

Integrated Resource Plan

Prepared for
Nebraska City Utilities
Nebraska City, Nebraska

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Section I. Introduction

This is the Integrated Resource Plan (IRP) for Nebraska City Utilities (NCU). The IRP was developed to identify NCU's resource requirements for the 10-year period beginning fiscal year 2007 through fiscal year 2016.

Purpose

NCU is responsible for serving Nebraska City with electricity, gas, water, and sanitary sewer services. NCU's electric service territory includes the City, as well as several villages in Otoe County, Lancaster County, and Nemaha County, Nebraska. The villages located in Otoe County include: Dunbar, Lorton, Otoe, Unadilla, Palmyra, and Douglas. The village of Bennet is located in Lancaster County and the villages of Julian and Brock are located in Nemaha County. In addition, NCU serves at wholesale the villages of Panama and Talmage, located in Lancaster County and Otoe County, respectively. NCU also serves many farm customers along its rural distribution lines between the villages that it serves as well as various spur lines within the counties.

Western Area Power Administration (WAPA) instituted a program called the Energy Planning and Management Program (EPAMP). EPAMP became effective on November 20, 1995. EPAMP includes a provision that requires its customers to prepare and submit an IRP to WAPA to maintain their current allocations of power and energy from WAPA. This IRP is also intended to meet WAPA's requirements.

As part of NCU's ongoing obligation under EPAMP, it periodically prepares and updates its IRP. The purpose of this IRP is to develop two and five-year implementation plans to serve NCU's power supply requirements at the lowest reasonable cost consistent with prudent financial and technical principles.

Discussion of Past IRP Studies

NCU submitted an IRP to Western in 2002. The 2002 IRP recommended that NCU monitor baseload projects for feasibility and extend the Omaha Public Power District (OPPD) contract until a new baseload purchase/participation could be made. NCU implemented the IRP recommendations for a new baseload purchase/participation by participating in the OPPD Nebraska City Unit #2 (NC-2) Project and the Whelan Energy Center Unit 2 (WEC2) Project. The 2002 IRP also recommended that NCU continue to work with the National Arbor Day Foundation and the Nebraska Energy Office (NEO) in addition to the use of the NCU website to promote energy efficiency and Demand Side Management (DSM) programs. NCU continues to use its website and work with the National Arbor Day Foundation and the NEO to promote energy efficiency and DSM programs. Through the use of its website, NCU also provides links to the Department of Energy's Energy Efficiency and Renewable Energy, American Public Power Association's Tree Benefits, and provides customers with an extensive list of energy saving tips. NCU submits progress reports on the IRP annually to Western.

Methodology

This IRP was prepared consistent with EPAMP's suggested methodology and is consistent with prior NCU IRPs. The methodology used to prepare this IRP is summarized by the following list of tasks:

- Prepared NCU peak demand and energy requirements forecast.
- Compared forecasted peak demand and energy requirements to existing NCU power supply resources to estimate future resource needs.
- Screened power supply resource options to identify economical resources to include in the integration analysis.

- Screened DSM measures to identify economical and technically feasible measures that could be included in the integration analysis.
- Integrated DSM measures with supply resources to develop IRP options.
- Considered environmental impacts and costs of each IRP option.
- Developed recommendation based on economic and non-economic considerations.
- Solicited public participation and incorporated comments in the IRP.

General Objectives

NCU's goal is to provide the best possible service at the lowest possible cost commensurate with that service. To achieve this stated goal, NCU focused on the following objectives in developing the IRP:

- Maintain local control of the utilities system.
- Focus on being customer-oriented.
- Maintain lowest possible cost.
- Maintain financial and rate stability.

Background/Utility Profile & History

NCU is a not-for-profit municipally owned electric utility located in southeastern Nebraska. Nebraska City purchased the natural gas and water systems in 1941, and the electrical system in 1944. The resulting Board of Public Works was created by the City Commission to operate the combined electric, gas and water utility system. In 1963, the operation of the sanitary sewer system was also turned over to the Board of Public Works.

Nebraska City Utilities Statistics:

In 2006, the electric customers were segmented in the following customer classes:

NCU had a system peak of 37,459 kW in 2006. Nebraska City's annual energy usage was 169,498 MWh in 2006, for an annual load factor of 51.65%.

