

# **SUPER GOOD CENTS: A COMPREHENSIVE APPROACH FOR CAPTURING LOST OPPORTUNITIES IN NEW RESIDENTIAL CONSTRUCTION**

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In 1984, the Bonneville Power Administration established the Super Good Cents (SGC) Program to promote the construction of energy-efficient electrically heated residences. Bonneville's program, based on the nationally recognized Good Cents Program of Southern Electric International, incorporates the Model Conservation Standards (MCS) of the Northwest Power Planning Council.

Designed to encourage and sustain energy efficient building practices through market demand, the program also offers training and financial incentives for utilities and builders. The primary goals of the program include consumer and builder acceptance and changes in building practices, as well as developing support for the implementation of the MCS in state and local building codes.

To understand how this broad marketing and training effort operated to meet its objectives, the evaluation investigated various program elements and their interrelationships. The results of the comprehensive process evaluation cover five years of program implementation and refinement, and include key outcomes such as utility participation, program penetration, operating costs, and consumer and builder attitudes and actions. The program has achieved a high level of utility participation, with 113 public and investor-owned utilities offering it to their customers.

Although over 6,200 SGC housing units have been built, regional penetration is below the target of 60%. This is particularly a problem with larger utilities. The program has successfully increased the regional capability to achieve energy-efficient new construction. However, it is also costly and compliance issues leave a degree of uncertainty about the acquired resource. The evaluation has provided a number of recommendations to enhance program operation.

## **BACKGROUND AND PROGRAM DEVELOPMENT**

In 1980, passage of the Pacific Northwest Electric Power Planning and Conservation Act created the Northwest Power Planning Council. Under the mandate of the law, the Council established the Model Conservation Standards (MCS) in 1983 for energy efficiency in electrically heated buildings.

In 1984, the Bonneville Power Administration instituted the Super Good Cents Program (SGC) to help promote the MCS to home buyers and the shelter industry. Bonneville based their program on the already developed Good Cents program of

Southern Electric International (SEI). Super Good Cents is a marketing program in which participating utilities review building plans, inspect homes during construction and certify qualifying homes. Bonneville supports the program with technical materials, training and a regionwide advertising program to promote consumer awareness and interest in purchasing a SGC home. Bonneville funds are also provided to support local advertising and make incentive payments to builders or buyers of certified homes. The program allows builders considerable

flexibility in meeting the MCS standards. There are four methods and a multitude of options and techniques within each method to qualify homes.

Primary goals for the SGC program include: (1) increasing consumer awareness, acceptance and demand for new homes built to the MCS; (2) increasing builder understanding and acceptance of the MCS; (3) moving building practices closer to the MCS; and (4) developing support for the implementation of the MCS in local and state building codes. The program is operated by both public and investor-owned utilities. By the end of 1988, 113 utilities were operating the program in Bonneville's four-state service territory (Washington, Oregon, Idaho and western Montana).

## EVALUATION OVERVIEW AND METHODS

The SGC program is a complex broad-scale marketing effort involving the interdependent action of thousands of participants and scores of independent organizations. A cooperative effort by utility and Bonneville staff, builders, advertising agencies and organizations providing training in marketing and construction techniques was established to influence consumer behavior. The evaluation addressed the complexity of the program by looking at the activities of these groups, the decision processes of consumers and naturally occurring market forces.

The objective of the evaluation was to provide feedback for program management by gathering information from participants, documenting the history of the program, explaining the causation of program results, determining the program's strengths and weaknesses, and making recommendations for program improvements. This was primarily a process evaluation which analyzed program operation and investigated program results. These results included the number of SGC homes constructed; penetration rates over time for the region and within utilities; program operating costs to Bonneville and the region; and changes in consumer and builder attitudes and actions.

The evaluation covers the four years of program operation through December 1988. The study did not look at energy performance or the resulting

energy savings of SGC homes. That analysis is being conducted in a separate study due to be completed in December 1990.

The primary research methods of the evaluation include consumer surveys, builder surveys, a survey of SGC home owners, data collection on housing starts and certification, in-depth interviews with utility and program management staff, and an analysis of the costs of the SGC program. The surveys and data collection occurred repeatedly over the three years of the evaluation to help monitor change over time and provide feedback to the program manager. All survey samples, except the SGC Occupant Survey, were drawn randomly from the combined territory of participating SGC utilities. Table 1 shows the dates, sample sizes and error margins of the surveys. In-depth interviews were conducted with Bonneville, utility and contractor staff semi-annually to obtain the perspective of program implementers.

