



FIVE-YEAR PLAN FOR ENERGY EFFICIENCY

Executive Summary

Prepared for:
Holy Cross Energy



HOLY CROSS ENERGY

A Touchstone Energy® Cooperative 



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Executive Summary

In the next five years, Holy Cross Energy (HCE) and its members will pursue actions to accelerate the achievement of energy savings from investments in energy efficiency (EE). This current planning effort responds to priorities identified in the 2009 member survey, in which HCE members indicated continued support for energy efficiency and renewable energy programs and goals.¹ HCE continues to look for new ways to empower its members and staff to take meaningful, cost-effective steps toward securing a reliable and cost-effective base of resources to meet its energy needs. This effort builds on six years of education and incentives through HCE's *With Efficiency, Conservation and Renewable Energy (WE CARE) Program*.

This five-year plan seeks to address HCE's commitment to achieving deeper energy savings through a portfolio of Demand Side Management (DSM) programs. The programs outlined in this plan build upon HCE's existing WE CARE efforts, combining analysis of HCE consumer- and market-specific data with industry benchmarks and best practices. The plan provides HCE with a practical roadmap for setting and achieving energy efficiency goals as well as helping HCE's commitment to providing consumers cost-effective carbon emission reduction opportunities.

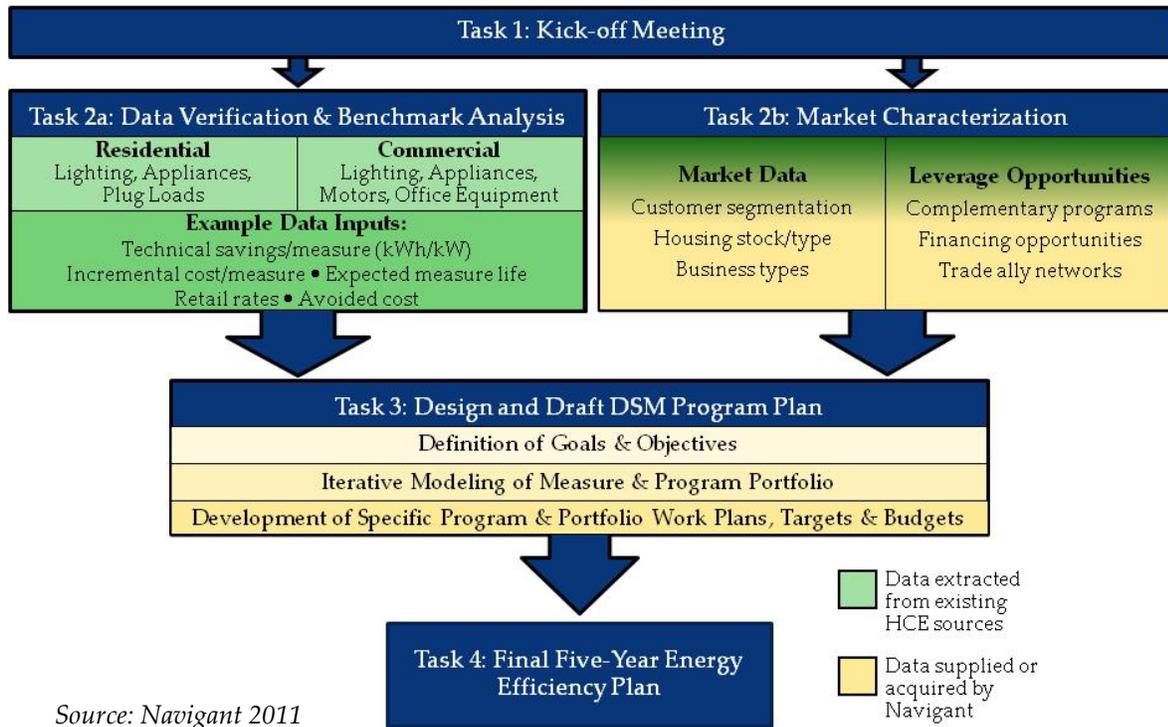
Portfolio Planning Process

Navigant Consulting, Inc. (Navigant) used a data-driven approach to DSM program planning, drawing upon primary and secondary data sources that combine industry best practices and benchmarks with HCE's specific energy savings opportunities and market characteristics. Drawing on its extensive DSM program evaluation and planning experience and with the help of its proprietary DSM Portfolio Planning Model, Navigant's team synthesized this data to generate realistic program goals and budgets. By basing projections on hard data and quantifiable assumptions as much as possible, the plan provides for more effective measurement and evaluation strategies that HCE can use to make mid-stream adjustments based on updated participation rates and changing market characteristics.