Section II. Load Forecast

Introduction

Based on trending analysis and identification of known new loads, an annual growth rate of 1.5% - 2.0% appears reasonable. Since 1998, annual energy growth has averaged 1.6% per year. The forecast is presented in Table 1. Load projections were based on historical data through the year 2006, with system load growth projected at 1.5% - 2.0% per year thereafter. Energy calculations are based on projected demand, hours in the year, and a load factor of 52%.

Table 1
Nebraska City Utilities
Historical and Projected
Peak Demand and Energy Requirements

Year	Net System Peak kW	Percent Change	Net System Energy MWh	Percent Change	Load Factor %
1997	30,970		143,811		53%
1998	33,100	6.88%	146,857	2.12%	51%
1999	32,510	-1.78%	150,242	2.30%	53%
2000	36,170	11.26%	156,509	4.17%	49%
2001	35,175	-2.75%	157,355	0.54%	51%
2002	35,115	-0.17%	166,673	5.92%	54%
2003	36,112	2.84%	166,015	-0.39%	52%
2004	36,156	0.12%	164,708	-0.79%	52%
2005	36,284	0.35%	172,250	4.58%	54%
2006	37,459	3.24%	169,498	-1.60%	52%
2007	38,237	2.08%	174,176	2.76%	52%
2008	38,938	1.83%	177,855	2.11%	52%
2009	39,639	1.80%	180,563	1.52%	52%
2010	40,340	1.77%	183,756	1.77%	52%
2011	41,041	1.74%	186,949	1.74%	52%
2012	41,742	1.71%	190,663	1.99%	52%
2013	42,443	1.68%	193,336	1.40%	52%
2014	43,144	1.65%	196,529	1.65%	52%
2015	43,845	1.62%	199,722	1.62%	52%
2016	44,546	1.60%	203,471	1.88%	52%

Section III. Supply Side Resource Analysis

Current Power Supply Arrangements

The NCU system includes owned and purchased power supply resources, DSM programs and transmission system arrangements.

Existing Supply Side Resources

NCU's system generates 37 MW capacity and energy, purchases 8 MW of capacity and energy from WAPA, and has ownership rights for 21 MW of baseload that is currently under construction. Table 2 summarizes Nebraska City's existing supply side resources.

Table 2
Nebraska City Utilities
Existing Generating Resources - 2006

Source	Capacity (MW)	Energy (MWh)
Generation	37.15	5,718
WAPA	8.24	38,206
Municipal Energy Agency of Nebraska (MEAN)	0.00	125,575
Omaha Public Power District (OPPD) (1)	0.00	0
Total	45.39	169,499

(1) MEAN provides scheduling services for the MAPP Service Schedule C, non-firm energy from OPPD to Nebraska City.

Owned Generation. NCU owns and operates three diesel engine generator plants and its own natural gas utility. The generation is fueled by natural gas and/or oil.

WAPA. WAPA delivers firm electric service to Nebraska City. This agreement terminates in 2024.

Municipal Energy Agency of Nebraska (MEAN). MEAN provides scheduling services for the MAPP Service Schedule C, non-firm energy from OPPD to Nebraska City. This contract expires April 30, 2010.

Omaha Public Power District (OPPD). NCU has a contract with OPPD that provides energy, and only requires NCU to generate a maximum of 750 hours per year. The existing contract expires April 30, 2010.

OPPD Nebraska City Unit #2 (NC-2). NCU has a contract with OPPD for 1.67% of 663 MW (or 11.07 MW) of NC-2 which is projected to come online in May 2009. This contract has an initial term of 40 years with optional renewals that could extend to the life of the unit.

Public Power Generation Agency (PPGA). NCU has entered into a Participation Agreement with PPGA for 4.55% of 220 MW (or 10 MW) of WEC2 which is projected to come online in February 2011. The existing contract expires at the later of the maturity of the bonds or the decommissioning of WEC2.

Transmission. Nebraska City is interconnected at 69 kV with OPPD at both Nebraska City and Syracuse. OPPD provides transmission service for WAPA and OPPD purchases under firm and non-firm point-to-point transmission arrangements. MEAN serves as the scheduling agent for the OPPD transmission service.

