develop a program that would encourage more residential customers to work with a participating HVAC contractor to ensure that their AC systems are operating at optimum efficiency.

Please read the following description of the program and answer the questions at the end of this section.

PG&E is developing a Residential HVAC Quality Maintenance (QM) Program. This new program would help customers and contractors to improve the efficiency of air conditioning systems in single-family homes, duplexes, townhomes, and 3-4 unit apartments.

The program includes 3 steps:

1. **Initial assessment – the customer would hire a licensed, participating contractor to complete an assessment of their central HVAC system and provide a detailed report with recommendations for making the ~~AC~~ system more efficient, covering airflow and ducting correction, refrigeration system service, new high-efficiency motors, and safety and electrical issues.**

2. **Repairs and improvements – the customer would hire a licensed, participating contractor to complete the repairs and/or upgrades identified in the assessment and based on program protocols.**

3. **Continuing service maintenance agreement – the customer would hire a licensed, participating contractor to conduct periodic (once or twice a year depending on the system) assessments and cleanings of their AC system to keep it running efficiently.**

The assessment and repairs will be done in accordance with the Air Conditioning Contractors of America (ACCA) Standards. The ACCA is a third party industry standard-setting association focused on HVAC systems.

Contractors will be screened and allowed to participate by PG&E. Qualification will require proof of license, insurance, and training to meet ACCA Standards. PG&E will maintain a list of participating contractors on the PG&E program website.

PG&E will provide rebates to cover up to half of the cost for (1) the initial assessment, (2) the repairs and improvements, and (3) the on-going service maintenance agreement.

If a customer already has an AC contractor they want to work with, the contractor would need to take the necessary steps to become a participating contractor in order to be eligible to provide the program offerings.

QM1. Based on this description of the HVAC QM program, how interested are you in a program like this? Please rate your interest on a 10-point scale where 10 means you are definitely interested, a 5 means you are indifferent or unsure, and a 1 means you are definitely not interested.

10 Definitely Interested	10
9.....	9
8.....	8
7.....	7
6.....	6
5 Indifferent or Unsure	5
4.....	4
3.....	3
2.....	2
1 Definitely Not Interested	1
Don't know or can't answer	99

QM2. What do you like best about this HVAC QM program? Please be as specific as possible.

_____(Open end)

QM3. What don't you like about this HVAC QM program? Please be as specific as possible.

_____(Open end)

QM4. Based on what was described about this new HVAC QM program, which of the following would you have concerns about? Please indicate whether each is a major concern, minor concern, or no concern at all regarding this new program. A concern means it is something you might think is a negative or that could be a reason not to participate in the program. You may only choose up to 3 major concerns. RANDOMIZE

a. Having a participating AC contractor conduct the initial assessment of your central AC system
b. Finding the right AC contractor that is licensed and reputable
c. Keeping the AC improvements within your budget or so they are affordable to you
d. Getting a large enough rebate compared to the total cost
e. Getting financing to pay for the improvements
f. Achieving enough energy savings to justify the cost of the AC improvements
g. Having the program sponsored by PG&E
h. The contractor recommends which improvements you should make (e.g., you wouldn't trust that all the recommended improvements are needed)
i. In order to qualify for the rebate, you must make all the improvements that are recommended by the contractor
j. You need few, if any, improvements. Your central AC is already energy efficient.
k. Your AC system is old, so it might cost too much to improve or is not worth improving

Major concern	3
Minor concern.....	2
Not a concern at all	1
Not sure.....	9

QM5. What are the positives about the program? You may only choose up to 3 major positives. RANDOMIZE

a. Assessments and repairs will be done in accordance with the ACCA Standard 4, which is an industry "best practices" guideline
b. The program is sponsored by PG&E
c. Participating contractors will be screened by PG&E
d. Having a participating AC contractor conduct the initial inspection of your central AC system
e. The participating contractor recommends which improvements you should make
f. The program can make AC improvements more affordable
g. It gives me options and ways to customize my participation.

Major positive	3
Minor positive	2
Not a positive	1
Not sure.....	9

Section 3 (CT): Choice Tasks (conjoint)

The HVAC QM program has several different features from which you can choose different options. Please carefully read about the features below and then select the option you prefer most.

