

**TRACKING CONSUMER ATTITUDES ON
ENERGY CONSERVATION IN THE PACIFIC NORTHWEST**

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ABSTRACT

Measurement of consumer attitudes and characteristics allows for the segmentation of the market in a variety of ways to aid in the development and implementation of effective energy conservation programs in the residential sector. Pacific Northwest Laboratory has been conducting marketing analyses for energy conservation activities in the Pacific Northwest for Bonneville Power Administration since 1983. Work completed to date includes a regionwide telephone survey of consumer attitudes conducted in 1983 and several studies characterizing and analyzing specific market segments. In late 1985, a second regionwide consumer attitudes survey was conducted and analyses of the survey data are being performed.

The purpose of this paper is to present the results of a tracking analysis of the changes in consumer attitudes and behaviors between 1983 and 1985. Consumer understanding and perceptions of energy conservation and other issues are explained first. Results concerning past and potential energy conservation actions, financing, and impacts of energy conservation investments are then presented and a simple scheme of market segmentation is discussed. Some implications of the findings are explored.

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Energy utilities and all levels of governments in the U. S. have developed and implemented programs to promote energy conservation since the mid 1970's. Many programs have been successful in reaching the consumers in a variety of ways such as provision of information, free energy audit, incentives, free or low interest financing, or even subsidies for the installation of energy conserving technologies. However, adoption rates of energy efficient equipments and other conservation technologies have not been high. For example, with the Residential Conservation Service program sponsored by the U.S. Department of Energy, less than 5% of eligible households requested a free energy audit and those receiving audits implemented a modest number of energy conservation measures (Rudelius, Weijo, and Dodge 1984; Coltrane, Archer, and Aronson 1986).

More recently, electric utilities have given an increasing emphasis on shaping, instead of merely reacting to, demand for electricity with demand-side management programs such as time-of-use rates, interruptible rates, direct load controls, weatherization, appliance efficiency programs, and so forth. A survey by Electric Power Research Institute survey estimated that about 300 utilities were conducting over 1500 separate demand-side management programs (Gellings, Hirshberg, and Williams 1986).

In utility conservation programs and other demand-side management programs, an ingredient that is critical to the successful planning, development, and implementation of such programs is a better understanding of customer attitudes, needs, preferences, and behaviors (Sawhill and Silverman, 1983; Gellings, Hirshberg, and Williams, 1986). In a review of successful residential energy conservation programs, it was found that such programs commonly utilized existing social networks, focused on the transmission of vivid and personalized information from credible sources, and used peer groups (Coltrane, Archer, and Anderson 1986).

In the Pacific Northwest, the concept of conservation as a resource to meet the demand for electric power has been institutionalized since the release of the 1983 Northwest Conservation and Electric Power Plan developed pursuant to the Pacific Northwest Power Planning and Conservation Act of 1980 (P.L. 96-501) (Northwest Power Planning Council, 1983). Under the plan and its recent update (Northwest Power Planning Council, 1986), the Bonneville Power Administration (BPA) is responsible for implementing many elements of the plan, including acquisition of conservation resources. Over the last few years, BPA has been conducting several programs in residential weatherization, low-income weatherization, appliance efficiency, and energy efficient new homes (BPA

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1985). To better plan and develop conservation programs and implement them successfully, BPA is interested in obtaining a deeper understanding of consumer attitudes, interests, opinions, and behaviors.

It is under such circumstances that region-wide surveys of household attitudes toward energy conservation were conducted in 1983 and 1985, respectively. The purpose of this paper is to present the preliminary results of a tracking analysis of the changes in consumer attitudes and behaviors between 1983 and 1985. The background and methodology of the study are first explained. Then findings with respect to perceptions of energy conservation, energy conservation actions, and market prospect groups are discussed. Finally, some implications of the findings are explored.

