DEMAND MANAGEMENT DEVELOPMENT DECISION MATRIX FOR LOW-INCOME/SPECIAL NEEDS CUSTOMERS: A PROGRAM RANKING AND MARKETING TOOL

Bonnie Brown Jacobson, Sara S. Ellison and Michelle L. Gallicchio
Northeast Utilities,
Ann L. Bachman, Technical Development Corporation,
and Frederick M. Gordon, Pacific Energy Associates

ABSTRACT

Least-cost planning, when practiced as a purely economic exercise, may not be capable of fully recognizing and evaluating program "benefits." As a result, the planning method could be criticized as being biased when used for planning electric and gas demand management for some customer segments where it is believed that program benefits extend beyond those considered for general demand management - especially for low-income, elderly, handicapped and other special needs customers. Northeast Utilities is concerned about this inherent bias and has developed an alternative evaluation process to work in tandem with least-cost planning for these important customers. The result of this process has been the identification of many programs and options that should meet both the electric and gas energy needs of those customers as well as those of NU. The value of this tool is that it manages extensive data for program options in an efficient manner, provides for the analysis and understanding of program elements on multidimensional levels that extend well beyond economics, and gives valuable guidance for marketing the selected options successfully to various special customer segments who are traditionally difficult to reach due to their unique needs and values.

This paper will describe the screening and ranking matrix and its underlying assumptions as developed by NU to evaluate a number of demand management program options for low-income/special needs customers. During the matrix development, NU drew on the experience of staff, consultants, other utilities, and research performed by EPRI and EEI in customer needs, values, preference and behavior. The ranking of the screened programs and customer segment marketing insights are presented and the use of this tool at NU is discussed.

DEMAND MANAGEMENT DEVELOPMENT DECISION MATRIX FOR LOW-INCOME/SPECIAL NEEDS CUSTOMERS: A PROGRAM RANKING AND MARKETING TOOL

Bonnie Brown Jacobson, Sara S. Ellison and Michelle L. Gallicchio
Northeast Utilities,
Ann L. Bachman, Technical Development Corporation,
and Frederick M. Gordon, Pacific Energy Associates

Least-cost planning, when practiced as a purely economic exercise, may not be capable of fully recognizing and evaluating program "benefits." As a result, the planning method could be criticized as being biased when used for planning electric and gas demand management for some customer segments where it is believed that program benefits extend beyond those considered for general demand management - especially for low-income, elderly, handicapped and other special needs customers. Northeast Utilities (NU) is concerned about this inherent bias and has developed an alternative evaluation process to work in tandem with least-cost planning for these important customers. The result of this process has been the identification of many programs and options that should meet both the electric and gas energy needs of those customers as well as those of NU. The value of this tool is that it manages extensive data for program options in an efficient manner, provides for the analysis and understanding of program elements on multidimensional levels that extend well beyond economics, and gives valuable guidance for marketing the selected options successfully to various special customer segments who are traditionally difficult to reach due to their unique needs and values.

BACKGROUND

NU, as an electric and gas utility company, has been a leader in the development and application of least-cost planning. In 1983, as part of a corporate commitment to the reduction of the need for building new electric supply alternatives, a system for the equitable evaluation of electric demand and supply alternatives for long-range planning was developed and instituted. This electric least-cost planning methodology, known as the Integrated Demand and Supply Planning (IDSP) process, was introduced to NU's regulators during a 1985 hearing process. Following that event, refinements were made to the process and results were published in a NU business plan for electricity service during 1986. Those results suggested that the least-cost approach to meeting the growth in customer electric energy requirements was through the implementation of both demand and supply options during the 25-year planning horizon.

The IDSP process required that 70 established and new demand options for electricity be reviewed in detail for applicability in meeting Company conservation and load management objectives. At that time, 16 characteristics for each option were evaluated ranging from load shape impacts to relative technology economics. These characteristics were compared to Company goals and filtered to yield a reasonable list of 14 potential electric demand management programs. These demand programs were then evaluated against possible supply options in the integrated planning model. The IDSP process identified 7 demand management options that were estimated to be the least-cost alternatives to 360 mW of new electric supply. The majority of these programs were planned to principally impact the commercial sector where there is a rapidly growing energy requirement within the NU service territory.