Comparison of Loads and Resources

Forecasted peak demand and energy requirements were summarized and compared to existing capacity and energy resources. Table 3 (page 8) summarizes the Comparison of Peak Demand and Energy Requirements to Resources. Figure 1 (page 9) is the graphical presentation of the comparison of loads and resources.

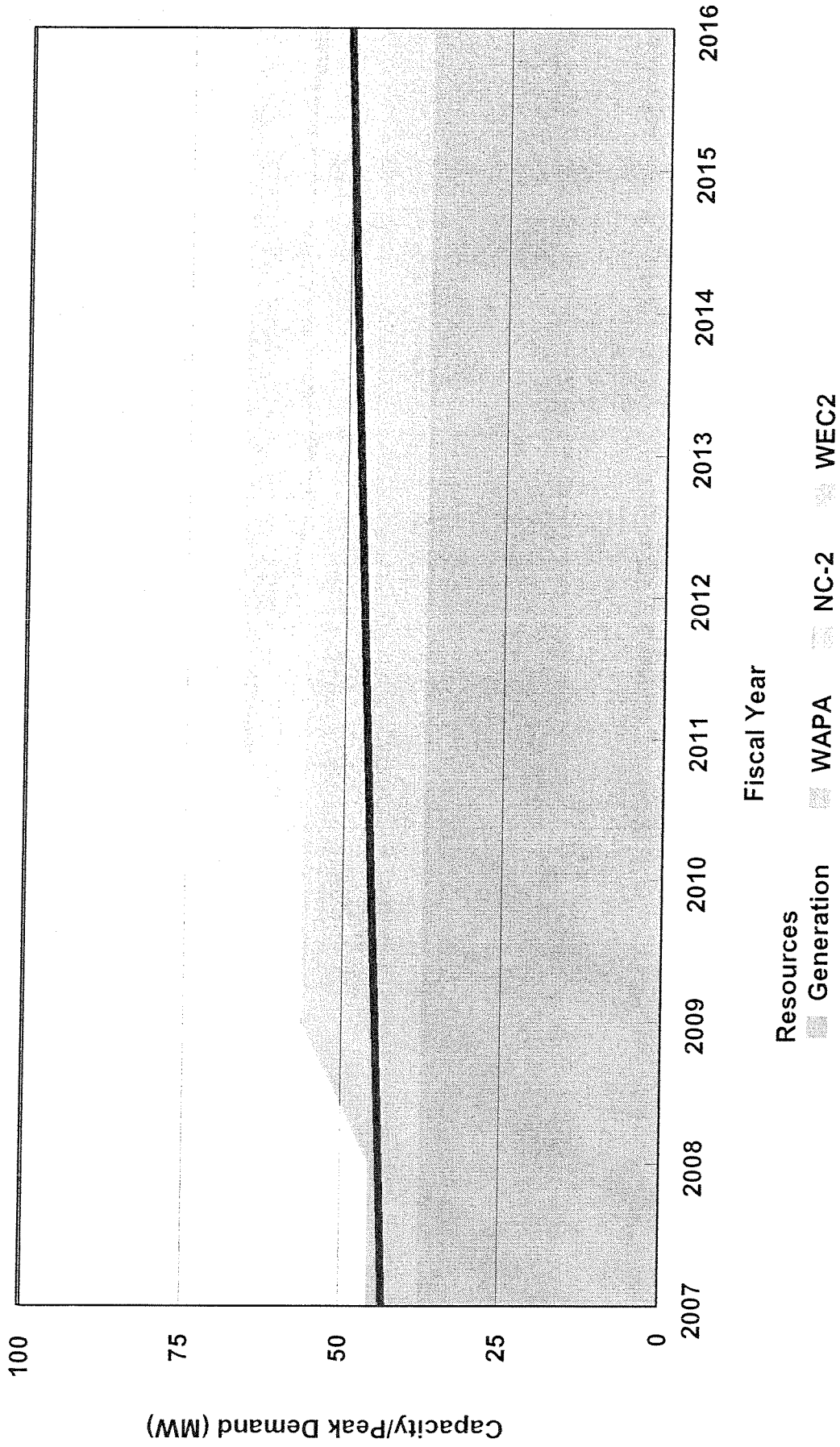
Table 3
Comparison of Peak Demand and
Energy Requirements to Resources

