



**COLORADO DEMAND-SIDE MANAGEMENT PROGRAMS
IMPACT, COST-EFFECTIVENESS, PROCESS AND
CUSTOMER SATISFACTION EVALUATIONS**

FINAL REPORT

Prepared for:

Xcel Energy

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EXECUTIVE SUMMARY

This report presents the results of impact, process, customer satisfaction, and cost-effectiveness evaluations of Xcel Energy's (the Company's) Colorado Demand-Side Management (DSM) programs. The evaluations were conducted by Summit Blue Consulting, LLC (Summit Blue) in late 2005 and early 2006. The primary purposes of the evaluations, which analyzed each Colorado DSM program's structure and projects installed during the Resource Acquisition Period ending December 31, 2005, included:

- Analyzing the energy and demand savings achieved by the programs.
- Evaluating the programs' overall cost-effectiveness as determined using the Total Resource Cost (TRC) test.¹
- Investigating each program's design and implementation characteristics to identify key programmatic aspects that helped contribute to its success, as well as those aspects that could be modified in future programs to increase program effectiveness.
- Assessing customer satisfaction with the program services.

This executive summary is organized similarly to the main body of the report. The results of the impact and cost-effectiveness analysis are presented first, followed by key findings and observations from the process evaluation, and finishing with a series of conclusions and recommendations.

ES.1 Summary of Findings from the Impact and Cost-Effectiveness Evaluation

Exhibit ES-1 presents the reported net coincident generator peak demand savings of the DSM programs. For comparison purposes, the table includes the savings attributed to the Company's Bid 2001 program and the residential and business Saver's Switch[®] programs which were not included in this impact analysis.^{2,3}

¹ The TRC test was evaluated as defined in the *California Standard Practice Manual: Economic Analysis of Demand Side Programs and Projects, October 2001* prepared for the California Public Utilities Commission and the California Energy Commission.

² The Bid 2001 program was evaluated in 2003 and the savings numbers for the program have been verified and reported to the Colorado Public Utilities Commission. As discussed later in this report, conversations with Xcel Energy staff during the July 2005 project initiation meeting indicated that the work effort focused on the Residential and Business Sector Saver's Switch programs should be limited to a review of prior approaches used by Xcel Energy to develop estimates of program impacts.

³ The Bid 2001 program was started under the 1996 Settlement and Stipulation Agreement and expanded in 2000 via the 1999 Settlement and Stipulation Agreement. The total measured and verified savings for the Bid 2001 Program was 14,575 kW; of which 1,236 kW was attributed to the 1996 Settlement and Stipulation Agreement. The balance (13,339 kW) as shown in this report is only the amount attributed to the 1999 Settlement and Stipulation Agreement.

ES.1.1 Program Impacts

Exhibit ES-1. Reported Net Coincident Generator Peak Demand Savings (MW)

Program	2001	2002	2003	2004	2005	Total
Residential Programs						
Central AC Program	0.68	4.13	3.97	5.71	5.69	20.18
Evaporative Cooling Program			0.02	1.77	1.70	3.48
Saver's Switch*	0.31	3.76	11.80	22.99	16.69	55.55
Commercial & Industrial Programs						
Bid 2001*	2.66	7.14	3.54			13.34
Custom Efficiency Bid Program		0.54	4.30	7.57	7.43	19.83
Energy Design Assistance Program			0.02	1.44	3.93	5.39
Recommissioning Program		0.17	1.22	2.26	4.94	8.59
Saver's Switch*	0.20	0.57	1.22	0.38		2.37
Total Savings	3.86	16.31	26.08	42.12	40.38	128.74

* These programs were not included in the impact analysis for this project.

Exhibit ES-2 presents the verified net coincident generator peak demand savings by year determined by this evaluation. The savings values for the Bid 2001 and Saver's Switch programs as determined from other evaluation efforts are incorporated into the achievements presented in the following exhibit.

Exhibit ES-2. Verified Net Coincident Generator Peak Demand Savings (MW)

Program	2001	2002	2003	2004	2005	Total
Residential Programs						
Central AC Program	0.70	2.87	3.07	3.88	3.55	14.07
Evaporative Cooling Program			0.01	4.14	3.82	7.97
Saver's Switch*	0.31	3.76	11.80	22.99	16.69	55.55
Commercial & Industrial Programs						
Bid 2001*	2.66	7.14	3.54			13.34
Custom Efficiency Bid Program		0.50	3.87	7.41	8.92	20.70
Energy Design Assistance Program		0.05	1.57	2.95	1.23	5.80
Recommissioning Program		0.29	0.80	0.77	5.17	7.04
Saver's Switch*	0.20	0.57	1.22	0.38		2.37
Total Savings	3.87	15.18	25.88	42.52	39.38	126.84

* These programs were not included in the impact analysis for this project.

The results of the net-to-gross analysis are presented in Exhibit ES-3. The net-to-gross adjustment factors were based on the results of the process evaluation efforts and were obtained by combining the market effects of free-ridership and spillover.