During regulatory review of the IDSP process and results, criticism was made of the inherent biased nature of the evaluation. It was pointed out that although the "screening" of the

70 total electric options was accomplished utilizing the latest available technical references and data, the programs proposed to be implemented within the service territory would do little to aid the special requirements of residential customers who may be having difficulty paying their energy bills and who may have very different values from those of the general public as addressed in the IDSP process. Although an effort was made to integrate customer needs and values within the IDSP screening process, these needs could not be explicitly included in the pure economic analysis required of least-cost planning.

Upon examination, it was recognized by NU that many of the "benefits" of options useful for serving special needs customers either extend beyond the value of electric energy savings and demand reduction measured in least-cost benefit/cost tests, or are too diffuse to quantify reliably. Thus, these program options rarely pass the least-cost tests resulting in the bias recognized within the IDSP process.

The NU IDSP process was developed specifically for electric business planning. It was felt that the gas business required a modified planning approach since both supply and demand options are less complex than those found in the electric business. Gas demand management is focused on end use efficiency and has fewer peak-load control options available as compared to electric options. This element also added to the bias issue raised for these special customer segments. Since state energy policies and corporate goals recognize the importance of serving these customers, an alternative process for this customer segment was developed and pilot tested for electric and gas demand management options by NU.

NU feels that this new approach to low-income/special needs program option screening allows for program definition and planning, meets state and company energy goals, serves the specific needs of these customers, and evaluates gas demand options as well as electric. NU also feels that its corporate objectives for community relations, customer service and least-cost planning are complementary and that demand management is an important part of their common ground. The demand programs found to rank high in this process should, therefore, be effective in meeting these varied objectives, if implemented. The review of the extensive option and customer attributes within this process has given new insight to the value of serving these customers and has highlighted the critical elements that should be considered for shaping demand programs for these customers.

THE SCREENING PROCESS

Selection of utility conservation programs for low-income and special needs customers is a complex task. Such programs must be designed to be practical to operate, but must also meet the varying needs of the program's constituencies: the utility, specific segments of low-income customers, and the community in general. But, since the Company's resources are limited, it must make choices among many programs that should be evaluated for many dimensions of value corresponding to constituency needs. This difficult task suggests the need for a screening process capable of comparing demand management programs on a number of dimensions in a way that shows planning and program attribute trade-offs. To accomplish this task, the project team, composed of NU staff and consultants, created a matrix of identified program option characteristics consisting of simple summary rules that quantify the relative importance of each proposed demand management program.

The Matrix

Program Attributes (Rows). The matrix rows are attributes of demand management programs that describe the values important to the utility, the low-income customer and the community, each considered uniquely. There are 63 attributes for each program that are grouped into blocks representing common characteristics. The first tier of 4 blocks, consisting of 32 value related attributes, are:

- Utility values that express the utility's objectives to implement cost-effective programs for serving a large proportion of low-income and special needs customers;
- Customer values that reflect bill reduction potential, comfort, safety and ease of participation in the program;
- Community values that concern employment and development of community organizations; and
- Feasibility considerations that examine ways to reduce program costs and improve chances for successful implementation.

The second tier of program attribute blocks are based upon the interests of and opportunities within key segments of the low-income and special needs market. Ranking of programs based upon these values alone indicates the applicability of each program to specific market segments. There are 6 market segments (blocks) defined for the matrix that are defined as:

- Homeowners (1-4 units, and can include landlords for small units),
- Tenants (1-4 units),
- Tenants of multifamily housing (>5 units),
- Landlords of multifamily housing (>5 units),
- Tenants of public housing (>5 units), and
- Landlords of public housing (>5 units).

There are 31 market segment attributes incorporated within these blocks.

This market segmentation recognizes that owner/renter status is a key element in the customers' decision-making process regarding conservation improvements and, therefore, should be key in program design and marketing. Also, the housing feature that bears most on the customer choice of conservation technologies is building size (e.g., number of housing units). Finally, these market segments are readily identifiable when designing a program promotional campaign.

All value and market segment attributes were determined through discussions with utility staff and through the review of research performed by the Electric Power Research

Institute (EPRI) and the Edison Electric Institute (EEI) in customer needs, values, preference and behavior. Each program attribute deserves consideration as programs are compared, but some are clearly more important to utilities than others. Therefore, weights of from 1 to 3 can be assigned to each attribute (with 3 being of highest importance). The weights utilized by NU were based on corporate goals and objectives for low-income demand-side management at the time of the screening and were influenced by regulatory direction.