This paper addresses the components of the evaluation, including: (1) market penetration; (2) utility participation; (3) builder attitudes and practices; (4) consumer attitudes; (5) program management and marketing and training support; and (6) program costs.

## EVALUATION COMPONENTS

### Program Participation and Penetration

One of the most important measures of success of the Super Good Cents program is the number of homes built and certified under the program

*Table 1. Sample Survey Sizes*

Survey	Date	N	Error Margin
Baseline Consumer	11/85	1169	+3%
Baseline Builder	2/86	319	+5%
Second Consumer	8/86	402	+5%
Second Builder	2/87	320	+5%
Third Consumer	11/87	616	+4%
SGC Occupants	1/88	356	+3.5%
Third Builder	3/88	395	+5%
Fourth Consumer	11/88	781	+3.5%

specifications. Perhaps more important, however, is the relative proportion (market penetration) of new electrically-heated homes and apartments built as SGC homes. Bonneville established escalating penetration targets for the program over the past six years, increasing from 4% in 1985 to 40% in 1988 and ultimately to 60% in 1990.

One of the difficulties in tracking program penetration is the need for timely recording of completed SGC homes and tracking all new construction. Utility hook-up records were used for this analysis to identify new construction in each utility territory. A number of difficulties resulted from this approach. First, many of the utilities had not developed data recording and tracking systems capable of distinguishing new residential construction from other types of new residential accounts such as shop or barn hook-ups or changes in existing accounts. Participating utilities were eventually able to record this information; many used a "hook-up" card developed for the evaluation that also recorded the characteristics of the homes.

The second difficulty resulted from the time difference between new hook-ups occurring at the beginning of construction and completion of the SGC homes. Matching the two for an instantaneous penetration analysis was not possible. Instead, a rolling penetration of the prior year was estimated.

An unplanned benefit of tracking new hook-ups, as requested by the evaluators, was that utilities identified new homes early in the construction process. These became important leads for utility representatives to contact about the program.

Although the absolute number of certified homes has approximately doubled every year, resulting in 6,226 units by the end of 1988, penetration has not kept the same pace. After nearly meeting the targets in 1986 and 1987, penetration in 1988 failed to achieve the 40% target. This is largely due to the addition that year of several large investor-owned utilities to the program, dramatically expanding the population base because they serve many of the areas of greatest new construction activity during this period. However, even among utilities with three or more years of operation, the average penetration was only about 26% of all electrically-heated new homes.

The 1988 data reveals two important facts. First, many utilities achieved a penetration rate over 40%, demonstrating that considerable improvements in market share are possible. Second, the rate of growth of the more mature utility programs has leveled off, indicating that penetration levels will not increase as rapidly in the future.

### Utilities

Bonneville has maintained from the beginning that the SGC program should be operated by the utilities with as little direct involvement by the agency as possible. Bonneville took the lead in developing the program, providing financial support and taking responsibility for regional training and advertising, while the utilities are responsible for local implementation. Therefore, evaluation of utility implementation of the SGC program relied on periodic interviews with key utility personnel, including program managers, and, in the case of the larger utilities, the technical and marketing staff. Information was also available from Bonneville's own monitoring visits to the utilities. In addition, utility participation and training attendance were tracked.

By the end of 1988, nearly all of the eligible utilities (88%) were participating in the program. The number of utilities participating has increased each year from 22 (1984) to 113 (1988). The 113 participating utilities served 73% of the customers of all eligible utilities in 1988, up significantly from 34% in 1987. Again, this is mostly a function of the large investor-owned utilities signing up in 1988.

A major issue with utility implementation is the application of a uniform program design across a range of utility sizes and situations. In general, it was found that the amount of staff time required for program activities in small utilities or areas of low residential growth was larger. As a result, Bonneville made subsequent efforts to accommodate the smaller utilities.

Utility effort and commitment to the program, as gauged by both staff and management support, have been good. Many smaller utilities had staffing problems--often, a single staff member was responsible for many different conservation programs. Also, over half of the utilities had less

than a full time employee allocated to the program. In cases where the new housing market was small, this was not a problem. Only the larger utilities had more than one person working on the program, and one had more than 20 FTE staff assigned to the program.