Figure ES-1 summarizes Navigant's planning approach. An initial kick-off meeting with HCE staff helped establish the availability of existing data sources, overarching goals and objectives, and the parameters within which the DSM programs must operate. The second major task included the incorporation of HCE's recent DSM potential study results and other economic assumptions into Navigant's program optimization model; it also included a review of industry benchmarks and best practices for cost-effective DSM program design and implementation. In addition, the team characterized HCE consumer energy usage, housing and business types, and opportunities to leverage complementary energy efficiency programs and trade ally networks (e.g., non-profits and local electric and heating, ventilating, and air conditioning [HVAC] contractors).

¹ GDS Associates, 2009, *2009 Member Survey: Attitudes on Carbon Emissions Reductions, Renewable Energy Resources and Smart Grid Technology*, Holy Cross Energy. Available: <http://www.holycross.com/member-services/2009survey>

Figure ES-1. Navigant DSM Program Portfolio Process



Based on its Task 2 findings, Navigant shared preliminary program recommendations and solicited feedback from HCE’s Energy Efficiency Task Force. Navigant incorporated this feedback in the subsequent iterative modeling process, wherein it defined energy savings goals and budgets for each DSM program using modeling software. The output of this analysis and the subsequent program design recommendations culminated in a Draft Five-Year Plan for Energy Efficiency (Draft Plan). Upon reviewing the Draft Plan, HCE’s staff and Board of Directors provided additional direction on the portfolio’s design. Specifically, HCE and its Board requested a reduction in the overall DSM portfolio budget and a reallocation of funds toward the plan’s commercial sector programs.

Table ES- 1 outlines the Board’s requested budget allocations for the Final Five-Year Plan for Energy Efficiency (Final Plan). Per the Board’s direction, 60 percent of annual WE CARE Program funding will be reserved for the EE Portfolio. Two-thirds of that EE Portfolio funding will be allocated to commercial consumers, with the remaining one-third allocated to residential consumers. In addition, the residential allocation includes a budget set-aside for two cost-sharing programs that fall outside of the EE Portfolio’s scope. HCE intends to lend support to the existing *Tri-County Energy Smart Program* and the *Low Income Weatherization Program* overseen by the Northwest Colorado Council of Governments.²

² The cost-sharing nature of these two programs made it too difficult to accurately model energy savings that would be attributable to HCE using the DSM Portfolio Planning Model.

Table ES- 1. Budget Allocations for EE Portfolio Programs

	2012	2013	2014	2015	2016	2012-2016
Baseline EE Portfolio Budget (60% of Annual WE CARE Budget)	\$1,406,618	\$1,478,287	\$1,560,060	\$1,637,061	\$1,714,775	\$7,796,801
Commercial EE Programs Budget for Five-Year Plan (67% of EE Portfolio Budget)	\$942,434	\$990,452	\$1,045,240	\$1,096,831	\$1,148,900	\$5,223,857
Residential EE Programs Budget (33% of EE Portfolio Budget)	\$464,184	\$487,835	\$514,820	\$540,230	\$565,876	\$2,572,944
Energy Smart and Low-Income Weatherization Program Contributions*	\$100,000	\$100,000				
Residential EE Programs Budget for Five-Year Plan	\$364,184	\$387,835	\$514,820	\$540,230	\$565,876	\$2,572,944

Note: Assumes \$50,000 each is contributed annually in 2012 and 2013 to the Energy Smart Program and Low-Income Weatherization Program.

Source: Navigant 2011

Five-Year Energy Efficiency Portfolio Goals and Metrics

The Board-specified budget allocations and limits necessitated a top-down approach to determining annual energy savings goals. Using HCE’s revised portfolio budget guidelines, Navigant developed energy saving goals based on DSM program results and best practices from 62 municipal and cooperative utilities across the country.³ Table ES-2 summarizes the plan’s resulting energy savings and investment targets. In setting these goals, the team accounted for HCE’s particular market challenges and opportunities, as well as the changing landscape of energy efficiency technologies and standards. The first-year energy savings target of 0.45 percent of forecasted sales represents an aggressive goal for HCE. Subsequent annual targets increase as staff, trade ally, and participant activities gain momentum and create efficiencies.