Exhibit ES-3. Net-to-gross values for residential and commercial programs

Program	AC	EC	CE	EDA	RCx
Free-ridership Component	39.0%	56.5%	37.4%	29.6%	23.5%
Spillover Component	8.1%	16.2%	10.05%	7.71%	6.56%
Net-to-gross ratio	69.1%	59.7%	72.7%	78.1%	83.1%

ES.1.2 Cost Effectiveness

The total resource cost (TRC) test was used to assess the cost-effectiveness of this program. The TRC test compared the avoided cost of electricity saved to the cost of program administration, including participant installation costs. The findings are based on net program achievements, that is achievements that are directly attributable to the program and are net of free-ridership. The results of this analysis are presented in Exhibit ES-4 for all programs.

Exhibit ES-4. Benefit/Cost Analysis Summary

Program	NPV of Benefits	NPV of Costs	BCR
Residential AC	\$23,938,817	\$16,346,170	1.46
Residential Evaporative Cooling	\$9,691,735	\$7,438,082	1.30
Custom Efficiency	\$67,509,792	\$32,530,705	2.08
Energy Design Assistance	\$16,466,903	\$4,879,771	3.37
Recommissioning	\$8,725,592	\$4,061,536	2.15
Residential Saver’s Switch	\$42,927,676	\$22,692,424	1.89
Business Saver’s Switch ⁴	\$1,942,690	\$2,677,310	0.73
Total	\$171,203,205	\$90,625,998	1.89

On average, commercial programs (excluding Business Saver’s Switch) yielded a benefit-cost ratio of 2.23 versus a value of 1.41 for residential programs (excluding Residential Saver’s Switch).

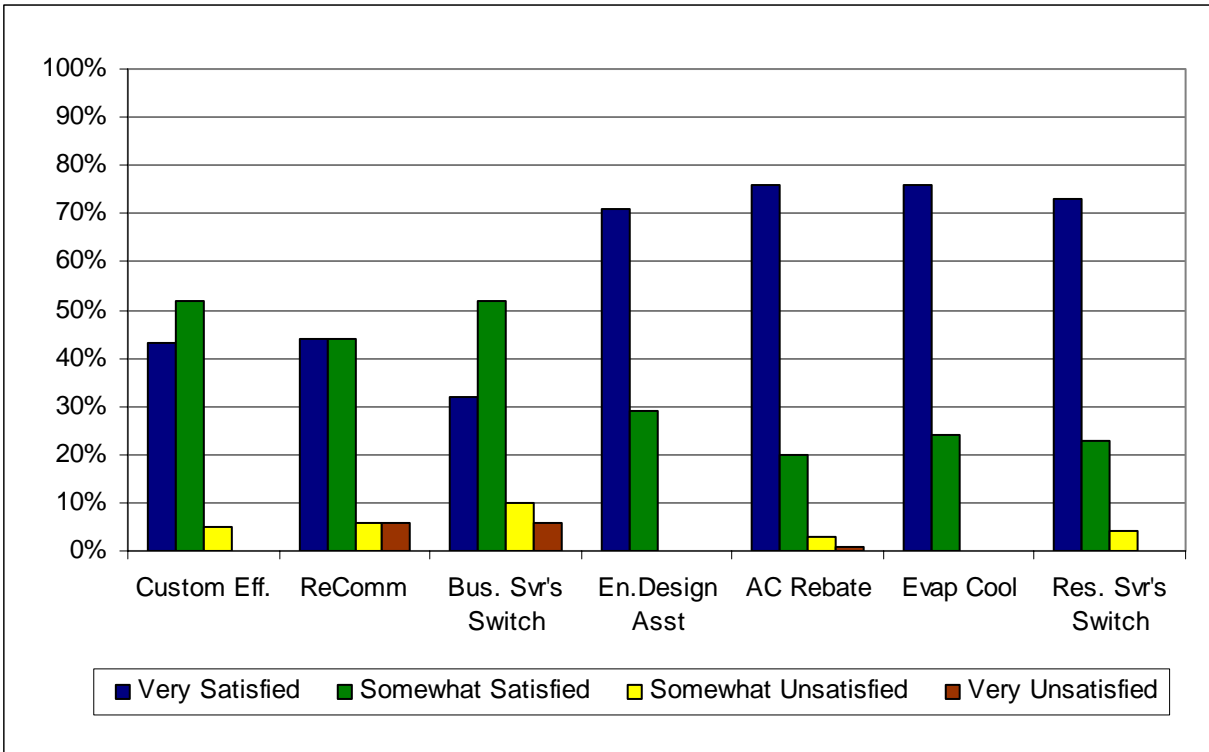
ES.2 Summary of Findings from the Process and Customer Satisfaction Evaluation

In general, **customers were highly satisfied with all seven of the programs** evaluated. In four of the programs the percentage of “Very Satisfied” customers was even higher than the percentage stating they were “Somewhat Satisfied.” There were very few percentages of either “Somewhat Dissatisfied” or “Very Dissatisfied” customers, and indeed in only three of the seven programs evaluated were there any

⁴ The Business Saver’s Switch program was not promoted in 2004 and not offered in 2005 due in large part to the lower than expected kW/ton savings estimates associated with program participants.

customers who said they were “Very Dissatisfied.” Only the Business Saver’s Switch program had more than 10% of participants who expressed any dissatisfaction at all. See Exhibit ES-5.