BACKGROUND AND METHODOLOGY

Two region-wide surveys on consumer conservation attitudes and behaviors have been conducted for the Pacific Northwest respectively in 1983 and 1985. In the baseline study, a telephone survey of 2000 residents of the Northwest was conducted. The sample was drawn to be a representative cross-section of the Northwest and was composed of 500 respondents from each of the four geographic divisions which make up the region: Western Washington; Western Oregon; Eastern Oregon and Southern Idaho; Eastern Washington, Northern Idaho and Western Montana. The respondents were adult heads of households. Only one respondent was interviewed per household. Eighty percent of the interviews were conducted during evening and weekend hours between October 30 and November 13, 1983. Three-fourths of the 2000 interviews lasted approximately 20 minutes. Interviews with the other 500 respondents lasted approximately 10 minutes longer, due to the inclusion of questions relating specifically to heat pump and solar water heaters.

The results of the baseline study were published and compared with results from other studies (RMH Research Inc. 1984a; J. M. Fang, 1985). A companion survey on the marketing environment for solar and heat pump water heaters was also conducted (RMH Research, Inc. 1984b).

In the 1985 survey, 1058 telephone interviews were completed. The sample was drawn in a similar manner as in the 1983 survey. Interviews were conducted from October 15 through November 8, 1985. Calls were made from 4 to 9 p.m. on weekdays and from 10:30 a.m. to 7 p.m. on Saturdays and Sundays. Each interview took between 35 and 45 minutes to complete. The refusal rate was 13% and the termination rate was 10%.(1) The data and analyses of the 1985 survey are being documented in a series of reports on tracking the changes between 1983 and 1985, on segmenting and characterizing consumer groups, on fuel switching, and on financing conservation investment.(2)

The tracking report describes the 1985 attitudes, perceptions, and behaviors of the consumers and compares them with the 1983 survey results to identify any changes that are statistically significant. In comparing two proportions, the statistical Z test of the difference between two proportions at 5%

significance level is used to determine whether the observed numeric differences are statistically significant or not. In statistical tables, an asterisk (*) is used to indicate that a specific value is "significantly higher" than its comparison value, and a tilde (~) is used to indicate that the value in question is "significantly lower" than its comparison values.

COMPARISON OF SOME SAMPLE CHARACTERISTICS

Some differences in the demographic and other characteristics of the two samples, which may affect the reliability of the comparison of attitudes, actions, and perceptions are noted below:(3)

- Compared to the 1983 sample, the 1985 sample is composed of a larger proportion of female respondents (62% vs. 54%). This higher proportion of females in the 1985 sample may have affected the education and occupational characteristics of the sample, noted below.
- The 1985 sample has a higher proportion of those who have at most a high school graduation than the 1983 sample (45% vs. 36%), and a smaller proportion of those with at least some college education (34% vs. 50%).
- There is a significantly larger group of respondents whose occupation is in the "clerical-sales-technician" category (16% in the 1985 sample vs. 7% in the 1983 sample) and a smaller group in the "crafts-foreman" category (7% vs. 15%).
- The 1985 sample has a larger group of single-person households, 18.6% versus 14.5% in 1983.
- The 1985 sample has a smaller proportion of households living in buildings with 4 or more units (6% vs. 8%).
- It appears that there are almost twice as many respondents who have moved in the last year in the 1985 sample as those in the 1983 sample (22% vs. 10%).
- Those who have stayed in the current address for between 1 and 4 years are correspondingly fewer (22% vs. 31%).

There are no significant differences in characteristics such as age distribution, income distribution, own/rent, other types of dwelling, primary heating fuel, and number of persons in the household between the 1983 and 1985 samples.

PERCEPTIONS OF ENERGY CONSERVATION

Understanding of Energy Conservation

Between 1983 and 1985, the Northwest consumers' understanding of the term "energy conservation" has moved toward more mentions of definitions falling into the general category of "conserve or save energy." In 1983, when multiple mentions were permitted in the survey, 74% of respondents gave mentions belonging in this category. In 1985, without multiple mentions, the proportion was 86%. Since the 1985 data included only the first mention and the 1983 data included second and third mentions, the differences between the two years are conceptually wider than the numeric difference would suggest. People were less likely to associate the term "energy conservation" directly with specific actions, saving money, or social responsibility in 1985 than in 1983: The proportion of respondents who defined energy conservation in terms of specific actions fell from 37% to 1%; those expressed in terms of saving money decreased from 19% to less than 1%; and those expressed in terms of social responsibility was lowered from 8% to zero.