CT1a. Assessor. There are two different types of assessors from which you could choose. Which do you prefer?
- e. Assessor who only does assessments – you would need to choose another participating AC contractor to complete the recommended repairs or improvements
- f. Assessor can do both the assessment and any recommended repairs or improvements

CT1b. Choice for On-Going Service Maintenance Agreements. There are four choice options of service maintenance agreements from which you could choose. Which do you prefer?
- a. Mandatory for 3 years
- b. Mandatory for 2 years
- c. Mandatory for 1 year
- d. Optional

CT1c. Frequency for On-Going Service Maintenance Agreements. There are two frequency levels of service maintenance agreements from which you could choose. Which do you prefer?
- a. Maintenance service visits are once a year (e.g., before summer)
- b. Maintenance service visits are twice a year (e.g., before summer, before winter)

CT1d. Rebate Payment. There are two rebate payment options from which you could choose. Which do you prefer?
- a. Rebate is paid directly to the contractor so the customer pays the contractor the balance (total minus the rebate) at the time of service
- b. Rebate is paid to the customer, so the customer pays the contractor the full amount at the time of service and receives the rebate in the mail from PG&E

CT1e. Initial visit cost. What do you think is a fair and reasonable cost for the initial AC assessment, where you would probably sign up for this?

$_____(one time initial visit cost)

CT1f. Annual maintenance agreement cost. What do you think is a fair and reasonable cost for the annual maintenance agreement, where you would probably sign up for this?

$_____(annual cost)

CT1g. Repair and improvement costs. What is the maximum you would pay for any recommended repairs and improvements to your AC system?

$_____ (maximum repair and improvement cost)

CT1h1. How rebate is computed. PG&E is considering two different methods for computing the incentive amounts for this new AC program: (1) fixed dollar amounts or (2) a percentage of the cost to the customer. In total, the amount of incentives that PG&E will pay out will be the same. With fixed dollar amounts (e.g., $100), the customer

would know in advance exactly how much the incentive would be and each customer would receive the same amount for each step of the process. With a percentage of the cost to the customer (e.g., 25%), the amount of the incentive would depend on the actual cost of each step, so a customer who works with a contractor who charges less or whose AC system needed fewer improvements would receive a smaller incentive that a customer whose contractor charges more or whose AC system needed more improvements. Which method do you prefer?

a. Rebate is computed in dollars
b. Rebate is computed in percentages

CT1h2. Why do you prefer this method?

CT2. Conjoint choice tasks to test or assess:

Now we'd like to show you some different versions of the HVAC QM program. Please read each one carefully and then select the version that you prefer the most. There are X of these questions for you to answer.

Which one of these HVAC QM programs would you choose if you were offered these specific versions of the program? Please pick one by clicking on the button below the one that you would choose.

The "costs" are the amount you would pay "out-of-pocket" after receiving the rebate.

THREE OPTIONS REVIEWED AT A TIME. "WOULD NOT PARTICIPATE IF THESE ARE THE OPTIONS" CHOICE FOLLOWING EACH COMPARISON CHOICE.

CHOICES CONSTRUCTED FROM:

11) Assessor
    a. Assessor who only does assessments (does not perform QM or repair services)
    b. Assessor can do the assessment, QM services, and any necessary repairs

2) Length of Service Maintenance Agreements
    a. Mandatory for 3 years
    b. Mandatory for 2 years
    c. Mandatory for 1 year
    d. Optional

3) Frequency of Service Maintenance Agreements
    a. Maintenance service visits are once a year
    b. Maintenance service visits are twice a year

4) Rebate Payment
    a. Rebate paid directly to the contractor
    b. Rebate paid to the customer

5) Cost of the Initial Visit
    a. $50
    b. $100
    c. $150
    d. $200

6) Rebate on Initial Visit
    a. $0
    b. $25
    c. $50
    d. $75
    e. $100

CALCULATED "NET COST" OF INITIAL VISIT (5 minus 6)
CONSTRAIN SO REBATE NEVER GREATER THAN COST

7) Costs of Repairs or Improvements

a. No repairs needed
b. $200
c. $400
d. $600
e. $800

8) Rebate on Repairs or Improvements
   a. $0
   b. $100
   c. $200
   d. $300
   e. $400