Table ES-2. HCE Savings Goals and Planned Investments (2012-2016)

	2012	2013	2014	2015	2016
Incremental Energy Savings Goal as % of Sales	0.45%	0.51%	0.55%	0.55%	0.55%
Planned Investment as % of Revenues	1.11%	1.12%	1.20%	1.20%	1.20%

Source: Navigant 2011

HCE’s planned goals and investment targets draw upon demonstrated industry best practices. Annual program budgets of *best practice organizations* are generally a factor of 2.0-2.5 times energy savings (as a

³ Agapay, L. and R. Gunn. Summit Blue Consulting, 2010, “Energy Efficiency Resource Standards for IOUs, Municipal, and Cooperative Utilities: Can One Size Fit All?” American Council for an Energy-Efficient Economy (ACEEE) 5th National Conference on Energy Efficiency as a Resource.

percentage of sales). For example, achieving 0.5 percent energy savings requires a budget between 1.0 percent and 1.25 percent of sales. These budgets must account for utility administration and program implementation activities, consumer incentives, marketing and outreach, and measurement and evaluation. In the earliest years of program implementation, however, utilities may require slightly higher relative budgets to account for start-up costs.

Meeting these aggressive goals will require a significant effort by HCE to effectively allocate staff resources, develop targeted marketing strategies, and leverage networks of local partners (such as the *Energy Smart Program*). Local municipalities, environmental organizations, trade contractors, and retailers all play important roles in the success of utility-led DSM programs. Most programs will require additional planning, staff additions, external resources, and other preparations before launching. HCE should also expect to adjust goals and budgets in later years based on measurement and evaluation activities, changing consumer demands, emerging trends, and the political and economic landscape.

Table ES-3 shows forecasted portfolio-wide energy savings and spending based on Navigant’s DSM Portfolio Planning Model outputs. Navigant proposes that HCE budget a total of \$7.8 million in energy efficiency programs over the next five years, targeting cumulative annual energy savings of 2.47 percent against 2016 sales forecasts. Table ES-3 illustrates that HCE can likely meet these energy savings goals at or below proposed annual spending benchmarks, with 95 percent of targeted cumulative annual energy savings achieved using only 84 percent of forecasted budgets (about \$6.55 million). **This equates to 2.35 percent savings against forecasted 2016 energy usage.**

Table ES-3. Investment and Savings Targets (2012-2016)

Investment	2012	2013	2014	2015	2016	Total
Spending Target as % of Revenue	1.11%	1.12%	1.20%	1.20%	1.20%	1.20%
Spending Target (\$)*	\$1,306,618	\$1,378,287	\$1,560,060	\$1,637,061	\$1,714,775	\$7,596,801
Planned Investment (\$)	\$1,002,468	\$1,209,744	\$1,403,501	\$1,437,910	\$1,495,503	\$6,549,126
% of Spending Target	77%	88%	90%	88%	87%	84%
Contingency Budget (\$)	\$304,150	\$168,543	\$156,559	\$199,151	\$219,272	\$1,047,675
Savings	2012	2013	2014	2015	2016	Cumulative
Incremental Savings Goal as % of Forecasted Sales	0.45%	0.51%	0.55%	0.55%	0.55%	2.47%
Incremental Savings Goal (MWh)	5,392	6,299	6,941	7,106	7,301	33,039
Planned Incremental Savings (MWh)	4,550	5,928	6,715	6,997	7,316	31,506
Planned Incremental Savings as % of Forecasted Sales	0.38%	0.85%	1.35%	1.86%	2.35%	2.35%
% of Savings Goal	84%	94%	97%	98%	100%	95%

Note: Spending target excludes \$100,000 budget set aside in 2012 and 2013 for the *Energy Smart* and *Low Income Weatherization Programs*. “Cumulative” values in the last column refer to annual energy savings planned by 2016. “Incremental” savings values represent new savings achieved each year.