Exhibit ES-5. Overall Program Satisfaction⁵



Some of the likely reasons for these high satisfaction ratings, from analysis of the surveys of program participants, include good marketing approaches that provide useful information, well-run program processes, appropriate recommendations for energy efficiency actions, and suitable incentives.

There were some weak areas discovered, though the generally high overall quality of the programs tended to mitigate the weaknesses. Some program participants felt marketing and information could be improved to be less confusing or provide more information on how the program works (Saver’s Switch being notable), that incentive payments could be more timely, and that in some cases customers believe they would have done some program-recommended actions anyway. Again, however, such weaknesses were cited by small minorities of survey respondents.

⁵ Chart percentages, sample sizes and population base:

	<u>BUSINESS PROGRAM</u>				<u>RESIDENTIAL PROGRAM</u>		
	Custom Eff.	ReComm	Bus. Svr's Switch	En.Design Asst	AC Rebate	Evap Cool	Res. Svr's Switch
Very Satisfied	43%	44%	32%	71%	76%	76%	73%
Somewhat Satisfied	52%	44%	52%	29%	20%	24%	23%
Somewhat Unsatisfied	5%	6%	10%		3%		4%
Very Unsatisfied		6%	6%		1%		
Sample Size	21	16	70	7	71	71	71
Population Base	104	50	839	20	4,394	2,449	49,995

Both residential and business non-participants in the last two years or so have changed some aspects of their energy lifestyle or business operations in various ways more than participants have for the same actions. Whether this is because there are program spillover effects to non-participants, that participants already had increased such behaviors, or some other dynamic, was not readily apparent from the research data.

Various trades including air conditioning dealers and contractors (for the Air Conditioning Rebate and Evaporative Cooling programs), building design teams (for the Energy Design Assistance program), and service providers for the Recommissioning program, all expressed satisfaction with the programs they have been associated with. Vendors generally thought Xcel Energy's program strategies are sound, that Xcel Energy and its program administrator Nexant have marketed the programs well, that incentives and vendor support are good.

Vendors cited few concerns, primarily along the lines of program refinements (rather than wholesale changes to any of the programs) **though program continuity is a basic concern**. Potential refinements include reviewing technical reports issued to customers or vendors by the program, refining incentives, and adding marketing efforts in some areas.

Program staff all showed a thorough understanding of their programs. Their assessment of the programs' strengths and weaknesses was articulate and frank, reflecting not only their understanding of the programs but a sound commitment to making the program run smoothly and successfully. Their **focus on meeting program goals and staying within budgets was consistently their top priority**, as reflected by the interviews conducted with them. None of them hesitated to point out areas of concern and opportunities for improvement, though in the context of the programs' design as given (i.e., not considering any fundamental changes), **there were relatively few program process weaknesses**.

Program staff are pleased with having accomplished the program goals within budget. They believe **the marketing effort has gone well** for the most part, though some improvements or changes should be considered. Program **administrative processes appear to be in good shape**, though again there are a few areas to consider working on improvements. Xcel Energy staff are pleased with the work done by the program administration and delivery contractors in running the various programs on Xcel Energy's behalf. Conversely, the program administration and delivery contractors consider Xcel Energy to be a "great client," whose staff are knowledgeable, are focused on the right issues and priorities, do not micromanage and have allowed the program administration and delivery contractors reasonable flexibility to perform their jobs.

ES.3 Summary of Conclusions and Recommendations

A number of conclusions and recommendations were identified from the research effort. These are outlined below, and discussed in greater detail in Section 4.

ES.3.1 Program Impact and Cost-Benefit Conclusions

At the program market sector level, freeridership for residential programs was, on average, more than 50% higher than FR for C&I programs (47.8% vs. 30.1%). This may be due, in part, to the more extensive involvement of the service providers and technical assistance offered by the C&I programs.

Air Conditioning Rebate

- It is likely that Xcel Energy's Air Conditioning Rebate program helped stimulate the market for SEER 13 equipment. The net-to-gross analysis of the program included an adjustment to

freeridership estimates based on the observation that most vendors have seen a noticeable increase in the percentage of total sales going to program-eligible AC units in the past couple years, especially among residential customers.

- It was observed that the program likely resulted in changes in inventory practices for vendors who do not actively promote the program, but have benefited from increased requests from customers for program approved equipment. The evaluation team applied a non-participating vendor spillover component to account for the observation that many customers were aware of the program, and it is likely that this has influenced all vendors in the service territory to provide the high efficiency equipment.
- The AC Rebate Program received almost 38,000 applications over a five year period, and of these 94% completed the process and were paid their rebate.
- 658 contractors participated in the program, and the number of jobs per contractor was spread fairly evenly over the group.
- A small percentage of the participants (2%) did a sizing calculation so that their new unit was properly sized for the building, and they received an extra \$25 rebate.
- As the program was so large, there was a lot of data to keep track of in managing the program. This was done well in general, with anomalies being only a small percentage of the data. However, there was a significant discrepancy between the database and the reported savings figures in 2002.
- The savings calculations were revised by Summit Blue as we determined that the program had assumed too high of a gain in efficiency due to the TXV technology and proper sizing.