CALCULATED "NET COST" OF REPAIRS OR IMPROVEMENTS (7 minus 8)
CONSTRAIN SO REBATE NEVER GREATER THAN COST

9) Annual Cost of Service Maintenance Agreement
   a. $50
   b. $100
   c. $150
   d. $200

10) Rebate on Service Maintenance Agreement
   a. $0
   b. $25
   c. $50
   d. $75
   e. $100

CALCULATED "NET COST" OF ANNUAL SERVICE MAINTENANCE (9 minus 10)
CONSTRAIN SO REBATE NEVER GREATER THAN COST

HOLDOUT TASKS THAT ALL RESPONDENTS WILL SEE AND EVALUATE

OPTION 1 ("HIGH" OPTION):

Assessor:	Does assessments only
Choice of Service Maintenance Agreement:	Optional
Frequency of Service Maintenance Agreements:	2 times per year
Rebate payment goes to:	Customer
Cost of the initial visit:	$100
Rebate on initial visit:	$50
Cost of repairs or improvements:	$200
Rebate on repairs or improvements:	$100
Annual cost of service maintenance:	$100
Rebate on service maintenance:	$50

OPTION 2 ("LOW" OPTION):

Assessor:	Can do both assessments and repair
Choice of Service Maintenance Agreement:	Mandatory for 1 year
Frequency of Service Maintenance Agreements:	2 times per year
Rebate payment goes to:	Contractor
Cost of the initial visit:	$150

Rebate on initial visit:	$50
Cost of repairs or improvements:	$600
Rebate on repairs or improvements:	$200
Annual cost of service maintenance:	$150
Rebate on service maintenance:	$75

CT3. Please consider how important different benefits are when choosing to participate in a HVAC QM program. Considering only these 3 benefits, which is the Most Important and which is the Least Important to you when deciding to participate in the above HVAC program?

USE BEST/WORST MAXDIFF SCALING. INCLUDE 3 ATTRIBUTES AT A TIME, 6 TASKS IN TOTAL.

1. Improves the physical comfort of your home
2. Saves money on your PG&E bill
3. Saves energy
4. Good for the environment / the planet
5. Increases the life of your central AC system
6. Improves the air quality of your home

Section 4 (IS): Information Sources

IS1. There are different ways that people can learn about an HVAC energy efficiency improvement program. If you were planning to improve your system, which of the following sources of information would be useful to you in making your decision? Select up to three. RANDOMIZE

Direct mail from AC contractors	1
Flyers or brochures from AC contractors left at your door	2
Direct mail from PG&E	3
Bill inserts from PG&E	4
An Internet website about AC systems created by PG&E	5
Internet searches (e.g., using Google)	6
Email from PG&E	7
Word-of-mouth	8
Contact by an AC contractor you currently know	9
None of these	99

IS2. a. Which of the following sources would you consider using to find an AC contractor for a program like HVAC QM? Select all that apply.
b. Which one you would be most likely to use?

RANDOMIZE

From the phone book or online yellow pages listing	1
From an ad (such as in the newspaper or on the radio)	2
Get a referral from someone you know	3
Use a contractor you have worked with before	4
Get a referral from a list of participating contractors on PG&E's website	5
Get a referral from a list of participating contractors on the ACCA's website	6
Internet / online search (e.g., Google search)	7
From a ratings website like YELP	8
Some other way (_____)	9
Don't know or not sure	10

SECTION 5 (D): DEMOGRAPHICS

The remaining questions help us ensure we include the opinions of all types of people.

D1. Are you …

Male	1
Female	2

D2. In which age group are you?

18-24	1
25-34	2
35-44	3
45-54	4
55-64	5
65-74	6
75 or older	7
Prefer not to state	9

D3. What is the highest level of education you have completed?

Some high school or less	1
High school graduate	2
Some college	3
2-year or technical school graduate	4
College graduate	5
Masters or doctorate degree	6
Prefer not to state	9

D4a. In addition to yourself, who else lives in your home? (Select all that apply).