Within the general category of "conserve or save energy", a much larger proportion of respondents in 1985 defined energy conservation to mean "use energy intelligently or efficiently" than in 1983 (40% vs. 8%). This might imply that more people in the Northwest are understanding energy conservation as efficient use of energy, rather than simply as using less energy or associating it with deprivation.

Concern About Various Issues

Seven of the nine general issues of concern to consumers included in the 1985 survey were also included in the 1983 survey: energy conservation, inflation, unemployment, cost of energy, the environment, crime, and energy use in the home. The other two issues not included in the 1983 survey were cost of groceries and wildlife preservation. The intensity of consumers' concern about these issues, as measured by the proportion of respondents who were very concerned about an issue, had become lower in 1985, when compared to the intensity in 1983:

- Among the seven issues common to the 1983 and 1985 surveys, the largest drop in the proportion of respondents who were very concerned about a specific issue occurred in the cost of energy issue. It dropped 19 percentage points from 70% in 1983 to 51% in 1985.
- For the three issues of unemployment, energy use in the home, and energy conservation, the proportion of respondents who were very concerned about the specific issue fell more than 10 percentage points. Specifically, the proportion for unemployment fell from 63% to 48%; that for energy use in the home from 48% to 35%; and, for energy conservation, the percentage fell from 48% to 33%.

- In both 1985 and 1983, the two issues of energy conservation and energy use in the home, had the lowest proportions of respondents who indicated that they were "very concerned." In 1985, the issues of energy use in the home and energy conservation were also lower than the proportions of respondents who were very concerned about the two new issues introduced into the survey, cost of groceries and wildlife preservation.

These results suggest that, although people in the Northwest were concerned about energy conservation and energy use the home, the intensity of this concern was not as high that of the concern of other issues included in the survey. Therefore, it can be concluded that there is a need for continued public awareness and information dissemination programs to maintain public interest in energy conservation.

Psychographical Factors

The 1985 survey included 15 statements concerning energy use and conservation, with which the respondents were queried as to whether they agreed or disagreed. These statements were classified into four categories: social responsibility, self interest/materialism/lifestyle, limits to energy conservation, and cynicism/negative view toward energy conservation. Table I presents the data for the 10 statements that were included in both the 1983 and 1985 surveys. Three general conclusions can be made of the psychographic profiles of consumers in the Northwest:

- Consumers generally tended to be more in agreement with statements in the categories of "social responsibility" and "self-interest, materialism and lifestyle" than in the other two categories. Conversely, people were more in disagreement with the statements concerning the "limits to conservation" and "cynicism/negative view on energy conservation" categories than with statements in the "social responsibility" and "self-interest, materialism and lifestyle" categories.
- The patterns of agreement and disagreement with individual statements appear to be parallel to each other between the two surveys.
- The proportions of those agreeing with the statements in 1985 appeared to be somewhat higher than those for 1983 for the statements in the social responsibility category and those in the "self interest/materialism/life style category, except for the statement that "I would only make conservation investments which would enhance the value of my home." The proportion of those agreeing with the cynic view that "the amount of energy I use is really my own affair and no one else's" was also higher in 1985 than in 1983.

TABLE I. Psychographic Profile, Agreement and Disagreement with Statements, 1985 Versus 1983