Evaporative Cooling

- The Evaporative Cooling Rebate Program processed 6,313 applications from 2003-2005, and only 1 in 20 (5%) processed applications were rejected.
- Over 90% of all installed evaporative coolers were in the size range of 3,000-5,999 Industry Standard CFM.
- In general, the program administrator kept well-documented databases of program applications. Some issues include:
 - Data for motor HP was missing for more than half of the participating units.
 - No data existed for previously-installed system.
- The savings calculation did not include evaporative cooler motor efficiency or air-conditioner load factor.
- The EC program has likely influenced an increase in the stocking of program approved equipment at several area retailers. Process analysis observations conclude that dealer participation in the EC program was extensive, comprising 115 dealers and retailers. Among participating retailers was Home Depot, which became an active promoter of the program, accounting for a majority of total units sold to program participants. Based on this observation, a

spillover component was added to the EC evaluation to account for changes in retailer inventory practices that likely resulted in sales to customer who did not participate in the program.

Custom Efficiency

- Of the 784 submitted project bids for the Custom Efficiency Program between 2001 and 2005, 663 were approved and completed by the bidder for a completion percentage of 85%.
- Of the four primary measure categories (Lighting Controls, Lighting Retrofits, Mechanical, and Load Shifting), Lighting Retrofits made up more than three-quarters (77%) of the completed projects.
- More than one-third (34%) of all completed projects occurred in the ‘Office’ market sector.
- The M&V reports for the mechanical measures were generally well-documented in terms of savings methodology, but had very little basic project information such as building type and operations.
- The savings figures were deemed to be very accurate due to the use of metering at the site before and after many mechanical and lighting installations.

Energy Design Assistance

- The freeridership analysis of the EDA program included a factor to account for measures that may have been lost through ‘value engineering’ without the technical assistance of the program. Measures considered to be at risk of elimination through ‘value engineering’ that is generally practiced in the design of new buildings constitute about 46% of demand savings achieved by the program.

Recommissioning

- Approximately 93% of RCx measures would likely not have been identified without the technical assistance offered by the recommissioning service providers employed by the RCx program. This observation was included as a component in the freeridership analysis of the RCx program.
- There were a total of 70 project starts from 2002-2005, and 62 were completed for a completion percentage of 89%.
- The program administrator calculated demand savings in two ways – one as an ‘average’ value and one as a ‘peak’ value. For reporting purposes, a scalability factor was applied to the average values and added to the peak values.
- Verified Net Generator demand savings were 7,040 kW as compared to the reported value of 8,594 kW for a realization rate of 82%.

Saver’s Switch

The review of the third party conducted evaluations of Xcel Energy’s Savers Switch programs concluded the following:

- The Saver’s Switch program evaluations utilize procedures and processes that are well established in the industry. In several areas, Xcel Energy’s evaluations go beyond standard practice. These areas include: 1) the assessment of signal reception; and, 2) the inspection of individual load shapes for each control event to look for free riders, uncontrolled participants, and contributing participants.
- Overall, the processes and procedures used in Xcel Energy’s Saver’s Switch impact evaluations are representative of standard industry practices, and exceed these practices in several respects. The estimates of load relief from the Saver’s Switch program on peak days are reliable within the statistical limits clearly stated in the Impact Evaluation Report.

Cost-Effectiveness Conclusions

All programs were cost-effective per the TRC test (a benefit cost ratio in excess of 1.0) with the exception of the Business Savers Switch program. On average, commercial programs (excluding Business Saver’s Switch) yielded a benefit-cost ratio of 2.23 versus a value of 1.41 for residential programs (excluding Residential Saver’s Switch).

A sensitivity analysis of the total resource cost test was conducted using a $\pm 10\%$ variation in the NTG ratio. All programs remained cost effective at this level of variation, though the benefit/cost ratios for AC, EDA, and RCx programs proved more sensitive to this analysis than the EC and CE programs, showing an average variance of $\pm 2.5\%$.

ES.3.2 Program Impact Recommendations

Overall

- ***Use an integrated data collection approach for evaluations of future programs.*** Future program designs should consider including data collection protocols that can be integrated with program implementation to facilitate ongoing and near real-time data collection for assessment and evaluation. These protocols, termed Integrated Data Collection (IDC) garner participant feedback in near real-time on many evaluation topics including market characterization, program progress/success, participant satisfaction, and attribution/causality. The benefits of using an IDC approach on future Xcel Energy residential and C&I program offerings include;
 - ***More Reliable Attribution Data*** - The IDC approach directly addresses the important “recall” issue typically confronted by market characterization and attribution assessments. Recall issues arise when a lag occurs between when a participant interacts with the program, and when the program solicits data from those participants. As expected, the extent of the time lag can effect both participant perceptions of the program and changes in the market.