Spouse/Significant Other	1
Children	2
Parent(s)	3
Other relatives	4
Roommates	5
No one else	6
Prefer not to state	9

D4b. How many people in total live in your home including yourself?

_____	
Prefer not to state	99

D5. Which of the following best describes your ethnic background?

White or Caucasian	1
Hispanic or Latino	2
African-American	3
Asian or Pacific Islander	4
Native American	5
Mixed background	6

Some other background _____	7
Prefer not to state	9

D6. What is your annual household income before taxes?

Less than $15,000	1
$15,000 to less than $30,000	2
$30,000 to less than $50,000	3
$50,000 to less than $75,000	4
$75,000 to less than $100,000	5
$100,000 to less than $150,000	6
$150,000 to less than $200,000	7
$200,000 or more	8
Don't know	9
Prefer not to state	10

D7. In what year was your home built? Your best estimate is okay.

_____

Don't know or prefer not to state 9999

D8. How many square feet is your home? Your best estimate is okay.

_____

Don't know or prefer not to state 9999

D9. What is the approximate value of your home?

Less than $100,000	1
$100,000 to less than $200,000	2
$200,000 to less than $300,000	3
$300,000 to less than $500,000	4
$500,000 to less than $700,000	5
$700,000 to less than $1,000,000	6
$1,000,000 to less than $1,500,000	7
$1,500,000 to less than $2,000,000	8
$2,000,000 or more	9
Don't know	10
Prefer not to state	11

D10a. How long have you lived in your current home?

Less than 1 year	1
1-3 years	2
4-6 years	3
7-10 years	4
11-15 years	5
16-20 years	6
21-30 years	7
31 or more years	8
Prefer not to state	9

D10b. How many more years do you intend to stay in your current home? Your best estimate is fine.

Less than 1 year	1
1-3 years	2
4-6 years	3
7-10 years	4
11-15 years	5
16-20 years	6
21-30 years	7
31 or more years	8
Don't know/Unsure	9

D11a. How would you describe the overall energy efficiency of your home?

Excellent	1
Very good	2
Good	3
Fair	4
Poor	5
Very poor	6
Don't know	9999

D11b. Which of the following, if any, does your home have? (Select all that apply.)

a. Gas central heating
b. Electric central heating
c. Double or triple paned windows
d. Solar water heating
e. Solar electricity panels
f. Swimming pool and/or spa (do not count a community pool or a portable pool)
g. Whole house fan
h. Attic insulation that meets current standards
i. Wall insulation that meets current standards
j. None of these

NOTE: D11a AND D11b COULD BE MOVED TO END OF SECTION AC

D12. Approximately what is the total of your average monthly <u>summer</u> electricity and natural gas bill(s)?

_____
Don't know 9999

D13. Approximately what is the total of your average monthly <u>winter</u> electricity and natural gas bill(s)?

_____
Don't know 9999

D14. In which of the following utility-sponsored programs have you participated before? (Select all that apply).

Appliance recycling	1
Balanced or level bill payment plan	2

California Solar Initiative or other solar rebate program 3
CARE 4
ClimateSmart 5
Energy Upgrade California (Whole House program) 6
Energy Partners, which provides energy efficiency assistance at no cost (weatherization and new appliances) for income qualified customers 8
FERA 9
Home energy audit or survey 10
Rebates for energy efficient appliances, insulation, etc. 11
SmartAC (air conditioning cycling or shut off program) 12
SmartRate (or time-of-use or TOU rate, where you pay a different amount at different times of day) 13
Others (_____) 14
Don't know 98
None of these 99

PC1. We just have two last questions for you. First, how much did you enjoy taking this survey?

I enjoyed it a lot 1
I enjoyed it a little 2
I felt neutral about it 3
I disliked it a little 4
I disliked it a lot 5

PC2. Finally, please let us know what you thought about this survey and the topics discussed.

TEXT BOX FOR COMMENTS

On behalf of the California Public Utilities Commission and Pacific Gas & Electric Company, we would like to thank you for your time and help with this important survey. Your answers will help guide energy policy within California.

Click the ">>" button to submit your answers.