Quality control and compliance with program specifications are critical responsibilities of the utilities. Although compliance assessment was not part of this evaluation, these procedures were reviewed. Compliance is monitored continually in the construction process through periodic inspections by utility staff. Two potential problems were anticipated, though few actual cases have been identified. The first concerned possible failure to reassess construction changes to determine whether a home meets the energy use targets. The second was improper construction techniques or installation of equipment other than specified.

Although utilities are responsible for compliance under the program, by 1988 Bonneville began to establish its own monitoring effort through an independent contractor to ensure that it was getting the conservation resource it was paying for, and to protect the credibility of the program if quality was not maintained.

Training is a critical factor in insuring utility understanding and effective implementation of the program, including compliance. A total of 294 utility representatives from every participating utility have attended the introductory training. Many of these went on to advanced training. Specific inspection training for utility representatives did not begin until late 1988. In addition to the formal training, utility roundtables are held in which representatives from neighboring utilities receive information on special topics and, more importantly, share problems and solutions. It was found that the roundtables contributed to a greater degree of program coordination and utility involvement.

### Builders

The evaluation of the relationship of the shelter industry to the program consisted of annual telephone surveys of active "professional" builders working in territories served by participating utilities. The surveys were designed to measure

changes in awareness and attitudes about the program and in building practices related to energy efficiency. Owner-builders and subcontractors were screened out. The number of SGC builders included in the first two surveys of random samples of builders was low because there were so few of them. However, in 1988, the sample of builders was stratified to ensure that 100 SGC builders were surveyed to obtain information on this important population.

One of the difficulties in the builder analysis was identifying active builders. In Oregon and Washington, registration lists compiled by the state Departments of Commerce were used. However, these lists contained many subcontractors that had to be screened out early in the survey process. Montana and Idaho do not require builders to be licensed, so membership lists from state home builders associations were used. In reviewing training and SGC building records, we also found that builders recorded their company names in some cases used only their own names in others. As a result, duplicates had to be screened out.

Along with the rising volume of SGC homes, the number of builders who have built SGC homes increased. By the end of 1988, nearly 1,400 builders (over 1,100 professional builders and about 260 owner-builders) had built at least one SGC home, a 29% increase over 1987. Early in the program there was a proportionally large increase in those building a SGC home for the first time, from 78 in 1985 to 383 in 1986. Less dramatic increases have occurred since then. More significantly, however, there has been a low repeat rate among builders. About two-thirds of the professional builders have built only one SGC home, about 30% have built between two and nine, while very few have built more than ten SGC homes. As a result, the evaluation recommended targeting participation by volume builders as a key strategy for increasing overall program penetration.

Another important measure of builder participation is attendance at program training. A total of 4,292 members of the shelter industry have attended builder training. Excluding non-builders, we estimate that about 12% of the builders in the region took part in training. About two-thirds went on to advanced training. From a peak attendance of

1,585 builders in 1985, introductory trainees declined to 857 in 1988. Attendance per session has also declined. More importantly, it was found that less than half of the builders who built an SGC home attended SGC training. Combined with the fact that many trained builders have only built one SGC home, this led to recommendations that the program increase its effort to recruit and train volume builders and to encourage trained builders to construct more SGC homes.

As a test of program diffusion, builders were asked about their awareness of the program. Currently, there is a high degree of awareness, jumping dramatically from 48% in 1986 to 79% in 1987, and then leveling off in 1988. The main sources of program awareness were the local utility, television and other builders.

Awareness of the program does not necessarily translate into familiarity with the Model Conservation Standards (MCS) on which it is based--an important step toward the program's meta-goal of building support for the MCS. In 1988, only about 17% of the builders were "very familiar" with the MCS. Even among SGC builders, only about one-third said they were very familiar with the MCS, apparently indicating that builders are not equating MCS and SGC standards.

The surveys found support for energy efficiency among builders. In the 1986 and 1987 surveys, just under half of the builders felt energy efficiency was very important to consumers when purchasing a new home. Support for energy efficiency standards was also found to be relatively high among builders. In fact, in both the 1987 and 1988 surveys, over half of the builders supported codes set at MCS/SGC levels.