Source: Navigant 2011

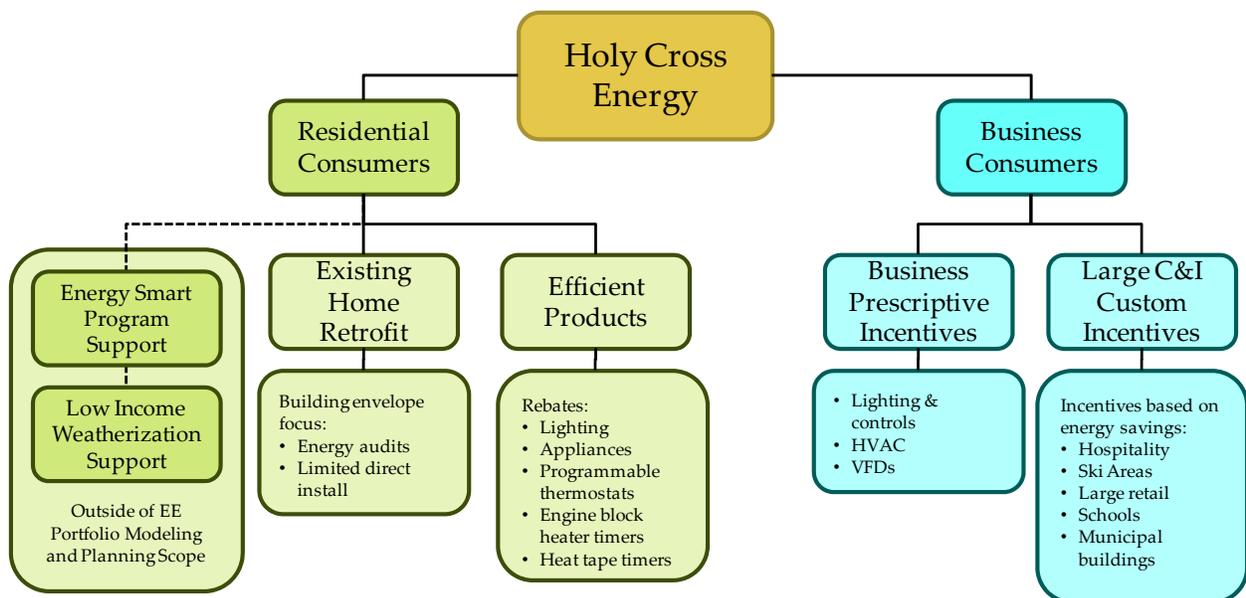
Table ES-3 also reveals the relatively conservative approach used to forecast program participation in the first year, with only 84% of the targeted savings achieved in the DSM Portfolio Planning Model. This shortfall primarily results from HCE using a low (but reasonable) assumption for the per-project energy savings provided by its *Large C&I Custom Grants Program*. This resulted in an annual contingency budget that will allow HCE flexibility to shift resources as programs ramp up and participation trends evolve. With targeted marketing of that program to large commercial and industrial (C&I) consumers with the highest electricity usage, Navigant anticipates that per-project savings will be substantially higher than the modeled assumption. This would consume contingency funds through increased incentives and program administration costs, and would subsequently close the savings gap.

This plan presents a five-year portfolio investment based on current revenue forecasts through 2016. HCE will need to adjust projected investment levels each year based on updated revenue forecasts and the availability of program funds. Additionally, HCE should review and adjust incentive levels and other program elements to reflect changes in market conditions or implementation processes in order to maximize cost-effective savings.

Recommended DSM Portfolio Summary

This section provides a brief overview of HCE’s recommended DSM programs, including energy savings targets, budgets, and forecasted cost-benefit results. Figure ES-2 provides a graphic representation of HCE’s recommended DSM program portfolio. In addition to “tried and true,” proven-cost-effective measures, several of the programs include emerging technologies and energy-saving strategies that place HCE at the forefront of DSM program design. Navigant recommends HCE offer two residential programs and two business programs to achieve its energy savings goals most cost-effectively.

Figure ES-2. DSM Program Portfolio Structure



Source: Navigant 2011

It is important to note that Navigant defines “programs” by each specific market and technology end-use type primarily for planning purposes and to present projected savings, costs, and cost-effectiveness. During implementation, HCE should consider the best ways to present the programs to its consumers in

a more accessible manner. For example, the two residential programs might be marketed as the “Home Energy Assessment and Upgrade” and “Energy Efficient Product Rebates” programs, respectively.