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<u>Demand</u>										
Peak Demand Obligation (1) (2)	42.7	43.5	44.3	45.2	46.0	46.8	47.6	48.4	49.2	50.0
Capacity Resources (3)	45.4	45.4	56.4	56.4	66.3	66.3	66.3	66.3	66.3	66.3
Surplus/(Deficit)	2.7	1.9	12.1	11.2	20.3	19.5	18.7	17.9	17.1	16.3

Notes:

- (1) Included forecast demand and 15% required reserves.
- (2) Peak Demand is the summer peak, as Nebraska City Utilities is a summer peaker.
- (3) Included 1% reduction in WAPA in 2011.

Figure 1
Nebraska City, Nebraska
Comparison of Load vs. Resources



NCU Peak Demand Obligation includes peak demand and capacity reserves. Capacity reserves were calculated using the Mid-Continent Area Power Pool (MAPP) Generation Reserve Sharing Pool (GRSP) reserve requirement of 15% of peak demand.

Based on the Comparison of Peak Demand and Energy Requirements to Resources, the following was concluded:

- NCU has sufficient capacity throughout the study period.
- NCU may need outage replacement energy during scheduled outages of NC-2 and WEC2 after expiration of the OPPD contract.
- NCU has sufficient energy available from peaking capacity to supply energy needs during high load hours; however, it may be advantageous to purchase non-firm energy if it is less expensive than the operating costs of peaking generation.

The owned resources typically are not used to generate energy because the cost of energy from these resources is greater than the cost of energy in the economy market.

Future Supply Side Resources

NCU participates in a statewide joint planning effort through the Nebraska Power Association (NPA). Utilities in NPA jointly coordinate long-term power supply plans to meet the electric power needs of the state of Nebraska. NCU participates in NPA's resource planning process.

Identification of Resource Options

The following is a description of the supply options that were reviewed.

Renewable Resources. NCU has explored the possibility of wind energy through the Lewis and Clark Interpretive Center that was to be constructed in Nebraska City. A wind resource study was performed through the support of the National Renewable Energy Lab

(NREL) to determine the feasibility of wind energy in the area. The National Arbor Day Foundation has also talked of wind demo site in Nebraska City. Due to the geographic location of Nebraska City, it is not an ideal location for wind energy development. If developed in Nebraska City, wind resources would likely have significantly higher capital costs than wind resources developed in locations having higher wind potential.

NCU, through its membership in MEAN, is involved in the wind project in Kimball, Nebraska. The Board of Public Works of Nebraska City authorized NCU staff to evaluate the possibility of an energy purchase from this site. OPPD also includes renewable resources in its portfolio, including wind energy and landfill methane.

NCU has held discussions with a local engineer with the National Arbor Day Foundation concerning the possibility of a joint venture promoting Biomass Electric Generation. Biomass is plant matter, agricultural wastes, animal manures, and wood and forest residues that can be converted into electricity. The cost of electricity generated from biomass depends on several variables including the cost of the biomass fuel and the size of the power plant. Grants may be requested to accomplish this project if enough interest is generated to proceed. The project was not feasible and is not being pursued.

Based on the lack of feasible alternatives and insufficient customer interest, renewable resources are not being pursued.

Unit Participation and Energy Purchases. Unit participation purchases in generating facilities of other utilities is an option for long-term resources. NCU is involved in the following:

- OPPD Nebraska City 2.
- PPGA Whelan Energy Center 2.

Evaluation Criteria

Evaluation criteria were established for the power supply resources. The criteria included:

- Ability to meet NCU's resource needs.
- Reliability and availability of the resources.
- Operational flexibility of the resource.
- Environmental impacts and compliance costs.
- Total delivered cost of the resource.

Supply Side Resources Selected for Screening

Several power supply resources were screened and evaluated for inclusion in the NCU IRP. Due to the fact that NCU has sufficient capacity resources throughout the study period, supply-side resource alternatives focused on NCU's energy needs.

The supply-side resource alternatives are listed as follows:

- Continued non-firm purchase with OPPD or other supplier.
- Additional baseload capacity and energy to offset peaking energy.