- ***Real-Time Attribution Data Feed into Proactive Program Management*** - IDC can be highly integrated with program implementation and management. Evaluation plans, approaches, and preliminary and final results can be shared with program staff on a regular basis. Once Xcel Energy staff and implementation contractors provide feedback on the approaches and their needs, evaluators can provide information and feedback from the field to staff as quickly. This feedback loop, from evaluators to staff, can be improved by the IDC efforts because more information is available on an ongoing basis, and staff does not have to wait until the end of a two-year evaluation cycle to see how their program benefits and initial net-to-gross ratio estimates may have changed.
- ***Longevity*** - One of the attractive aspects of the IDC approach is the potential for the longevity of this mechanism for evaluating programs. The IDC efforts can be designed with simplicity in mind so that the process carries on in the future, with minimal staff time and effort, even with different evaluation contractors. Much of the time and effort for an IDC approach occurs early in program design, and once established it is routine and resource requirements should be low.
- ***Potential for Greater Depth of Data Set*** - Many IDC evaluations involve obtaining a matched set of information. That is, both upstream, mid-market actor, and end-use customers respond similar surveys at each stage of a project. With information on the same project from all market actors, evaluators can do more with the data in terms of identifying inconsistencies, determining key influences, and addressing the true level of savings that are due to the program interventions. Many IDC plans employ a pre- and post-project survey approach which also adds depth to the data.
- ***Cost Savings*** - The last key benefit of the IDC approach is cost savings. Most of the IDC surveys can be administered by mail, which has definite cost advantages over phone surveying. When IDC objectives are included early in the program design process, program staff can modify their applications and solicitations so that mailing the survey is completely avoided. Modification of applications and solicitations is a highly-desired outcome of this effort since it would result in a 100% response rate. Cost savings also accrue by avoiding all of the challenging issues associated with phone surveys occurring some time after the project is complete (*e.g.*, employee turnover, recall issues meaning that a highly skilled interviewer must spend time refreshing respondents on what was done under the program, etc.).
- ***Increase the resolution of data collected.*** Additional data collected during program operation could benefit program design efforts and increase the accuracy of future evaluations. For example the recommissioning program could have provided a method to clearly document what measure categories were being installed through the program, such as air handling unit measures, unitary system controls, etc. While not all measures can be categorized, the vast majority can and this would allow for a clearer view of which types of measures and systems are being impacted by the program. The evaluation contractor did identify technology categories, however this process required interpretation and the error inherent in interpretation could be minimized with increased resolution of data collected during program operations.
- ***Provide a more consistent terminology for reporting marketing and net generator demand savings across programs.*** It was observed that the terminology used to define demand savings components varied between several programs. This posed several challenges for the evaluation

team because the evaluation includes a portfolio-level view that requires standard definitions of certain capacity measures between programs. There is no technical reason why more consistent terminology cannot be used in future program portfolio designs.

Programs

Air Conditioning

- As this program is so large, were it to be continued we recommend that the database be reviewed regularly for irregularities, possibly by a third party, so that the correct savings values are reported each year.
- Proper sizing can improve demand savings considerably, so this aspect of the program could be promoted more aggressively.
- Improved duct insulation and/or duct sealing would also lead to much greater savings when an AC system is being replaced, and this could be added to the program with an extra incentive.
- As the Federal minimum SEER for new residential AC will be changing this year, we assume that the program administrators will be reviewing the minimum SEER level for participation in the program. This new federal minimum may mean that other aspects of the program, such as sizing, become more important in the future.

Evaporative Cooling

- Include evaporative cooler motor efficiency and air-conditioner load factor in the savings calculation.
- Attempt to gather data for the previous-installed system. This could be as simple as including a question on the program application to this effect. This data will better help designate a baseline on a project basis, which is important due to the complex nature of baselines for evaporative cooler programs.
- Keep better track of evaporative cooler motor HP so that savings can more accurately be determined.

Custom Efficiency

- Greater savings might be achieved by mandating that lighting retrofits also include lighting controls such as motion sensors, so that lights are not left on when not needed.
- Over 50% of savings were for projects done in the last bid cycle, which indicates that the program got off to a slow start. Program administration could be easier if the projects are more evenly spread out over time.
- There was a lack of information about the buildings in which the installations were done, so a detailed market sector definition for the building should be included in the program database. Future programs that are likely to have broad and diverse participation similar to the CE program would benefit through the use of integrated data collection and increased resolution of data collected at the project level, as noted in the Overarching Impact Evaluation Conclusions and Recommendations.

Energy Design Assistance

- No specific impact-related recommendations are offered.

Recommissioning

- Standardize the way in which demand savings are tracked. M&V procedures for some measures may lead to average savings, but these should be translated into a peak value on a measure/project basis for tracking.
- The measure-level database should be updated to include ‘verified savings’ from the program administrator’s standpoint.
- The terminology for commissioning work, in general, should be clarified with appropriate definitions applied to various program projects. General ‘commissioning’ type work generally falls within 3 categories:
 - Commissioning; this implies a new building or major addition that has not previously been commissioned for energy efficient operation.
 - Retro-commissioning; this implies an existing, operating building that has not previously been commissioned for energy efficient operation and is being commissioned for the first time.
 - Recommissioning; this implies an existing, operating building that has been either been commissioned or retro-commissioned for energy efficient operation and is being reviewed and adjusted after some elapsed operating period.