Programs (Columns). The columns of the matrix represent the program options that have been screened. A total of 24 programs is allowed within the screening model. Twenty-one programs were identified for the NU screen through extensive literature and utility review. These programs address end-uses present in the homes of low-income/special needs electric customers. Fourteen such programs were identified for gas applications. Several programs are considered within each end use to reflect choices among varying levels of utility incentives (e.g., 50 percent and 100 percent) and customer involvement (e.g., customer installed vs. contractor installed). Different kinds of programs were considered for the purpose of identifying a comprehensive menu of possible end use options and include installation/retrofit programs, education programs and load management options.

Technical Approach

The screening process results in two separate matrix program rankings: one for electric customers and one for gas. Attributes are scored with values of from 1 to 3 per program (3 as more and 1 as less favorable or not applicable). Programs are systematically reviewed and scored relative to each other and each value attribute. These matrix rules provide for some consistency among users in a screening process where qualitative factors must be reviewed in a quantitative manner. A general illustration of the scoring approach is shown in Figure 1. Other features that illustrate the technical approach to the screening process are shown in figures that are cross sections of the NU version of the matrix model for electric programs (Figures 2 and 3).

Program attribute blocks are summarized (values x weights) and expressed as a normalized percentage of a maximum score. These Values Block (Total) Scores are shown in the last entry for each block as illustrated in Figure 2.

A Total Values Summary Score is developed and calculated as the sum of the block score times the block weight. Block weights are variable and were assigned by NU staff for this exercise as:

- Utility Values -- 30 percent
- Customer Values -- 30 percent
- Community Values -- 15 percent
- Feasibility -- 25 percent.

These values are totaled and summarized as a Total Values Score per Program (Figure 3). It is this Total Values Score that is used to rank program options, determine which of the options best meet low-income customer needs in general, and represents the results of the screen for an amalgam of the 6 market segments.

Screening Matrix Overview - Electric & Gas Programs

Tier 1

Blocks:

Reviewer qualitatively evaluates Attributes within these Matrix Blocks

- Utility Values
- Customer Values
- Community Values
- Feasibility Considerations

Calculations Performed by Screening Model for All Above:

- Attribute (Value) Scores
- Values Block Scores
- Normalized Block Scores

Tier 2

Blocks:

Reviewer qualitatively evaluates Attributes within these Matrix Blocks

- Homeowners (1-4 units)
- Tenants (1-4 units)
- Tenants of Multifamily Housing (>5 units)
- Landlords of Multifamily Housing (>5 units)
- Tenants of Public Housing (>5 units)
- Landlords of Public Housing (>5 units)

Calculations Performed by Screening Model for All Above:

- Attribute (Market) Scores
- Market Block Scores

Complete Matrix Calculation Performed by Screening Model:

- Total Values Score
- Total Scores Per Market Segment

Programs are then "Ranked" by Total Values Score and Total Scores Per Market Segment.

Figure 1. Low-Income/Special Needs Matrix Organizational Elements

Block Scores for each market segment are calculated similarly to the Values Block (Total) Scores described above and are illustrated in Figure 3 as "Market Scores Per Market Segment." Finally, total matrix scores for all blocks and attributes are calculated per program as the weighted average of the Total Values (summary) Score (80 percent) and the Market Scores for Market Segment (20 percent). These scores are the summary set of scores for specific market segments in the matrix and are also illustrated in Figure 3 as "Total Scores Per Market Segment." Market acceptance guidance per program is provided in a ranking of each by this Total Scores per Market Segment Value.

