Super Good Cents Program Evaluation Final Report

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Prepared by Columbia Information Systems, INC.

Portland, Oregon

Executive Summary

The Super Good Cents (SGC) Program was established in l984 by the Bonneville Power Administration to promote the development of new energy-efficient electrically heated residences in the Bonneville service territory. The program was designed to promote the Model Conservation Standards (MCS) for new residential construction established by the Northwest Power Planning Council. The program offers training, advertising and promotion, and financial incentives. It is inherently a "lost opportunity" program in that it attempts to capture cost-effective residential energy savings that would have otherwise been lost if the new homes were built to current building standards.

Bonneville conceived of the program as a way for energy-efficient building practices to be sustained through market demand. Thus, it is primarily a marketing program. Primary goals for the program include: increasing consumer awareness, acceptance, and demand for new homes built to the MCS; increasing builder understanding and acceptance of the MCS while moving building practices closer to the MCS; and developing support for the implementation of the MCS in local and state building codes. The program is operated by participating public and investor-owned utilities. At the end of 1988, 113 utilities were operating the program.

In 1985, Bonneville contracted with Columbia Information Systems (CIS) to conduct an evaluation of the SGC program. This evaluation was designed to provide an on-going analysis of the development, operation, and outcomes of the SGC program. This report comes after four years of program operation. Two previous interim

reports were also prepared for Bonneville by CIS (August 1987 and September 1988). The reader is referred to these reports for a detailed description of program design and development.

Aside from a process analysis, the evaluation measured a number of outcomes. These include the number of SGC homes constructed, the penetration rate of SGC homes among all new electrically heated homes, program operation costs, and consumer and builder attitudes and actions with respect to program objectives. Two companion studies examined the performance of SGC homes and their construction costs.

Key Findings

Program Awareness

- The program's consumer awareness targets have been met or exceeded each year. Program awareness has increased steadily each year up through 1987. After the first year of program operation, 20% of the consumers in the program territory were aware of SGC homes. In l986, that number more than doubled to 48%, rising to 73% in 1987, and dropping to 61% in 1988 when several large investor-owned utilities (IOUs) joined the program. Exclusion of these new utilities reveals that awareness has stabilized among the public utilities (to 75%) near the high level set in 1987.
- Program awareness among builders working in the program territory has also achieved a dramatic increase since first measured in 1986. Nearly half (48%) of the builders were aware of the program in l986. Awareness rose dramatically to 79% in l987 and held relatively steady at 82% in l988.

Conclusion: The program has been effective in achieving its awareness objectives. The task ahead is to maintain the existing high level of awareness among the established utility programs and to increase it in the territories of the newer program participants.

Program Penetration

- The absolute number of certifications have practically doubled every year resulting in a total of 3,221 single-family homes and 3,005 multi-family units certified since the beginning of the program. Over half of these occurred in l988, with most coming from utilities in Washington.
- The program has been less successful in achieving its targets for the primary program outcome: penetration among new electrically heated homes in the program territory. After nearly achieving program targets in l986 (7% versus 10% target), and l987 (19% versus 20% target), we find a slight decline of overall penetration to 17% in l988 even though the absolute number of certifications has increased. However, this penetration level is far below the program target of 40% for l988.
- As with awareness, this result is partially attributable to the influence of the new large IOUs with their large number of housing starts. Nonetheless, with these utilities excluded, we find only a slight increase in penetration to 21% for the established program participants, still nearly half of the l988 target. Even among those utilities that have operated the program for a year or more (joining prior to l988) we find only a slightly higher combined penetration (21%) than among newer public utility participants (19%).
- Average penetration for utilities operating the program for three years or more was around 26%, whereas the average for utilities operating the program for one to two years was 11%.
- Forty-nine utilities (43% of participants) have exceeded 20% penetration. Twenty-three utilities (20% of participants) have exceeded the program target of 40%, thus indicating that the target is achievable and that considerable improvements can be made within individual utility territories. However, most of these are small or medium-sized utilities, but a number had high levels of new housing starts. None of the larger utilities achieved higher than 25% penetration. The average for all utilities with 100 electric starts or more was 19%.

- An analysis of utilities in the program prior to l987, and with some certifications, found that just over half (55%) had decreasing, decelerating, or steady penetration rates in l988 compared to l987. Conversely, 45% had positively increasing penetration.

Conclusion: Although the absolute number of certified homes will continue to increase, our analysis indicates that penetration levels will not increase as rapidly in the future as they have in the past. It will be difficult for the program to realize large increases in penetration. It is likely that the upper limit of penetration will be well short of the 60% target as long as program conditions (i.e., incentive levels, Bonneville support, and utility support and emphasis) remain as they are. In addition, the ramp-up time of the new utilities will probably ensure that penetration will remain below the target for the next few years.