Summary of Residential Programs

Navigant’s recommended residential DSM programs build upon HCE’s existing *WE CARE* program offerings and leverage other energy efficiency programs and incentives at the regional and state level. HCE should offer these programs as a unified residential program that seeks to help residents identify energy savings opportunities in their homes and to subsequently *take action* to reduce their energy use.

Existing Home Retrofit

This expansion and refocusing of HCE’s home energy audit program will aggressively target cost-effective residential energy-saving measures, with a focus on converting home energy assessments to homeowner action through education and incentives. Currently, HCE conducts the majority of its energy audits in response to consumer complaints about high bills. HCE should reposition and market the program as an energy savings opportunity to those consumers with the highest savings potential and the means to invest in improvements. Specifically, during this initial planning period, HCE should target the program to all-electric consumers who own and occupy their own homes. All-electric consumers use 50 percent more electricity per meter than non-all-electric consumers, and targeting owner-occupied housing eliminates the challenge of split incentives between tenants and owners.

HCE should also expand its direct installation of complimentary compact fluorescent lights (CFLs) to include complimentary low-cost water-saving measures for consumers with electric water heaters as well as discounted programmable thermostats for those with electric or forced-air heating or cooling. The program should work in close concert with the emerging Energy Smart Program, taking advantage of that program’s in-home energy assessments and data-sharing opportunities wherever possible. The program will offer a small set of cost-effective home weatherization incentives, and will additionally encourage consumers to take advantage of rebates available in the residential *Efficient Products Program*.

Efficient Products

This expansion of HCE’s appliance rebate program seeks to achieve long-term energy savings through replacement of inefficient equipment and appliances, with an increased focus on residential lighting equipment. Targeted trade ally outreach, periodic retail buy-down of CFLs, and appliance recycling promotions will seek to increase the availability and marketing of efficient products in HCE’s territory. Incentives will target HCE consumers’ most significant energy savings opportunities in lighting and appliance end uses. Other specific measures include programmable thermostats, engine block heater timers, and heat tape system timers; heat tape timers are a relatively new DSM program measure that HCE can help to pilot and model for utilities in similar climates. The program’s incentives will also enhance HCE’s ability to persuade participants in the *Existing Homes Retrofit Program* to take action on recommendations received during home energy assessments.

Summary of Business Programs

Navigant’s recommended non-residential DSM programs represent a significant expansion over HCE’s existing C&I custom grants program. A set of straightforward prescriptive equipment rebates will help lower barriers to program participation for HCE’s small business consumers. In addition, an increase in funding limits for the custom grant program will help attract large-scale, cost-effective efficiency investments from HCE’s larger C&I accounts.

Business Prescriptive Incentives

This program offers a straightforward approach for commercial consumers who wish to take advantage of common energy savings opportunities. The program will create long-term energy savings by offering cash rebates for the replacement of inefficient lighting, HVAC, and other equipment with high-efficiency technologies that they would not have otherwise installed without the program. Incentives will initially target lighting, limited HVAC, and other end uses that have the highest energy savings potential within HCE's business sector, and will leverage trade ally education and training to help educate consumers about the potential life-cycle savings.

Large C&I Custom Incentives

This program expands and refocuses HCE's custom grants program for its largest commercial and industrial consumers.⁴ Most importantly, HCE's previous grant limits (based on each consumer's annual usage) will be changed to an across-the-board \$100,000 annual grant limit to any single account holder. HCE should continue to offer grants for technical services, though Navigant recommends these be contingent on the consumer implementing additional measures. In addition, incentives will be available for the installation of energy-saving measures based on forecasted reductions in energy usage (e.g., \$/kilowatt-hour [kWh]). The grants will target some of the more specialized equipment and processes often in use at large, energy-intensive consumer sites (e.g., food service, HVAC, and variable-frequency drives [VFDs]). Incentives received under the *Business Prescriptive Incentives Program* will also count toward each consumer's annual total grant limit.

Program Goals and Metrics

Tables ES-4, ES-5, and ES-6 present each program's total energy savings and corresponding investment levels over the plan's five years, followed by the same metrics for each individual year. The first table also includes the overall and program-specific Total Resource Cost (TRC) test results and Lifetime Cost of Conserved Energy per kWh statistics.