Software and Data

A spreadsheet template was developed to facilitate use of the extensive data evaluation and input as well as for the running of the screening model itself. The spreadsheet contains features which allow a model user to enter attribute values, summarize them, rank programs and print

			Low Cost Heating System and Envelope:		Major Heating System + Envelope (Weatherization):		
			PROGRAM 1	PROGRAM 2	PROGRAM 3	PROGRAM 4	PROGRAM 5
	UTILITY VALUES=	WEIGHTS	100% Incentive Self-Installed	100% Incentive Contractor Installed	100% Incentive	< 50% Incentive	0% Interest Loan
A1.	Energy Savings per Installation						
	-reduces Summer Energy	3	1	1	2	2	2
	-reduces Winter energy	3	2	2	3	3	3
	-reduces Summer Peak Demand	1	1	1	1	1	1
	-reduces Winter Peak Demand	1	2	2	3	3	3
A2.	Effective Life of Savings	3	1	1	3	3	3
A3.	Reliability of Savings	2	2	2	3	3	3
A4.	Size of Market	2	2	2	2	2	2
A5.	Number of Likely Participants	3	3	3	3	1	1
A6.	Directly Reduces Arrearages	3	1	1	2	2	2
A7.	Improvement in Customer Bill Management	3	2	2	3	3	3
A8.	Improves Customer Service/ Rapport	3	2	3	3	2	2
A9.	Improves Community Standing	2	2	3	3	2	2
A10.	Contributes to Program Diversity	2	1	1	1	1	1
		SUM X 3:					
	UTILITY VALUE TOTAL SCORE:	93	57%	62%	85%	73%	73%
	CUSTOMER VALUES=						
B1.	Ease of Participation	3	1	3	3	1	1
B2.	Minimal Customer Financial Contribution	3	3	3	3	1	1
B3.	Reduces Current Bills	3	2	3	3	3	3
B4.	Reduces Arrearages	3	1	1	2	2	2
B5.	Increases Comfort	2	3	3	3	3	3
B6.	Increases Safety	1	1	1	1	1	1
B7.	Educates re Energy Cost Control	2	2	1	1	2	2
B8.	Contribute to Maintaining Services	3	2	2	3	3	3
B9.	Lifestyle Changes	3	2	3	3	3	3
		SUM X 3:					
	CUSTOMER VALUE TOTAL SCORE:	69	64%	78%	87%	72%	72%
	COMMUNITY VALUES=						
C1.	Provides for Under-represented Populations	3	2	2	3	2	2
C2.	Employment Benefits	2	1	3	3	3	3
C3.	Strengthens Community Organization	2	3	3	3	3	3
C4.	Reduces Social Welfare Costs	2	2	2	3	2	2
C5.	Supports and is Supported by Other Programs for Low-Income Consumers	2	2	3	3	3	3
		SUM X 3:					
	COMMUNITY VALUE TOTAL SCORE:	33	67%	85%	100%	85%	85%
	FEASIBILITY=						
D1.	Administrative Simplicity	3	3	3	2	1	1
D2.	Program Lead Time	2	3	3	3	2	2
D3.	Delivery system in Place	2	3	3	3	2	2
D4.	Technology Proven	3	3	3	3	3	3
D5.	Market Acceptance of Technology	2	3	3	3	3	3
D6.	Program Design Proven	2	3	3	3	3	3
D7.	Fixed Program Costs	2	3	3	3	2	2
D8.	Variable Program Costs	3	3	2	1	1	1
		SUM X 3:					
	FEASIBILITY TOTAL SCORE:	57	100%	95%	84%	68%	68%
	APPLICABILITY TO SPECIFIC MARKETS- LOW-INCOME HOMEOWNERS(1-4 UNITS)						
E1.	-meets decision criteria	3	3	3	3	2	2
E2.	-durable efficiency gain	2	1	1	3	3	3
E3.	-measures fit housing stock	3	3	3	3	3	3
E4.	-improves appearance/integrity	1	1	1	2	2	2
E5.	-minimum maintenance	2	2	3	3	3	3
E6.	-others don't already provide	2	1	1	1	1	2
		SUM X 3:					
	LOW-INCOME HOMEOWNER SCORE:	39	69%	74%	87%	79%	85%
	LOW-INCOME TENANTS(1-4 UNITS)						
F1.	-meets decision criteria	3	3	3	3	1	1
F2.	-measures fit housing stock	3	3	3	3	3	3
F3.	-minimum maintenance	2	2	3	3	3	3
F4.	-other don't already provide	2	1	1	1	1	2
		SUM X 3:					
	LOW-INCOME TENANT(1-4) SCORE:	30	80%	87%	87%	67%	73%
	MULTIFAMILY HOUSING (5+ UNITS) Low-Income Tenant Programs=						
G1.	-meets decision criteria	3	3	3	3	1	1
G2.	-measure fit housing stock	3	3	3	2	2	2
G3.	-minimum maintenance required	2	2	3	3	3	3
G4.	-others don't already provide	2	2	2	2	2	2
		SUM X 3:					
	MULTIFAMILY TENANT (5+) SCORE:	30	87%	93%	83%	63%	63%
	MULTIFAMILY HOUSING (5+ UNITS) Landlord Programs=						
H1.	-meets decision criteria	3	3	3	3	2	2
H2.	-durable efficiency gain	1	1	1	3	3	3
H3.	-measures fit housing stock	3	3	3	2	2	2
H4.	-improves appearance/integrity	2	1	1	2	2	2
H5.	-minimum maintenance	2	2	3	3	3	3
H6.	-others don't already provide	2	2	2	2	2	2
		SUM X 3:					
	MULTIFAMILY LANDLORD SCORE:	39	74%	79%	82%	74%	74%