Section IV. Demand Side Analysis

Review of Load Shape Objectives

The Electric Power Research Industry (EPRI) developed six industry accepted load shape objectives. These objectives are as follows:

Strategic Load Growth

Strategic Load Growth involves promoting increased loads in all hours for utilities with surplus capacity for all periods of the year.

Peak Clipping

Peak Clipping is the reduction of system peak loads in order to reduce the reliance on peaking units with high fuel costs. Air conditioning load cycling is an example of a peak clipping program.

Strategic Conservation

Strategic conservation is directed at reducing end-use consumption through the conservation of energy and environmental resources. Strategic conservation has a levelized effect on end-use consumption, and thus has a minimal effect on peak load. An example of strategic conservation is an appliance efficiency program.

Valley Filling

Valley filling is a load management program that involves increasing off-peak loads. Street lighting is an example of a program that may build evening loads which are normally off-peak.

Load Shifting

Load shifting involves shifting load from peak to off-peak periods. Irrigation load control and thermal energy storage systems are examples of load shifting.

Flexible Load Shape

Flexible load shape programs modify the load shape on short notice to meet demand requirements without modifying load during periods when it is not needed. Interruptible rates are an example of flexible load shape.

DSM Program Evaluations

Demand Side Management (DSM) measures were considered as a means of deferring capacity acquisitions. DSM measures modify the customer or end use load shape. Fifteen types of DSM programs were evaluated using screening analysis and economic feasibility.

Residential Central Air Conditioning Load Cycling

This DSM program requires the installation of a load-control device that will cycle off the air conditioner during summer peak-load periods. The customer incentive is estimated to be \$20 per year with an average load reduction of .85 kW.

Residential Electric Water Heater Load Shedding

A customer incentive of \$20 per year would be given to customers already participating in the air conditioner load cycling program and who also have their electric water heater cycled off for periods of time during summer peak-load hours.

Residential High Efficiency Central Air Conditioners

For customers needing to replace their existing air conditioner, this program provides rebates or incentives when NCU selects the size of the customer's new or replacement air conditioner. The requirements include that the unit's size will not be more than 125% of design heat gain according to Manual J standards, and a minimum SEER of 12. Local contractors market high efficiency equipment, although no rebates or incentives are provided.

Residential Room and Window Air Conditioner Rebates

This program is for customers needing to replace their existing room or window air conditioner. Rebates of \$50-55 are available to customers selecting a unit with a SEER of 10 or more.

High Efficiency Refrigerator Rebate Program

Customers purchasing a refrigerator 15% or more efficient than the minimum 1993 standard would be eligible for a \$50 rebate. The customer would be required to give the old refrigerator to the dealer who would dispose of it.

Old Refrigerator Pick-up Program

This purpose of this program is to remove refrigerators that are used as second units from homes and the refrigerator market. The program educates customers about the costs of the second refrigerator, and provides a \$25 incentive to customers for turning in old frost-free refrigerators that are still operable. Coordination must occur with local dealers who will dispose of the old refrigerators.

Improved Home Loan Program for Furnace & AC Replacement

This program provides a loan subsidy to customers installing properly sized high-efficiency equipment. This is achieved by Nebraska City providing loan funds or by making a payment directly to the bank granting the loan. NCU promotes the Nebraska Energy Office loans via the NCU website.

Energy-Efficient New Home

Customers receive an incentive in the form of a rebate, rate discount or a loan subsidy from Nebraska City for building a new home to meet certain energy efficiency standards. This program requires a central air conditioner and furnace that are high efficiency and not oversized.

This program also requires additional insulation, reduction of infiltration, and reduction of heat gain or loss.

Energy-Efficient Existing Home

Energy efficient improvements including additional insulation, reduction of infiltration, and full basement insulation would be eligible for a customer incentive. Additional requirements are that the central air conditioner and furnace be high efficiency and not oversized. NCU includes information about energy efficiency improvements through its web site and also promotes through bill stuffers.

Commercial High-Efficiency Lighting

This program would provide incentives, rebates or loans for commercial and industrial customers who increase the efficiency of their lighting. It was assumed that equipment being replaced was replaced with similar or higher efficiency equipment, and only permanent improvements or replacements qualify. Examples include T8 lights with electronic ballasts and adding day-lighting controls.