Many of the projects completed in this program were in fact retro-commissioning efforts. Facilities that have indeed been commissioned prior to the program intervention should be noted, as these impacts freeridership estimates and also can provide valuable baseline data.

Saver’s Switch

There are no specific recommendations for changing the methods used; however, some thought might be given to the following items by the Saver’s Switch evaluation team at Xcel Energy:

- A sample size of 30 is used for each participant group – the standard switch participants and the smart switch participants. This total sample size of 60 is well within the acceptable range for evaluation of these direct load control programs. The use of a larger sample size represents a trade-off – higher evaluation costs in return for what will likely be more precise estimates. While not recommending that the sample size should be increased, considering this trade-off is part of any good evaluation planning process.
- The relationship between air conditioning loads and weather is used to forecast the load relief at for range of time and temperature combinations. This is done by regressing load impacts on different weather-related variables. The prior evaluations used contemporaneous weather variables in these equations. Other direct load control impact evaluations have used, in addition to contemporaneous weather variables, lagged weather variables, i.e., weather from preceding hours and even preceding days. The weather in the hours preceding a given hour can affect heat buildup in structures and can also influence occupant behavior. As a result, it may be a good idea

to test some lagged weather variables in the regression equation used for forecasting. Again, this is not a recommendation per se, but it is a suggestion that can be tested in future evaluation efforts.

ES.3.3 Program Process and Satisfaction Conclusions

Overall

Overall, it may be concluded that the programs evaluated satisfied customers and reflected well-developed administrative, marketing and other processes. Key points are as follows:

- Xcel Energy has conducted the evaluated programs effectively from a customer satisfaction and process perspective.
- Customer satisfaction overall is very high, and process concerns were relatively minor.
- Assuming no major changes in program budgets or staffing, the programs have worked to nearly the maximum they can to capture the achievable market potential.
- It remains uncertain whether the underlying goals of the programs can realistically be increased without concomitant increases in staffing or budgets. It is unlikely that the programs that continue into the future could be made much more satisfactory to customers, or that the processes could be made significantly more efficient (and so more cost-effective) such that the program goals could be raised accordingly without substantial increases in program resources.
- The Company appears to have the knowledge and experience to conduct programs such as those evaluated here in ways that will maximize process efficiencies and customer satisfaction.
- Program staff seem to have a good understanding of the various programs' successes and failures, and the issues in play with their programs. They know what customers' and supporting vendors' concerns are, and have worked to minimize problems and build on successes.
- If program staff continuity is maintained and institutional knowledge is adequately passed along to future program generations – including provision of sufficient financial and staff resources – Xcel Energy has the capability to continue and further improve upon the results shown in this evaluation.
- On the program level, Residential customers who have not been participating in programs have fairly good awareness of broad DSM options such as Energy Star® appliances, CFLs and such. They have mixed awareness of Xcel Energy's residential DSM programs, however, which appears to be related to the level of marketing investment that has taken place.
- Residential non-participant customers say they would participate in programs for a variety of reasons that are the same as participants' reasons for participating, though no one reason dominates customers' thoughts.
- Non-participating residential customers seek energy information from a variety of sources, but primarily their utility and consumer organizations. They value a source because it provides accurate information, because they trust the source and because it helps them track and reduce energy costs.

- Business customers see a variety of reasons to participate in DSM programs, but it is clear their top reason is to save money in various ways. They seek information from a variety of sources and, as residential customers do, value the trust of the information source and the accuracy of the information.
- Business-segment non-participants have a more mixed awareness of broad DSM options than their residential counterparts, showing a slightly lower awareness of load management price discounts and energy management systems.
- Business-segment non-participants have a somewhat low awareness of Xcel Energy's DSM programs for businesses.
- The Air Conditioning Rebate and Evaporative Cooling programs greatly benefited from the dealer networking effort, whereby dealers contributed significantly to program marketing. Dealers benefited greatly from the program update communications effort that supported their co-marketing efforts.
- Incentives that cover a significant portion of high-efficiency equipment cost increments can have a significant impact on the share of equipment sold that is high-efficiency. Information-only programs or those having only modest incentives may not have nearly as much impact as when incentives are substantial enough to get attention from vendors and customers alike.
- Special-promotion tactics can have a noticeable effect on program participation, such as limited-time offers that, ironically, were effective in the context of a program like the Air Conditioning Rebate program being discontinued, and the resulting push by dealers to garner additional business before the "offer" expired.
- Administrative consolidation of program processes for similar types of programs makes sense, as has been done for the Saver's Switch® program, or for the Air Conditioning Rebate and Evaporative Cooling programs, were they to be continued.