Figure 2. Northeast Utilities Low-Income/Special Needs Customer Program Screening Matrix Excerpt - Electric Programs

them using a series of two-stroke commands. An on-line help screen provides ready access to the model commands. These features provide for the systematic input of planning data. The data required for screening is a qualitative interpretation of program and technology attributes as compared to other available technologies. Each program is reviewed individually and in its entirety through the scrolling of the model attribute lists. Extensive knowledge and understanding of the programs and technologies as they relate to the low-income/special needs customer markets is required for qualitative data input. Data for the NU effort was researched and developed by NU staff experienced in helping low-income customers and by consultants who are particularly familiar with these special market options.

		Low Cost Heating System and Envelope:		Major Heating System + Envelope (Weatherization):		
		PROGRAM 1	PROGRAM 2	PROGRAM 3	PROGRAM 4	PROGRAM 5
		100% Incentive Self-	100% Incentive Contractor	100%	< 50%	0% Interest
SUMMARY SCORES:	WEIGHTS	Installed	Installed	Incentive	Incentive	Loan
Utility Values	30%	57%	62%	85%	73%	73%
Customer Values	30%	64%	78%	87%	72%	72%
Community Values	15%	67%	85%	100%	85%	85%
Feasibility	25%	100%	95%	84%	68%	68%
TOTAL VALUES SCORE=	100%	71%	79%	88%	74%	74%
MARKET SCORES PER MARKET SEGMENT:						
Low-Income Homeowner (1-4 units)		69%	74%	87%	79%	85%
Low-Income Tenant (1-4 units)		80%	87%	87%	67%	73%
Low-Income Tenant (5+ units)		87%	93%	83%	63%	63%
Low-Income Landlord (5+ units)		74%	79%	82%	74%	74%
Public Housing Tenant (5+ units)		87%	93%	83%	57%	57%
Public Housing Landlord (5+ units)		78%	84%	86%	55%	63%
TOTAL POSSIBLE SCORE:	100%					
TOTAL SCORES PER MARKET SEGMENT:						
Low-Income Homeowner (1-4 units)		71%	78%	88%	75%	76%
Low-Income Tenant (1-4 units)		73%	80%	87%	72%	73%
Low-Income Tenant (5+ units)		74%	82%	87%	71%	71%
Low-Income Landlord (5+ units)		72%	79%	87%	74%	74%
Public Housing Tenant (5+ units)		74%	82%	87%	70%	70%
Public Housing Landlord (5+ units)		73%	80%	87%	70%	71%
TOTAL POSSIBLE SCORE:	100%					

Figure 3. Northeast Utilities Low-Income/Special Needs Customer Program Screening Summary Scores Excerpt - Electric Programs

RESULTS OF DEMAND MANAGEMENT PROGRAM SCREEN - A NORTHEAST UTILITIES CASE STUDY

Programs

The 21 electric and 14 gas options cover a full range of program offerings . Included are installation programs for every major end use in low-income households as well as education and load management programs. They were not designed to reflect specific NU experience, but

rather, are based on successful utility experience found throughout the country. Furthermore, the program designs are based on principals of administrative simplicity, maximum outreach and one-on-one contact, and use of community resources whenever feasible. Results of the screening ranked by the Total Values Score are shown in Figure 4 for both electric and gas programs. Electric program rankings are briefly described below. The results of the gas program rankings showed similar trends, indicating the consistency of the screening approach.