Program Participation

- By the end of l988, 113 utilities were operating the SGC program. While this represents 88% of all eligible utilities, it includes almost all of the utilities not operating an alternative program, or operating exclusively as an Early Adopter jurisdiction. Four of the six large investor-owned utilities joined in 1988, resulting in a dramatic increase in the proportion of the region's residential consumers represented by participating utilities (from 34% 1987 to 73% in 1988).
- The degree of participation as measured by FTE dedicated shows a wide variation, from as high as 26 FTE to nearly zero. The average for all participants is about 1.4 FTE, with the total program staffing in excess of 115 FTE region wide. Generally, utilities with higher penetration had greater productivity per staff FTE, i.e., more certifications per FTE than those with lower penetration levels.
- The number of builders building at least one SGC home has steadily increased each year. There was a four-fold increase from 78 builders in 1985 to 383 new builders in 1986, followed by 406 new builders in 1987, and 523 in 1988. A total of 1,390 builders have now built at least one SGC home. The increase

in 1988 exceeded the program objective of increasing the number of builders by 25% over the 1987 total.

- In general, there has been a low level of repeat-participation in the program by builders. Nearly three-quarters of participating builders (72%) have only built one SGC home. It was found that about one-quarter (26%) of the one-time builders were owner-builders (19% of all SGC builders). Excluding this group, we find that 65% of all "professional" builders in the program have only built one SGC home. Four builders, however, have built more than 30 SGC homes each.

Conclusion

Although several key participation requirements for program success have been achieved, i.e., a high level of utility participation combined with a large number of participating builders, other important factors related to the level of participation may hinder program success. Specifically, enhancements are needed in increasing repeat performance by builders, and utility commitment in terms of staffing levels (FTE), expenditure of utility funds, and most importantly, Board support for the program.

Movement Toward the MCS

Movement towards the MCS here refers to the development of the technical capability to build to MCS levels and the support for energy efficiency in new home construction and support for MCS levels in building codes. Program influences in these areas include training, changes in building practices, and changes in consumer and builder attitudes.

Training Attendance

All participating utilities now have at least one staff person that has attended program training. As of the end of 1988, 294 utility staff have attended the introductory training.

A large number of builders have attended some program training. By the end of 1988, 4,292 builders had attended introductory training. This number represents 12% of all people in the region identifying themselves as homebuilders in the 1980 census, many of whom probably work for larger building contractors.

Changes in Building Practices

SGC builders surveyed generally build to higher levels in their typical homes than non-SGC builders. There has also been a general trend toward increased efficiency levels among both SGC and non-SGC builders. Among all builders surveyed over the past three years, there has been a slight shift toward walls built to R-19 or greater, toward floors built to R-19 or greater, and toward R-38 or greater ceilings. There has also been a steady increase toward double-glazed thermally improved windows. Although much of this change has been influenced by changes in the building codes in Oregon and Washington in 1986 and the adoption of the MCS as code in a number of jurisdictions, the SGC program has aided in the transition through training, direct construction experience guided by utility staff, and by providing homes to serve as examples for other builders.

Attitudes Toward Energy Efficiency

- From analysis of the annual consumer surveys we found that a clear majority of consumers each year felt that energy efficiency is "very important" when considering a new home. After an increase from 70% in 1986 to 77% in 1987, there was a decline to 64% of consumers feeling this way in 1988. However, energy efficiency was not found to be a major criterion in home selection. Only 7% mentioned it specifically in 1986, dropping to 3% in 1988. Nonetheless, a majority of consumers have said each year that they would be willing to spend $4,000 or more for energy efficiency features in a new home.
- Less than half (46%) of the builders surveyed in 1986 considered energy efficiency to be "very important" to homebuyers when considering a new home. There was a decline in 1988 to 39% of

builders. These percentages are still lower than found among consumers asked about the importance of energy efficiency, as noted above. Thus, builders give energy efficiency less importance than homebuyers do.

- Builders also felt that homebuyers were willing to spend some additional money on energy-efficiency features, but less than that reported by the consumers themselves. An average of $1,551 was reported in 1987, dropping somewhat to $1,015 in 1988.

Support for Codes

- Over the past three years, a majority of the consumers have not felt that the level of energy efficiency in their current building codes were sufficient. As a result, nearly three-quarters of the consumers surveyed each year said they would support stricter standards.
- It was also found that about three-quarters of the builders surveyed support energy efficiency standards in building codes. This support has remained steady over the last three years. More importantly, over half of the builders each year said they supported codes set at SGC/MCS levels.