Commercial High-Efficiency Air Conditioners

Small commercial customers would receive incentives for installing high-efficiency air conditioners when replacing their existing units. Examples of qualifying equipment are room air conditioners, packaged terminal units, rooftop units, and split systems.

Commercial HVAC Efficiency Improvement Program

Commercial and Industrial customers with large cooling systems would be eligible for incentives, rebates or loans when they reduce their electrical energy consumption of their HVAC systems. Adding cooling towers, and energy management controls are examples of eligible improvements.

Large Customer Customized Rebate Program

This program provides incentives to commercial and industrial customers who save energy in ways that are not covered by other DSM programs. Examples of eligible energy-efficiency improvements include energy-efficient motors and energy management systems as long as the energy savings would be lasting.

Interruptible Rates

Large Industrial customers would receive a credit for interrupting all or part of their load during summer peak periods when asked to do so by NCU. The customer signs a contract before the summer starts, and is obligated to interrupt a certain amount of their load up to 10 times during a year for periods of eight hours or less.

Residential Tree Planting Program

This program is based on a recent analysis on the effect of urban trees on the air conditioning requirements of residential homes. The analysis notes that trees planted on the west side of homes that provide shade during the peak-load hours reduce air conditioning needs. Although air conditioning savings are postponed by an average of 10 years because the trees have to grow, the long-term air conditioning savings are estimated to equal half of the cost of the program. The existing home market is nearly saturated, but NCU continues to offer customers a partial reimbursement on the cost of an energy saving tree.

Based on NCU's resources and load profile, the types of DSM most suitable are:

- Strategic conservation (summer season) to reduce end-use consumption during peak periods.
- Strategic load building (winter season) to build loads during periods of surplus capacity.
- Peak clipping (summer season) to reduce peaking energy needs.

Screening Analysis

The screening analysis consisted of two steps. The first step, Qualitative Screening, ranked the potential DSM measures according to subjective criteria, such as customer preference, market potential, and ease of implementation. A score was assigned to each DSM measure and the measures were ranked. This narrowed the list of measures to be economically further evaluated.

The DSM measures were then evaluated for economic feasibility. The avoided costs for capacity and energy calculated in the supply side resource evaluation were used to calculate the costs and benefits of each DSM measure.

Much of the DSM screening utilized information from the WAPA Resource Planning Guide (RPG). The RPG provided a process for evaluating DSM measures and provided reference data for use in the economic evaluation of DSM measures.

Qualitative Screening

The DSM technologies which satisfy NCU's load shape objectives were subjected to qualitative screening. The qualitative screening involved the use of six criteria, called "second tier criteria," to identify those technologies most relevant to NCU's objectives. According to the RPG, the second tier criteria are:

- **Costs:** This includes start-up, marketing and equipment costs.
- **Customer Preferences:** A customer's acceptance of a technology is determined by such factors as the customer's cost perspective, comfort level with the technology, and willingness to use the measure.
- **Environmental Impacts:** DSM technologies can postpone the need to add supply-side resources that emit pollutants into the environment, but some DSM measures also have environmental impacts. For example, hazardous waste disposal will be an issue when disposing of old refrigerator compressors containing CFC's.
- **Market Potential:** In order for the program to realize its maximum potential, intended markets and end-uses must be identified.
- **Ease of Implementation:** A program's success will be heavily dependent on the relative ease of implementation. Some programs may require the simple replacement of lights or appliances, while others require major changes in the building structure.
- **Availability:** The DSM technology must be commercially available and reliable.

All technologies were scored from 0 to 3 according to their ability to satisfy each of the preceding criteria. Those technologies with higher total scores were considered to be more successful in achieving NCU's load shape objectives than those with lower scores. Tables 4 and 5 (page 20) show the scores for each technology applicable to a particular customer class.