Top Electricity Programs Ranked By Total Values Score. The top 5 ranking programs after screening exhibit the following characteristics:

- They all involve the installation of energy conservation technologies and represent a mix of end uses (heating, hot water and lighting). Both major and low-cost installations are included. The high ranking of these programs is due to the tangible and reliable cost savings achievable through the use of these technologies for both the customer and utility.

- They are all 100 percent utility paid incentive programs. This reflects the higher likelihood of participation due to the difficulty that is often experienced by the low-income household when dealing with unbudgeted expenses.

- They all involve contractor installation, including the low-cost measure programs. This reflects the increased reliability of the achievable energy savings through professional installation of measures.

- There are no education programs.

- There are no load management programs.

The top 10 ranked options produced a portfolio of utility programs that shows coverage of end uses and different supportive approaches. It includes the following:

- Four programs involving heating system improvements and building envelope measures. Three of these are major measure programs.

- One domestic hot water program.

- Three education programs exhibiting different kinds of contact with customers, each meeting different objectives.

- Two lighting retrofit programs - one targeted for small buildings and the other for large buildings.

Low Ranking Electricity Programs ranked by Total Values Score. The value of the screen in the review of low ranking programs is in that it helps to pinpoint why some options do not meet the defined goals of customer service for these special customers. Review of the 3 load management programs in the screen indicates that they consistently rank in the last 5 or 10 positions based upon the total values criteria. Examination of the values blocks show that load management programs simply do not exhibit the potential for much impact in low-income homes since they have limited potential participation and less effect on overall energy bills than

PROGRAM RANKINGS BY CRITERIA: **TOTAL VALUES**

	PROGRAM: ELECTRIC CUSTOMERS	SCORE
3	Major Heating System & Envelope, 100% Incentive	88%
12	Domestic Hot Water Conservation, 100% Incentive	79%
2	Low Cost Heat. & Envel., 100% Inc., Contractor Install.	79%
6	Major HVAC System Repair & Replacement, 100% Incent.	77%
8	Low Cost Lighting & Other Appliances, 100% Incent.	77%
15	Education- Group Workshops	75%
10	Major Lighting Retrofit, 100% Incentive	75%
14	Education- Individual Counseling	75%
18	Education- Bill Payment Programs	75%
5	Major Heating System & Envelope, 0% Interest Loan	74%
4	Major Heating System & Envelope, 50% Incentive	74%
17	Education- Newsletters & Other Direct Mail	72%
1	Low Cost Heat. & Envel., 100% Incent.,Self-Install.	71%
13	Landlord Appliance Replacement, 100% of Incremental Cost	69%
7	Major HVAC System Repair & Replacement, 50% Incent.	68%
16	Education- Audits	67%
11	Major Lighting Retrofit, 50% Incentive	67%
9	Low Cost Lighting & Other Appliances, 50% Incent.	66%
20	Load Management- Demand Limiters	63%
19	Load Management- DHW Direct Control	61%
21	Load Management- Residential Demand Rates	54%

	PROGRAM: GAS CUSTOMERS	SCORE
3	Major Heating System & Envelope, 100% Incentive	88%
2	Low Cost Heat. & Envel., 100% Inc., Contractor Install.	79%
12	Domestic Hot Water Conservation, 100% Incentive	79%
6	Major HVAC System Repair & Replacement, 100% Incent.	77%
15	Education- Group Workshops	75%
14	Education- Individual Counseling	75%
18	Education- Bill Payment Programs	75%
4	Major Heating System & Envelope, 50% Incentive	74%
5	Major Heating System & Envelope, 0% Interest Loan	74%
17	Education- Newsletters & Other Direct Mail	73%
1	Low Cost Heat. & Envel., 100% Incent.,Self-Install.	72%
7	Major HVAC System Repair & Replacement, 50% Incent.	68%
16	Education- Audits	67%
20	Load Management- Demand Limiters	62%

Figure 4. Northeast Utilities' Low-Income/Special Needs Customer Program Screen Ranking Results

other options. Less than 100 percent incentive programs also rank consistently in the last 10 positions. The hurdle rate for most low-income customers is likely too high and available funds

insufficient to find 50 percent incentives and 0 percent interest loans acceptable for participation. Audits seem to lack customer appeal as well since resultant energy impacts are restricted by available household funds and supplementary action on the part of the customer.