Programs

Air Conditioning Rebate

- There is not a great deal to conclude for this program in terms of considering potential improvements going forward, as the program has been discontinued. Customers have been satisfied with the program.
- There are potential lessons for other programs, however, to conclude from this program. One is the extensive dealer network that was developed and the experience gained in how to effectively manage relationships with the trade network.
- A second lesson is the fax correspondence process the program hit upon as an efficient, timely and dealer-friendly way to keep the network apprised of program developments.
- A third lesson is that incentives that cover a significant portion of high-efficiency equipment cost increments can have a significant impact on the share of equipment sold that is high-efficiency.
- There is an underlying psychological dynamic at work that may be useful in other program efforts. That dynamic is the motivational power of offering temporary "carrots" – either monetary

bonus incentives or some sort of in-kind bonus incentives to dealers and customers as part of a program's marketing strategy.

Evaporative Cooling

- The program has improved its performance since being revised and with the successful inclusion of a large home improvement retailer. Customers are very satisfied, having participated to save money, primarily.
- The Evaporative Cooling program also benefited from having an active vendor network.
- There is a need for some sort of pre-installation baseline measurement prior to unit installations.
- The minimum efficiency level of 2,500 CFM may be too low and could be resulting in some free-ridership in the program, based on vendor comments.

Custom Efficiency

- The program appears to have satisfied customers.
- The program, while successful within its defined goals, appears to be less preferable than a prescriptive or custom-type program structure that does not have a bidding component.
- Third-party bidders present a challenge in that they do not directly represent Xcel Energy, tend to "game" the bidding system, and may or may not be sufficiently proactive in their marketing efforts – thus causing uncertainty in achieving the program goals.

Energy Design Assistance

- The program has satisfied customers who participated in it.
- The program appears to be gaining momentum in the design community, though most of its influence has been in the Denver area.
- The program has greater potential than it has been able to tap so far.
- Additional marketing efforts may help expand program participation, including direct marketing by Xcel Energy as well as expanded trade relations efforts by the design support contractor.
- The incentive structure has been challenging for customers and design teams to understand, and some concern exists that the incentive structure and its application in the program is overly rigid.
- The level of paperwork and associated design team effort is of concern to some design teams, and the technical reports for some are not easy to understand.
- The program measurement and verification process, while burdensome to some design teams, appears to be worthwhile as a means to assure quality.

Recommissioning

- The program concept has been well-received by service providers.

- The program appears to be suffering somewhat from an ignorant market and service providers who are still learning the program process. The program suffered early on due to the economic conditions following the events of 9/11.
- The program's processes appear to be in good order.

Saver's Switch

- The program's incentive structure appears to be too much "all or nothing," and the program could benefit from changing the incentive structure.
- The mix of communication and control technologies used in the program presents an inventory and logistical challenge.
- The switch installation time is reasonable, but could perhaps be reduced somewhat.
- The program retention rate is somewhat lower than desired, perhaps due to the incentive structure or the program still maturing and not having "shaken out" marginal customers.

ES.3.4 Program Process and Satisfaction Recommendations

Several recommendations suggest themselves from the conclusions about the programs' process and satisfaction.

Overall

- Xcel Energy should continue to recognize its deep institutional experience with demand-side management programs. In particular, Xcel Energy should strive to ensure continuity in the Company's program staff and institutional knowledge so that the successes achieved in programs historically continue to be built upon. Doing so will help maximize the programs' cost-effectiveness as well as achieve greater participation in the long term.
- Xcel Energy management should continue to overtly support the program effort in the context of the Company's overall business strategy to build customer satisfaction and loyalty.
- Move quickly and aggressively to re-establish momentum in the markets being most affected by the portfolio transition in Colorado.
- Continue working to expand relationships with various trades and explore ways to expand trade ally involvement in programs.
- Maintain a strong brand presence through continued and, in some programs expanded marketing efforts. Customers have a good image of Xcel Energy as an energy service provider and a credible information source, which is difficult to rebuild if lost.
- Continue working to improve information systems and program administrative processes, to improve monthly program participation forecasts' accuracy, and to spend less time on them so that program staff can focus more on program marketing, in particular building internal and external program relationships with other Xcel Energy staff, supporting trades, communities and other program stakeholders. One such improvement for vendors and customers is making application forms available on-line.

- General awareness building for programs should utilize a variety of cost, altruistic and other types of messages.
- Customers look for information from a variety of sources, so Xcel Energy should maintain a comprehensive view in disseminating information.
- Consider expanding the overall marketing effort to business customers in Colorado, to raise the relatively low level of program awareness those customers currently have.

Program Process and Satisfaction Recommendations

Air Conditioning Rebate

- No specific recommendations are offered for this now-discontinued program.
- Xcel Energy should, however, continue to monitor the market this program has served and the technologies available, to assess the value of again offering some form of program in the future.

Evaporative Cooling

- Consider obtaining additional information about target markets such as demographics, buying habits, equipment saturation to support program continuation going forward. Targeted ongoing market research in support of these information needs may be valuable to managing the program going forward, particularly for planning future program goals and budgets.
- Continue utilizing what appears to be a very cost-effective newsprint advertising strategy.
- Consider a spot-basis pre-installation baseline measurement process for this program, to assure quality and support impact measurement.
- Consider reviewing the 2,500 cfm efficiency level to determine whether it should be raised to some extent and so reduce the potential for free ridership.