Incentives were found to be less critical to participation in the program than other factors. This is based on the finding that only 14% of the SGC builders surveyed in 1988 said the incentive was the main reason they participated. In fact, less than half of the SGC builders said that the incentives had a lot of influence on their decision to participate.

The surveys also attempted to track changes in building practices over time. SGC builders were compared with non-SGC builders. A caution here is that the responses were self-reported and reflect

builder estimates of their "typical" practice. Nonetheless, for each of the major components (walls, ceilings, floors and windows) SGC builders were found typically to build their average home to a higher standard. For example, 73% of the SGC builders build R-38 or better ceilings in their homes, while about 52% of non-SGC builders do so. As for walls and windows, there were only minor differences found in 1988 as compared to more dramatic differences in 1987, leading to the conclusion that wall and window practices have improved more rapidly among the non-SGC builders. While much of this change is the result of changes in building codes in Oregon and Washington (also reflecting the measure levels recommended by the MCS), it is clear the SGC program has aided in the transition through training and demonstration.

#### Consumers

As with builders, the primary vehicle for the consumer analysis was a telephone survey. Following a baseline survey in 1985, annual surveys were conducted to track changes in awareness and attitudes toward the program and energy efficiency in general among home buyers. In addition, 356 owners of SGC homes were surveyed early in 1988.

The only difficulty with the consumer component of the evaluation was the identification of potential home buyers for the general consumer surveys in the territories of participating utilities. Since customer lists from the utilities were not available, random telephone numbers were generated from known prefixes. This produced many phone numbers that were not in use, particularly in rural areas. In addition, because not all households plan to buy a new home, a screener question was required in the survey. The screener indicated that about 44% of all households were potential home buyers and therefore targets for program promotion.

As with program penetration, Bonneville established awareness targets among potential home buyers that increased each year from 20% in 1985 to 65% in 1988. The consumer surveys found that these targets were met or exceeded each year through 1987. Awareness fell short of the target in 1988, when a

large influx of potential home buyers was added to the active program territory as a result of investor-owned utility participation. Excluding this segment, awareness levels were about 75% in 1988. Television advertising was the primary source of awareness, followed by newspaper advertising.

A clear majority of consumers over the years have felt that energy efficiency is very important when considering a new home. However, in open-ended questions it was not found to be among the major criteria used in home selection. Yet when specifically mentioned in a list of options, energy efficiency was the top choice. No significant change in this response was observed over the years. Furthermore, potential home buyers indicated a willingness to pay more for an energy efficient home. Thus, it can be concluded from these findings that energy efficiency is an important but secondary consideration in choosing a new home. As a result, there does not appear to be a strong primary demand for energy efficiency in new homes. Interestingly, the survey results indicate that among actual SGC home buyers, saving energy and money (i.e., reduced utility bills) were the primary reasons for choosing their homes.

Several important uses of the evaluation surveys in program implementation have been the identification of key market segments to target with promotions, testing the effectiveness of advertising, and providing feedback to the program manager. Following the first survey, program marketing shifted from a general awareness approach to a more targeted effort based on home buyer demographics. The annual surveys allowed periodic feedback and adjustments as necessary.

Other findings from the surveys that were helpful in program planning were fuel choice preferences and market potential analyses (a test of consumer awareness of incentives). From the SGC Occupant Survey, information was obtained on how home buyers actually interacted with the program and what their decision-making criteria were. Their level of satisfaction with the SGC home was also gauged. In addition, details on the characteristics of SGC homes were obtained.

### Program Management and Support

The process evaluation investigated the development and operation of the program from the perspective of Bonneville's central program management and Area Office staff, and the program delivery staff at the utilities. Formal interviews were initially conducted, followed by ongoing contact from the evaluators throughout the duration of the evaluation to assess program and personnel changes. As a result, the evaluation served as a form of program memory that was particularly useful to new staff. In addition, the evaluation was formative in its approach, providing ongoing feedback for program operation. The evaluation also provided information for Bonneville to convey to the Northwest Power Planning Council for its overall conservation program assessments.

The Super Good Cents program is a large and complex program operating on a number of levels, including marketing and promotion, training, technical assistance and monitoring. Each of these components is critical to the overall success of the program. It was necessary for Bonneville to rely on outside contractors and several state offices for most of these services. The process evaluation reviewed their procedures and products and interviewed key personnel in each area. Evaluation findings were used both formally and informally in refining these activities. Some examples are presented below.