Table ES-4. Portfolio Total Savings and Investment (2012-2016)

Program	Total Resource Cost (TRC) Test	Lifetime Cost of Conserved Energy (\$/kWh)	Cumulative Total (2012-2016)		
			Annual Energy Savings (MWh)	Annual Coincident Demand Savings (MW)	Investment
Existing Home Retrofit	1.5	\$0.02	6,745	0.96	\$1,742,060
Efficient Products	2.3	\$0.02	4,035	0.55	\$613,546
Residential Subtotal	1.7	\$0.02	10,780	1.51	\$2,355,606
Prescriptive Incentives	2.1	\$0.02	13,215	2.13	\$2,343,085
Large C&I Custom	1.3	\$0.03	7,511	0.96	\$1,850,435
Business Subtotal	1.8	\$0.02	20,726	3.09	\$4,193,520
TOTAL	1.8	\$0.02	31,506	4.60	\$6,549,126
<i>Contingency Budget</i>					\$1,047,675

Source: Navigant 2011

⁴ Large C&I consumers are defined as those on rate schedules 63, 63s, 64, 66, 66s, 67, 67s, 68, and 69.

Table ES-5. Annual Savings and Total Investment (2012-2014)

Program	2012			2013			2014		
	Incremental Energy Savings (MWh)	Increm. Peak Demand Savings (MW)	Investment	Incremental Energy Savings (MWh)	Increm. Peak Demand Savings (MW)	Investment	Incremental Energy Savings (MWh)	Increm. Peak Demand Savings (MW)	Investment
Existing Home Retrofit	1,193	0.17	\$272,112	1,457	0.21	\$299,172	1,397	0.20	\$381,934
Efficient Products	543	0.08	\$91,998	586	0.08	\$87,028	820	0.11	\$130,873
Residential Subtotal	1,735	0.25	\$364,110	2,043	0.29	\$386,200	2,217	0.31	\$512,808
Prescriptive Incentives	1,929	0.31	\$388,101	2,558	0.42	\$469,460	2,732	0.44	\$481,010
Large C&I Custom	885	0.11	\$250,257	1,328	0.17	\$354,084	1,766	0.22	\$409,683
Business Subtotal	2,814	0.43	\$638,358	3,885	0.59	\$823,544	4,498	0.67	\$890,693
TOTAL	4,550	0.68	\$1,002,468	5,928	0.87	\$1,209,744	6,715	0.97	\$1,403,501
Contingency Budget			\$304,150			\$168,543			\$156,559

Note: Totals may include differences due to rounding.

Source: Navigant 2011

Table ES-6. Annual Savings and Total Investment (2015-2016)

Program	2015			2016		
	Incremental Energy Savings (MWh)	Incremental Peak Demand Savings (MW)	Investment	Incremental Energy Savings (MWh)	Incremental Peak Demand Savings (MW)	Investment
Existing Home Retrofit	1,350	0.19	\$382,960	1,350	0.19	\$405,881
Efficient Products	1,017	0.14	\$148,909	1,068	0.14	\$154,737
Residential Subtotal	2,367	0.33	\$531,870	2,418	0.33	\$560,619
Prescriptive Incentives	2,864	0.46	\$490,731	3,132	0.50	\$513,782
Large C&I Custom	1,766	0.22	\$415,309	1,766	0.22	\$421,103
Business Subtotal	4,630	0.68	\$906,040	4,898	0.73	\$934,884
TOTAL	6,997	1.01	\$1,437,910	7,316	1.06	\$1,495,503
Contingency Budget			\$199,151			\$219,272

Note: Totals may include differences due to rounding.

Source: Navigant 2011

Portfolio Implementation

Navigant recommends that HCE implement the proposed portfolio through a combination of in-house utility staff and third-party implementation contractors. HCE should issue up to three separate Requests for Proposals (RFPs) to qualified firms, each covering one of the work areas described in Table ES-7. Based on its knowledge of potentially qualified contractors, HCE may also consider bundling some of these work areas into a single RFP (e.g., combining #2 and #3). This approach would enable HCE to obtain more competitive, cost-effective, and qualified responses. It will also encourage proposing firms to form partnerships that can provide HCE an integrated team approach that will simplify collaboration and reduce HCE’s administrative costs.