Item	Agreement		Disagreement			
	1985	1983		1985	1983	
		A	B		C	D
	Percent					
<u>Social Responsibility</u>						
It's our responsibility to conserve electricity for future generations	85.2*	70.6	77.0	10.4*	7.6~	9.0
Conserving energy is the best way to protect the environment	72.4*	40.5	51.0	17.5*	8.8~	15.3
<u>Self Interest/Materialism/Lifestyle</u>						
Most people who conserve electricity do so to save money	92.2*	74.5	82.2	6.1	3.6	5.4
I would only make conservation investments which would enhance the value of my home	24.1*	19.4~	24.5	70.8*	34.5	45.5
Conserving energy is the best way to maintaining my lifestyle	63.5*	35.7	45.5	26.5*	12.6	18.0
<u>Limits to Energy Conservation</u>						
I only use electricity when it's really needed; there is no way I can cut down	46.1*	41.7~	49.8	50.0*	11.5	17.5
I have already done everything I can to conserve energy	37.5*	18.7~	39.8	60.1*	18.7	27.2
<u>Cynicism/Negative Views on Energy Conservation</u>						
The amount of energy I use is really my own affair and no one else's	47.0*	26.0	31.2	41.6*	31.0~	40.0
It's silly to conserve electricity, because the electric utility just turns around and charges more for what you do use	30.7	27.5	33.3	63.6*	34.1	41.2
My conservation efforts won't have much effect one way or the other on the availability of electricity	21.2~	21.8	27.6*	74.3*	33.8	42.7
Notes:	A - Highest three scores (10, 9, 8)		* significantly higher			
	B - Highest four scores (10, 9, 8, 7)		~ significantly lower			
	C - Lowest three scores (2, 1, 0)					
	D - Lowest four scores (3, 2, 1, 0)					

ENERGY CONSERVATION ACTIONS

No/Low Cost Measures

In 1985, most no/low cost energy conservation practices by Northwest consumers appeared to stay about the same as, or at a lower level of activity than, in 1983.

- Use of shades and drapes for heating and cooling and the lowering of the thermostat setting during the heating season remained the two most frequently practiced measures; 9 out of 10 respondents said they regularly used shades and drapery and 8 out of 10 lowered thermostat setting.
- Among the 8 measures considered, 4 showed no significant changes either way in the proportions of respondents who regularly practiced them: using shades and drapes for heating and cooling (88-90%), wrapping the water heater (about 62%), using water flow restrictors in showers (about 35%), and receiving an energy audit (26-27%).
- Another three measures showed decreases in the proportion who regularly practiced them: selecting energy-efficient appliances when purchasing new ones (from 71% to 60%), controlling lights with dimmer switches or timers (from 45% to 41%), and putting plastic over windows (from 60% to 33%).
- The only measure showing a significant increase in the proportion of respondents practicing it (from 81% to 84%) was lowering the thermostat setting during the heating season.

Energy Conservation Measures

For installation of energy conservation measures, five of the nine measures common in the two surveys showed significant increases in the proportions of homes equipped with specific ECMs from 1983 to 1985: roof/ceiling insulation (from 77% to 92%), outside wall insulation (64% to 82%), weatherproofing (71% to 81%), storm windows (67% to 79%), and clock thermostat setback (29% to 44%). For three ECMs, the proportions of homes equipped with them stayed relatively the same in 1985 as in 1983: storm or insulated doors (61-62%), floor, basement or crawl space insulation (54-56%), and heat pump furnace. Wood stove/furnace was a major exception because it showed a significant decrease in the proportion of homes so equipped. A large part of this reduction in the proportion can be attributed to the introduction of fireplace insert as a separate item in the 1985 survey. In the 1983 survey, there was no separate item of fireplace insert. As a result, many respondents may have included fireplace insert in their responses to the question on wood stove and thus led to a higher proportion of homes equipped with wood stove/furnace for the year.

Comparison of claimed installation of ECMs during 1984-85 with the intention to install revealed in the 1983 survey that the stated intentions far exceeded the installations claimed in the 1985 survey in only two cases: clock thermostat setback and heat pump furnace. In the other seven cases, claimed installations during the last two years either exceeded or matched the respondents intentions in the 1983 survey. This suggests that the responses to the question as to how likely the consumers are to install specific ECMs in the next two years could potentially be useful for conservation planning purposes.

During the two year period of 1984-85, the average investment in installing energy conservation measures by homeowners who had made much investment was about \$1400, compared to the average investment of \$1800 for the 3-year period of 1981-83. If the average amount from the 1983 survey were converted to cover a two year period, the the average investment can be said to stay about the same in the range of \$1200 to \$1400 for a two-year period.(5)

Financing and Other

Conservation Financing. The 1985 results on conservation investment financing are consistent with the 1983 results in the sense that current income, savings, bank and utility loans, and utility payments were the most frequently mentioned sources of financing. It is also concluded that delaying or cutting back on other purchases and federal tax credits are important supplementary sources for financing conservation investment, rather than the primary sources.