- Survey findings provided input to the design and placement of program advertising.
- The evaluation indicated that many small utilities needed more hands-on assistance in setting up their programs and solving localized problems. Bonneville subsequently established a "Smart Team" of consultants who visited utilities and provided both administrative and marketing assistance.
- The evaluation also identified potential compliance problems. In 1988, an independent contractor was hired to conduct site visits and compliance reviews. Special training on inspections was also added for the utilities.

The states were primarily responsible for technical assistance. In 1988, financing was added as an area for technical assistance after it was identified as a potential barrier to construction of SGC homes. The states began working with lenders and appraisers. An important spin-off activity involved working with HUD and FHA offices to revise their load review procedures and criteria.

### Program Costs

The evaluation looked at costs from two perspectives: (1) the costs to Bonneville and the utilities for staff and expenses in operating the program; and (2) the extra cost to the builder (and home buyer) of building a SGC home compared to a conventional home.

The evaluation identified about \$20.3 million in expenditures for the program from the beginning of the program through the end of Fiscal Year 1988. This translates to \$3,260 per certified home, with the cost per home dropping each year as program setup costs are amortized. The single largest category of expenditures, representing nearly half of the total, was utility contract payments covering administrative expenses, some advertising and the financial incentives. Incentives alone represented about 20% of total expenditures. The second largest expense category was training and technical assistance, at just over a quarter of the total. This was followed by regional advertising and promotions, representing about a quarter of total expenditures. However, if regional and utility-specific advertising costs are combined, they represent one-third of total expenditures.

Several difficulties arose in reviewing program expenditures. First, Bonneville had no clear accounting system for its own internal operations expenses such as staff labor, equipment, travel, etc. Second, early program costs were not broken out into clear categories. Third, some costs were reported in calendar years, while most were in federal Fiscal Years, making it difficult to match to program operational goals.

In a separate study conducted for Bonneville, a regionally stratified sample of SGC builders was asked to estimate costs for constructing three different prototype SGC homes and their equivalent

"current practice" homes. The builders were also asked to provide costs for a SGC home they had recently completed. This study involved extensive participation by a technical committee and a builder consultant from each state to verify the reasonableness of reported costs.

The study found that SGC builders report that SGC homes cost more to build than current practice homes. Regionwide, the mean difference was found to be about \$1,350. In addition, there was an additional administrative cost of about \$200 to builders for the certification process. Thus, the total incremental cost of building a SGC home was about \$1,550, or roughly 1% to 3% of the house sale price. Interestingly, a number of builders reported minimal or no cost differences, indicating that they are already at or near MCS levels in their current practice. Bonneville's incentives to the builder ranged from \$1,000 to \$1,500 during the same time period.

### CONCLUSION

After four years of operation, the SGC program is an integrated marketing effort that has achieved a number of successes. It has:

- Increased regional capability to provide energy-efficient new construction.
- Raised regionwide awareness of both energy efficiency and SGC homes.
- Achieved a high level of participation among utilities.
- Created over 6,200 SGC housing units and saved the energy that would have been lost had these been built to current practice.
- Trained builders and utilities all over the region.
- Familiarized builders and utilities with the MCS.
- Developed support for setting residential building codes at the MCS level. This contributed to code improvements to near-MCS recommended levels in Oregon and Washington.
- Used the evaluation as a useful method for providing feedback to program managers. Recommendations for program improvement were considered and often implemented.

The evaluation also revealed some program weaknesses. There has been a leveling off in the rate of growth in SGC housing starts of utilities with more mature programs, indicating that penetration levels will not increase as rapidly in the future. Scarce staff time and training resources were spent inefficiently, assisting a large number of owner-builders who would only construct one home. Also, less than half of those who actually built a SGC home have attended SGC training. This raises the possibility of improper installation and potential failure to meet program specifications.

Overall, the program has been a success. To date, over 70 local jurisdictions throughout the Northwest have adopted residential building codes at or near the MCS-recommended levels. The Washington Legislature adopted a statewide model code at very close to MCS levels on February 5, 1990, with implementation scheduled for July 1991. Oregon is in the process of administratively amending its

building code to near-MCS levels beginning in 1992. These two states account for approximately 90% of the region's new housing starts.

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