Conclusion

There appears to be a general movement toward support for MCS levels of construction in practice and in support from consumers and builders. There is also a growing infrastructure of trained builders and utility staff, though it is not know how easily the remaining untrained builders will be able to make the transition to MCS level construction. The least enthusiastic finding is that, although consumer interest in energy efficiency has remained high, there still does not appear to be a high demand for energy efficiency features in new homes. This can be a barrier to builders' decisions to incorporate these features.

Other Finding

Advertising and Promotion

- Program advertising was critical in developing consumer awareness of SGC homes, accounting for between two-thirds and three-quarters of the consumer awareness over the years of the surveys. Television advertising has remained the primary source of awareness for consumers (41% in 1988) followed by newspaper advertising (16% in 1988).
- For the people who actually bought SGC homes, there is no dominant source of awareness. The sources are split between builders (18%), newspaper (15%), television (14%), and personal contact by utility staff (14%).
- For builders, the single most mentioned source of awareness was the utility (44% in 1987 and 46% in 1988), mostly via the mail. The next most mentioned source was other builders emphasizing the potential snowball effect among builders.
- Advertising has not been as successful in communicating the details of what a SGC home is. Less than half of those aware of a SGC home in both 1987 and 1988 could recall any specific features of a SGC home.

Program Costs

- Total program expenditures from the beginning of the program through the end of FY88 (9/30/88) have been about $20 million. Nearly half of this ($9.5 million) went to utilities for operations, advertising, and incentives. The incentives accounted for $4.4 million. Nearly $5 million was spent by Bonneville on the regional advertising campaign, and about $5.4 million was spent on training, technical assistance, and monitoring.
- The total program costs spread over the 6,226 certified homes results in a cost of $3,261 per SGC home.

- The total program costs per home have been declining over the years. In 1986, we find $5,204 per certified home; in 1987, $4,534; and in 1988, a significant decrease to $1,850. The drop in 1988 reflects a decrease in expenditures while there was a large increase in certifications.

Incremental Costs to Build SGC Homes

- In a separate study conducted by CIS and ERC, preliminary findings indicate there was a total cost increment of $1,541 for a SGC home with zonal resistance heat compared to its current practice counterpart. For heat pump homes, this difference was found to be $1,081.
- Cost differences varied by climate zone as well. The lowest for resistance heat homes was found in Zone 1 ($1,209), followed by Zone 2 ($1,624); the highest was in Zone 3 ($2,092).

Overall Assessment

Based on the findings and conclusions above, it is apparent that the program has had a number of successes, as well as some significant drawbacks.

- The chief successes of the program include the following:
- It has raised region wide awareness of both energy efficiency and SGC.
- It has trained builders and utilities all over the region and familiarized them with the Model Conservation Standards.
- It has achieved a high level of participation among utilities.
- It has created over 6,200 SGC housing units and saved the energy that would have been lost had these been built to current practice.
- It has created or sustained jobs and contributed to local economies through related spending.
- It has developed support for the Northwest Energy Code.
- And above all, it has increased regional capability to offer energy-efficient new construction.

On the downside, the program has some drawbacks.

- It is a costly program to operate in terms of labor requirements and in advertising and incentive costs.
- The labor and training put into each builder are not being spread over many jobs, as many builders have built only one home under the program. There is an unknown level of compliance leading to a degree of uncertainty about the acquired resources.
- The program appears to have a limitation as to the level of penetration achievable within current program design. To achieve significantly higher penetration will require that all larger utilities will have to have a penetration near 50% or more. With current utility staff levels, it will be critical to achieve nearly complete participation by large volume builders and builders of multi-unit dwellings.

Recommendations

A number of recommendations arise from findings of the evaluation.

- Work with volume builders and builders of multi-family buildings.
- Work with and encourage less committed and poorly performing utilities, particularly when those utilities have sufficient staff and high levels of housing starts. Solutions must be utility-specific and handled case-by-case.
- Encourage greater utility staffing along with efforts to enhance productivity of staff, placing particular emphasis on high growth areas and volume builders.
- Focus efforts on professional builders who have built only one SGC home. Encourage them to build others.
- Continue offering financial incentives.
- Continue builder training and offer refresher courses.
- Focus advertising on active buyers and target ad positioning where these buyers would most likely see them.

Future Research

Additional research is recommended in the following areas.

- Levels of compliance with program specifications.
- Continued penetration tracking.
- Assess the impacts of reduced incentives.
- Monitor changes in building practices.
- Assess the impacts of future changes in Oregon's building code.
- Continue the process evaluation of the program and conduct comparative case studies of utilities with high performance and those with low performance.