TOP ELECTRICITY CONSERVATION PROGRAMS RANKED BY TOTAL SCORES PER MARKET SEGMENT. The market segment scores are a particularly useful result of the screening process as they indicate the programs that are appropriate for for promotion within each of the 6 low-income market segments. These scores indicate how well programs meet overall constituent objectives, coincide with decision criteria and are compatible with the housing stock for these market segments. These indications are valuable to the utility for the design of the promotional aspects of program planning. Reviewing the top 5 positions in all 6 of the market segments, the following results were obtained:

- With one exception, all top ranking programs within all of the market segments involve the installation of energy conservation technologies. The exception to this list is an educational program that is targeted to each market segment in a unique manner.

- All top ranking programs are 100 percent utility paid incentive programs. This is an intuitively reasonable result as all market segments would likely respond positively to free programs.

- A range of end uses is represented within each market segment: space heating (sometimes space conditioning), hot water and lighting. This is an encouraging result as potentially there could be extensive end use coverage through program offerings for all market segments utilizing the high ranking programs from the screen.

These results are consistent with those that consider Total Values alone. This finding indicates that key programs should be attractive to most of the low-income markets simultaneously. Diversity of programs in each market segment is also an interesting outcome and one that helps to meet the need for coverage within the low-income/special needs market.

USE OF THE RANKED RESULTS AT NU

Through the recent internal pilot evaluation of the low-income/special needs customer program ranked results, NU is reviewing the menu of currently offered programs within these market segments. Since the screen indicated that permanent installation of energy saving measures were of a much higher value to the customer and utility, NU is embarking on the design of a comprehensive retrofit and weatherization program to be offered to many of these market segments at no cost to the participant and is reallocating the funding of the temporary measures budget to this new program. Other programs currently in place and consistent with the screening results are going through a major review for impact and effectiveness of implementation design. Educational programs, once the cornerstone of the low-income customer program menu, will be incorporated into the weatherization and retrofit programs as a behavioral enhancement for the participant since they tended to be of a lesser value to the customer than other options. The load management programs, once thought to be the "next step" in program development for these special customers, will be re-evaluated. From the screen results, any load management initiatives for these customers would be most effective if implemented for very special market segments only, not these customers at large. As all the programs are reviewed, there is a need to introduce the process to the utility regulators and

interested parties for the enhancement and possible use for other low-income program planning (i.e. at the state and municipal levels).

This screening model development and exercise has encouraged NU to re-think the planning process for these special customer segments. What used to be accomplished based solely on Company experience and intuition in program offerings has now evolved into a fair review of many different program and end-use configurations that addresses the unique needs and values of these customers. The development of this process by NU demonstrates that the Company recognizes the benefits, beyond those that are economically derived, of quality customer service to the low-income/special needs segments. The effort has, at the very least, provided a common language between the utility, regulators, interested parties and customers for discussion of future program planning and development. This dialog should yield the offering of programs that make sense for the low-income/special needs customers.

SCREENING MODEL NEXT STEPS

The low-income/special needs customer program screening model has, and will continue to serve, as an important planning tool at NU. As the NU staff and service representatives develop an expertise in the use of the model, it will likely be utilized for the development of an annual demand management plan for residential customers with special needs. The model could easily be adopted for use by other utilities with little process change required. As the utilities nationwide grow in their knowledge of this special customer base, it is hoped that the matrix itself will expand in size as new programs and attributes are identified. The model will also, no doubt, undergo mathematical analysis by utility researchers as they endeavor to understand the magnitude of the attribute and value contribution to total program rankings. The model developers encourage this activity.

Acknowledgements

The authors would like to thank the following individuals who contributed to the model development and paper: Dr. John P. Cagnetta and Mr. Raymond E. Donovan, Northeast Utilities, who both were interested in the prospects for this project and encouraged the refinement of a vague model design, Stephen J. Morgan, Steven E. Ferrey and Charles R. Dunklee for their invaluable input, Nancy Pitblado, Wilson Gonzalez, Wayne Estey, Luisa M. Freeman and Jean Russo for their insightful comments on the paper, and Mary Ann Rossi and Amanda J. Scheyd for their typing and editorial support.