Likely Installation of ECMS. In 1985, the proportions of owner-occupied homes not currently equipped with specific ECMS and are likely to install ECMS in the next two or three years in the total number of owner-occupied homes stayed in the range of 4% to 14%, comparable to the range of 6% to 13% in the 1983 survey. There is, therefore, substantial potential in the near future for conservation investment in the region. This potential is even higher with the inclusion of those indicated very likely or likely to install more of the ECMS such as weatherproofing, insulation over the ceiling and under the roof, in the walls, and under the floor, in the basement or in the crawl space.

Other. Homeowners who had invested in energy conservation measures during 1984-85 speculated that the value of their home had increased, on the average, by 110% of the investment made, much less than the 160% increase of the investment made found in the the 1983 survey. Homeowners also claimed that the investment they made lowered their monthly electric bills by \$55 in 1985, compared to the average reduction of \$32 per month in the 1983 survey.

MARKET PROSPECT GROUPS

Homeowners in the region were grouped into three prospect groups using two segmentation criteria. One segmentation criterion is past investment in ECMS: "limited" past investment for 0 or 1 item; "moderate" past investment for 2 to 7 items; and "heavy" past investment for more than 8 items. The other segmentation criterion is likely future investment in the next 2 to 3 years: "minimal" future investment for zero ECM; "moderate" future investment for 1 or 2 ECMS; and "high" future investment for over 3 ECMS. Applying these two criteria creates nine market segments. These nine segments can further be classified into market prospect groups: First-tier prospect, Second-tier prospects, and Non-prospects. The First-tier prospect group is defined to include the three market segments of heavy-high (Segment I in Figure 1), moderate-high (H), and heavy-moderate (F). The Second-tier prospect group covers the three market segments of heavy-minimal (C), moderate-moderate (E), and

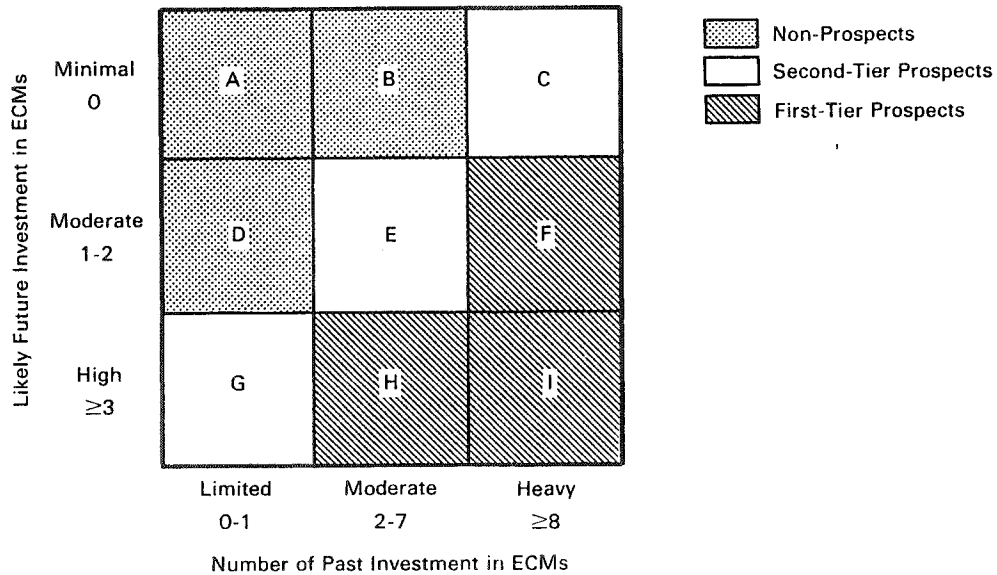


FIGURE 1. Segmentation of the Residential Energy Conservation Market (excluding renters)

limited-high (G). The Non-prospect group includes the other three segments of limited-minimal (A), moderate-minimal (B), and limited-moderate (D).