Saver's Switch

- Consider reviewing the program process and Xcel Energy's internal tools and data systems so that monthly Saver's Switch participation forecasts' accuracy can be improved, and less time spent on them.
- Consider providing resources to perform customer surveys on the program enrollment and control day processes. While this evaluation has helped in that regard, a more frequent schedule of doing this may be valuable.
- Change the incentive structure to align with the program's summer orientation and month-to-month operation. A 15% monthly bill credit concept appears to be sound and aligning the incentive more closely with the control season makes sense so that customers see their reward quickly.
- Continue working with the switch installation contractor to shorten the time it takes to install switches, not only to assure timely availability for the control season but also to demonstrate program responsiveness to customers.

- Continue to give the program time to stabilize with those customers willing to stick with it over the long term, letting go those having less resolve to participate and to avoid alienating them from potential participation in other programs where they may provide better quality participation.
- Consider a technical and load research effort to better understand the reasons for Business Saver's Switch impacts being lower than have been seen. While this may seem to be more an impact-related recommendation than a process recommendation, there is a critical process issue addressed in this recommendation. That process issue is that Xcel Energy needs, broadly, to maintain a level of technical and load research capability that will effectively support the program's development, measurement and evaluation needs, to assure technical credibility before regulators and other stakeholders – especially customers – when the program is being reviewed for continuation and to ensure it evolves positively over time

Custom Efficiency

- Support program staff's efforts to keep up to date on optimal ways to operate DSM bidding programs, if such are to be considered in the future. Program realization rates are considered key intelligence by program staff.
- While this program is discontinued, any replacement program should be provided sufficient resources, both in evaluations and in the course of program operations, to address this issue.

Energy Design Assistance

- Consider a limited expansion of the program and also consider expanding marketing efforts in some way.
- Strive to expand geographically more beyond the Denver area.
- Consider expanding the market reach of the program, perhaps on a probationary basis, for example by adding one or two other design review consultants who would be willing to utilize the key aspects of the advisory process used by the current design support contractor. This should be done in such a way as to maximize the effectiveness of the current program process and relationship techniques, perhaps with the current design support contractor acting as a sort of franchise agent.
- Consider some expansion of the program's marketing efforts, with a view to the longer term, in relation to general building cycles, and through increased customer relationship development among A/E firms, developers and large customer facilities management staff. Providing account managers with more substantial incentives to pursue project opportunities and spend more time selling to customers may help accomplish this.
- Consider ways to bring the EDA concept to smaller buildings, as difficult as that will be. There may be prescriptively based EDA approaches that could be promoted to developers and "cinder-block" builders which could be developed and piloted.
- Provide a little greater flexibility in what customers are allowed to do with their building designs and how the program incentives are determined for a given project. For example, reduce the incentive levels slightly or, as program staff suggested, by having some sort of kWh/kW split in the incentive formula. Whatever alternative incentive structure is developed, it has to be simple to communicate to customers.

- Pay closer attention to seemingly small administrative improvements that mean a lot to customers, such as addressing the invoicing issue that was raised, and also working on improving the timing of incentive payments to customers.
- Consider reviewing the technical reports the design support contractor produces for customer design teams' use, to see if there are ways to better present the information to customers so they more readily understand it, to ensure that measures being recommended indeed are having their impacts accurately estimated and costed – all with a view to improving the program's credibility to the more skeptical design firms and customers.

Recommissioning

- Consider strengthening service provider training and cooperative marketing efforts with service providers. Doing so may better assure proper alignment of providers' services with the program's objectives, branding, marketing and technical needs.
- Speeding up recommissioning study report production is an admirable goal from a customer service perspective, and should be pursued where it can be done without compromising the integrity of the report and its underlying data and technical analysis. For a relatively embryonic program like this, however, it is equally important to get the information right and assure credibility to customers. Thus, report timing performance should consider what it takes to produce a quality report and allow for additional time to ensure a good analysis and a persuasive presentation. Also, consider additional standardization of reports, to help expedite their production.
- Work to expedite service provider payments, not only in recognition of provider cash flow concerns but also to demonstrate the importance of timely program processes.
- Review the procedures for critiquing service provider reports, to ensure a consistent review process.
- Consider the suggestions made by service providers to revise the method for estimating recommissioning study costs, and refine the cost estimation process accordingly if the assessment shows potential for improving study cost estimation.
- More broadly, consider bolstering support and service provider payments for the planning phase of recommissioning projects.
- Consider reviewing the measurement and verification process, with an eye to bolstering the measurement aspect of the process. Be mindful, however, of the concern that the cost of the M&V process was felt by some providers to have been under-compensated, so there is likely a significant trade-off involved between more measurement rigor and the value of that to service providers.
- Consider alternative program marketing tactics to reach additional market segments such as building tenants, including outreach through seemingly unrelated channels like residential bill inserts that promote ideas customers can act on in their workplace such as recommissioning.