Table ES-7. Recommended Implementation Contractor RFP Components

RFP Component	Work Areas	Scope of Work
#1	Data Management System	Design and implement a DSM program tracking and data management system.
#2	Trade Ally Outreach	Conduct contractor orientations and pre-qualification; coordinate with distributors and retailers to ensure availability of incentivized equipment; arrange promotions and cooperative advertising.
#3	Marketing Communications	Design and prepare DSM program marketing materials.

Source: Navigant 2011

Navigant considers these three components as necessary steps to take in advance of the rollout of any changes in HCE’s current DSM program offerings. Navigant anticipates that—even with an aggressive approach—it will take three to four months for HCE to prepare the RFPs, evaluate and select contractors, and for all requisite work to be completed prior to programs launching. In order to position the new program offerings as a comprehensive approach and to maximize awareness generated, HCE should aim to launch each sector’s programs simultaneously.

In addition, Navigant recommends that HCE hire an additional full-time employee whose time can be partially allocated to the significant expansion of the commercial DSM programs. Targeted participation levels in the *Business Prescriptive Incentives* and *Large C&I Custom Programs* will rely on HCE having a dedicated account representative to market programs to members on an ongoing basis. This individual’s responsibilities will benefit other parts of utility operations as the individual builds strong relationships with HCE’s largest consumers.

Measurement and Evaluation

Timing of evaluation, measurement, and verification (EM&V) activities and reporting can have a significant effect on the accuracy and usefulness of findings. Data collection done months or years after a program intervention can be weakened by fading memories, lost data, and confounding events that have happened in the intervening time. EM&V reports that come well after program intervention can arrive too late to provide input at key program implementation stages.

EM&V plans are designed to mitigate these problems. EM&V plans integrate select data collection within the program implementation process and provide near real-time feedback on key indicators of program progress. EM&V processes that take an “integrated data collection” approach to planning seek out

opportunities in the program implementation process where evaluation data can be collected efficiently, cost-effectively, accurately, and produce timely results.

Such integrated approaches inform several types of EM&V studies. Navigant recommends that HCE focus its evaluation resources on impact evaluation. This approach will enable HCE to validate program assumptions about measure savings and cost-effectiveness. It also enables HCE and its implementation partners to assess the need to adjust rebates. These inputs can help HCE adjust its savings targets or cost-effectiveness screens. In addition, the impact evaluations validate the work of implementation contractors whose compensation may be partially based on the achievement of energy savings. These efforts to ensure appropriate use of member funds should be prioritized.

Process and market studies also provide useful information for program implementers and may be considered if the portfolio fails to meet its energy savings targets. The information about the priorities and decision-making processes for the target market that market studies provide can help re-direct marketing efforts or incentive levels. Process evaluations can identify any processes or strategies that the program uses that may create high barriers to participation. Both of these types of information can inform adjustments to implementation plans as needed.

HCE should work with an evaluation contractor to develop appropriate M&V plans.

The key components of the process and impact evaluations include the following:

- » Evaluations conducted by an independent, DSM evaluation consultant obtained through an RFP process
- » Verification, by an appropriate sample, that efficiency measures are installed as expected
- » In-field measure performance measurement and data collection
- » Energy and demand savings analysis to compute the results that are being achieved
- » Cost-effectiveness analysis by program and overall DSM portfolio
- » Identification of important opportunities for improvement

Given the budget levels available for evaluation, HCE should carefully consider the prioritization of measures and the balance between on-site data collection and engineering analysis.

Program and Portfolio Risk

Any DSM modeling effort and resulting energy efficiency plan are subject to overarching risks associated with changing political, economic, and implementation phase circumstances. These factors can affect realized energy savings or cost-effectiveness. To minimize the potential effects of these risks on HCE's DSM portfolio, Navigant has employed the following strategies in designing HCE's programs.

- » Recommending a broad portfolio of programs across HCE's consumer base
- » Drawing upon "tried and true" programs that other utilities across the country have previously proven successful
- » Where appropriate, recommending that HCE hire program implementation contractors with significant experience in implementing similar energy efficiency programs in Colorado and other regions

- » Including a robust set of program evaluation recommendations, including the implementation of a program tracking and data management system, to enable real-time and ongoing feedback on program progress and to allow any needed fine-tuning to occur as soon as possible.

The continued application of these key strategies in planning and implementation initiatives will help to ensure continued success.