The above groupings are based on the a priori assumption that past behavior is the best indicator of possible or potential future behavior. Prior investors are more likely to make additional investments than those who have not invested or those who have invested less. Under this assumption, Segment C is "upgraded" to be in the Second-tier Prospect group and Segment F upgraded to the First-tier Prospect group due to the strength of their past investment behaviors. Another premise is that, although expressed intent is an indication of likely behavior, lack of previous behaviors would suggest that the expressed intention may need to be discounted. For this reason, Segment D is "downgraded" to the Non-prospect group and Segment G downgraded to the Second-tier Prospect group.

- In 1985, the size distribution of the three prospect groups remained relatively unchanged from that in 1983. First-tier prospects accounted for about 10 to 12% of the region's households. Second-tier prospects made up about one third of the region's households (32-33%). The Non-prospects amounted to 30-31%. The rest were renters (24-28%) (see Table II).

TABLE II. Distribution of Prospect Groups

Group	Including Renters		Excluding Renters	
	1985 (%)	1983 (%)	1985 (%)	1983 (%)
First-Tier Prospect	10.4	11.8	14.4	15.5
Second-Tier Prospect	31.6	33.3	43.6	43.9
Non-Prospect	30.4	30.9	42.0	40.6
Renter	27.6	24.0	--	--

- In 1985, there were some changes in the psychographic profiles of prospect groups in the sense that there were significantly larger proportions of respondents who agreed with with 5 of the ten statements probing consumers' attitudes towards energy use and conservation, compared to those observed in 1983. Of the remaining five statements, the proportion of respondents who agreed with the statement that my conservation efforts won't have much effect one way or the other on the availability of electricity decreased for all three prospect groups. The proportions of respondents who agreed with the other four remained unchanged.
- The First-tier prospects were more likely to be very concerned about energy use in the home, and energy conservation than the Non-prospect. The same was also true for issues such as inflation, crime, and the environment.
- Non-prospects were less likely than First- and Second-tier prospects to regularly practice no/low cost conservation actions, except for putting plastic over windows.
- By definition, the Non-prospects were less likely than respondents in the two prospect groups to have their homes equipped with specific ECMs.

CONCLUSIONS AND IMPLICATIONS

- Between 1983 and 1985, consumers in the Northwest have increasingly viewed energy conservation as using energy intelligently or efficiently. This suggested better understanding of energy conservation on the part of households. Moreover, they are even more likely in 1985 than in 1983 to agree with statements reflecting social responsibility and self interest, materialism, and lifestyle. They are also even more likely in 1985 than 1983 to disagree with statements reflecting limits to energy conservation, cynicism, or negative views on energy conservation. Hence, there seemed to be some internalization of energy conservation consciousness. It would be useful to explore ways to tap this heightened level of conservation consciousness, perhaps in terms of product, price, distribution and communications

strategies suggested by Rudelius, Weijs, and Dodge (1984) or via the checklist on marketing and delivering conservation developed by Coltrane, Archer, and Aronson (1986).

- However, between 1983 and 1985, the intensity of concern about energy use in the home, cost of energy and energy conservation declined, following the declining trend in the intensity of concern about issues such as unemployment, inflation, and the environment. This is probably due to changed external conditions such as the power surplus that was increasingly being reported in the news media, and the relatively more stable or declining energy prices. Reflecting the reduced intensity of the concern about energy related issues and the heightened level of energy conservation consciousness, most of no/low cost energy conservation practices appeared to stay about the same, or at a somewhat lower level of activity in 1985 than in 1983. The only measure showing a significant increase in the proportion of respondents who regularly practiced during the 1983-85 period is lowering the thermostat setting during the heating season.
- In 1985, the self-reported saturation ratios of, (i.e., proportions of homes equipped with), specific energy conservation measures have stayed either about the same as, or were somewhat higher than, in 1983. This is consistent with a trend that was identified earlier from a comparison of results of several separate surveys (Fang, 1985a pp. 3.1 to 3.8 and Appendix A; Oregon Department of Energy 1983; and Western Rural Development Center, 1982).
- The size distribution of the prospect groups in 1985 remained relatively unchanged from that in 1983: First-tier prospects accounted for about one in 10 households; Second-tier prospects, about one-third of the region's households; Non-prospects, slightly less than one third. About a quarter of the region's households were renters. These prospect groupings have special implication under the region's current power supply situation.