Table 4
Qualitative Screening
Residential Demand Side Measures

Technology Alternative	Cost	Customer Preference	Environmental Impact	Market Potential	Ease of Implementation	Commercial Availability/Reliability	Total
Central Air Conditioning Load Cycling	2	2	2	3	2	3	14
Electric Water Heater Load Shedding	2	3	3	1	3	3	15
High Efficiency Central Air Conditioners	2	3	3	3	2	3	16
Room and Window Air Conditioner Rebates	3	3	3	3	3	3	18
High Efficiency Refrigerator Rebate Program	3	3	3	3	3	3	18
Old Refrigerator Pick-up Program	3	2	3	3	3	3	17
Improved Home Loan Program for Furnace & AC Replacement	2	3	3	3	3	3	17
Energy-Efficient New Home	1	2	3	2	2	2	12
Energy-Efficient Existing Home	1	2	3	2	2	2	12
Tree Planting Program	2	2	3	2	2	3	14

Table 5
Qualitative Screening
Commercial/Industrial Demand Side Measures

Technology Alternative	Cost	Customer Preference	Environmental Impact	Market Potential	Ease of Implementation	Commercial Availability/Reliability	Total
Commercial High-Efficiency Lighting	3	3	2	2	3	3	16
Commercial High-Efficiency Air Conditioners	1	3	3	2	3	3	15
Commercial HVAC Efficiency Improvement Program	2	3	3	2	3	3	16
Large Customer Customized Rebate Program	2	3	3	2	2	3	15
Interruptible Rates	3	3	3	1	1	3	14

All applicable technologies were ranked from high to low for each customer class. NCU then selected 15 technologies for further evaluation. The measures that passed the qualitative screening included 10 residential measures, and five commercial/industrial measures. This pre-screening only used qualitative factors to narrow the list of technologies that would be further evaluated. The 15 measures were then subjected to an economic evaluation.

Economic Evaluation

Once the technical data for each DSM measure was collected, an economic evaluation was completed. The projected annual cost for each measure was compared to the projected power cost savings to calculate the net present value of the cost or savings of each measure.

The following assumptions were used in the economic evaluation:

- The evaluation was done on a “per-unit” basis, meaning the analysis evaluated one installation of the given measure.
- Technical information for the measures was based on past experience, when possible. When information from past experience was not available, the RPG Reference Data for the Southern Region was used.
- Avoided demand and energy costs from the Supply Side Resource Evaluation were used. It was assumed that peak demand savings were used to reduce seasonal capacity purchases, with the summer season being defined as June-September, and the winter season as October-May.
- A discount rate of 5.0% was used.
- The Total Resource Cost (TRC) test was used. This compared the total costs of the measure, including costs incurred by NCU or the end user, to the total cost savings realized by NCU.

Using these assumptions, the 15 DSM measures were evaluated over a ten-year study period. The evaluation considered all of the installation, operational and maintenance, and administrative and general expenses that would be incurred over the ten-year period. The expenses were compared to NCU's avoided capacity and energy cost. The net cost or savings to NCU was calculated on an annual basis and discounted to 2007 Dollars. Measures with a positive net present value were considered economically feasible. A summary of the economic evaluations is shown in Table 6. The analysis of each individual DSM measure is shown in Appendix A.

Table 6
Summary of DSM Measures
Projected Costs and Savings
(2007 \$)

DSM Measure	Present Value of Annual Savings (Costs) per unit (1)
<u>Residential</u>	
Central Air Conditioning Load Cycling	(\$170.57)
Electric Water Heater Load Shedding	(\$212.34)
High Efficiency Central Air Conditioners	(\$14.38)
Room and Window Air Conditioner Rebates	(\$58.47)
High Efficiency Refrigerator Rebate Program	(\$86.19)
Old Refrigerator Pick-up Program	(\$5.30)
Improved Home Loan Program for Furnace & AC replacement	(\$708.49)
Energy-Efficient New Home	(\$615.51)
Energy-Efficient Existing Home	(\$1,175.51)
Tree Planting Program	(\$122.47)
<u>Commercial/Industrial</u>	
Commercial High-Efficiency Lighting	(\$15.36)
Commercial High-Efficiency Air Conditioners	(\$59.68)
Commercial HVAC Efficiency Improvement Program	(\$294.75)
Large Customer Customized Rebate Program	(\$199.39)
Interruptible Rates	\$6,604.97

It appears the only DSM measure that is economically feasible is interruptible rates, primarily because NCU's wholesale costs are very competitive. Interruptible rates provide a lot of impact for relatively low cost. As part of NCU's most recent cost of service study there was some investigation of interruptible rates, but there was insufficient interest from potential customers.