The Northwest is in a period of power surplus which may extend well into the 1990's. During such a period, aggressive acquisition of conservation with subsidies and rebates is likely to adversely impact the financial position of the region's electric utilities. However, the power surplus does afford the opportunity to promote long-term energy conservation in a systematic manner. The current strategy of BPA and the Northwest Power Planning Council (1986) is "capability building", instead of actual acquisition of conservation. The objective of the strategy is to develop the capability to acquire conservation resources quickly when the need arises later, without actually purchasing conservation during the surplus period.

Under this overall strategy of capability building, different approaches are applicable to the three prospect groups. For the

First-tier and Second-tier prospects, the approach should be one of maintenance through promotional efforts. This could be done by reminding these consumers of the benefits they have received from past conservation activities and to reinforce their current behavior by persuading them to install energy conservation measures in the future. The main tool for such efforts is the provision of information to consumers about the benefits of installing specific ECMs. Examples can be drawn from specific cases. This approach can be implemented at relatively low cost.

For the Non-prospects, the appropriate marketing approach should be to actively develop them into Second-tier prospect group and eventually First-tier prospect group. It would be necessary to increase awareness and interest of these consumers on specific ECMs and to persuade them to invest in some ECMs, at least at some minimal level. Since the Non-prospects are likely to be low income households, some subsidies may be necessary (Johnson, Fang, and Ivey 1986).

- More recent developments in the Northwest power situation further intensified the need to reexamine the design of incentives in BPA's Residential Weatherization program. Declines in oil price had led California utilities to restart their oil-fired plants to generate electricity and stop or reduce purchases of electricity from BPA. At the same time, closings of aluminum plants in the Northwest induced by the competition and/or strikes further lowered the demand for BPA electricity and reduced revenues. To minimize the need to raise rates, BPA announced plans to reduce costs system-wide. The Residential Weatherization Program is therefore subject to cutback. The information collected in the two surveys would be useful in redesigning the incentive scheme which may be based on a sliding scale according to household income. This possible change in the program design appears to be contrary to the suggestion by Olsen (1985) to provide full-payment weatherization grants to all households regardless of income (p. 169). However, in the long run when the power surplus disappears and there is again a need to acquire conservation, the full-payment grant strategy would still be appropriate for weatherization measures which are cost effective.

FOOTNOTES

1. For detailed description of sampling design, survey procedure, and survey instrument, see Columbia Research Center, 1985 Marketing Environment for BPA Conservation Activities: Phase II, report submitted to Battelle Pacific Northwest Laboratories, December 6, 1985.
2. These reports are currently in draft form: 1) Fang, J. M. and B. L. Mohler, Tracking Household Energy Conservation Attitudes and Behaviors in the Northwest, Draft, April 1986; 2) Ivey, D. L., M. P. Hatstrup, S. A.

Shankle, and B. L. Moher, 1985 Consumer Segmentation: Assessment of the Market for Conservation in the Northwest: Phase II, Draft, April 1986;
 3) Ivey, D. L., M. P. Hatstrup, and B. L. Mohler, 1985 Fuel Switching: Assessment of the market for Conservation in the Northwest, Phase II, Draft, March 1986; and 4) Fang, J. M., M. P. Hatstrup, and B. L. Mohler, Financing Energy Conservation Investment in the Residential Sector, Draft, May 1986.

3. See Fang, J. M., op. cit. Appendix Table B.1 for the detailed statistics of the comparison. Also note that the 1985 values represent preliminary unweighted results. The final weighted results may be somewhat different from those reported in this paper.
4. According evaluation of BPA's Residential Weatherization Program, the cost of retrofit measures installed in homes of participants in the program averaged \$1600 (in 1982 dollars) for the 1982 participants, and \$1820 (in 1982 dollars) for the 1983 participants. Of the average total cost, \$100 were out-of-pocket cost for the 1982 participants and \$360 were out-of-pocket cost for the 1983 participants. For more details, see Hirst, E., et al. (1985), Table 11, p. 29.

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