NCU should continue low-cost DSM options, such as promoting energy efficiency via the NCU website, customer flyers and a message line on monthly bills which can include energy conservation messages. NCU should also continue the tree planting program, as it is already established and popular with customers.

Section V: Supply/Demand Side Resource Integration

Development of Integrated Resource Plan

Least cost supply resources were combined to develop four cases. These cases and associated costs were developed by the Nebraska Municipal Power Pool (NMPP). Each of the cases includes the projected base load growth rate for demand, which is 1.5% – 2.0% per year. Table 7 summarizes the Present Value Costs Analysis (in 2009 dollars) through the period 2018.

**Table 7
Present Value Cost Analysis**

Case	Case Description	Total Present Value 2009 through 2018 in 2009 dollars (\$000)
Base Case	Existing resources and non-firm energy purchases through 2010	[REDACTED]
Case 1	Existing resources plus extension of OPPD contract for one year	[REDACTED]
Case 1a	Existing resources plus extension of OPPD contract through 2019	[REDACTED]
Case 2	Existing resources plus an additional 2 MW of WEC2	[REDACTED]

- **Base Case**

The Base Case involved existing resources and non-firm energy purchases through 2010. The present value for the Base Case was calculated as [REDACTED] and ranked fourth among the four cases.

- **Case 1**

Case 1 involved existing resources plus the extension of the OPPD contract for one year. The present value for Case 1 was calculated as [REDACTED] and ranked second among the four cases.

- **Case 1a**

Case 1a is similar to case one with existing resources plus the extension of the OPPD contract through 2019. The present value for Case 1a was calculated as [REDACTED] and ranked first among the four cases.

- **Case 2**

Case 2 involved existing resources plus an additional two MW of WEC2. The present value for Case 2 was calculated as [REDACTED] and ranked third among the four cases. Although Case 2's present value costs for the period were higher than the Case 1 and Case 1a, by 2018 it appears that additional baseload capacity may be economical.

Preferred Alternative

Based on the analyses prepared, it appears NCU should take the following steps:

- Work to extend the OPPD contract at least through 2011. If possible, NCU should work to extend the contract even longer, depending on terms and conditions.
- Based on load growth, NCU should expect a need for baseload resources in the 2018-2019 timeframe.

Environmental Impact

- The city complies with applicable provisions of the Clean Air Act and Clean Water Act at its power plants.
- The tree planting program offsets emissions and is an effective measure for CO2 sequestration.
- Proposed projects will include Best Available Control Technology (BACT) to help reduce environmental impacts.
- Encouraging DSM through no cost or low cost methods will reduce energy usage and emissions.

Section VI: Action Plans

Based on the assumptions used, analyses completed and conclusions reached, the following action plans are recommended.

Two Year Action Plan

Based on the assumptions used, analyses completed and conclusions reached in this study, the following Two Year Action Plan is recommended. To the extent that resources, DSM and transmission costs change, NCU should review and modify this action plan accordingly.

- NCU has signed a Participation Agreement with OPPD for approximately 11 MW of participation in the 663 MW coal-fired generation unit to be built in Nebraska City, Nebraska. This unit is scheduled to come on line in 2009.
- NCU has signed a Participation Agreement with PPGA for 10 MW of participation in the 220 MW coal-fired generation unit to be built at Whelan Energy Center in Hastings, Nebraska. This unit is scheduled to come on line in 2011.
- The OPPD contract was extended until April 30, 2010. NCU will pursue extension to 2011 and beyond.
- Continue to promote the National Arbor Day Foundation's 10 free trees and the "Right Tree in the Right Place" program that is designed to strategically place trees for reducing future air conditioning costs.
- Continue to investigate partnerships with the Nebraska Energy Office (NEO) for viable programs such as energy saving loans. NCU promotes partnerships with the NEO via a link on its website.

- Continue low cost DSM programs such as promotion of energy efficiency via the NCU website.
- Consider purchases of renewable energy based on customer interest. At this time, there is not significant interest from customers to purchase wind energy; however, NCU will continue to monitor customer interest through annual customer surveys.

Five Year Action Plan

Based on the assumptions used, analyses completed and conclusions reached in this study, the following Five Year Action Plan is recommended. To the extent that resources, DSM and transmission costs change, NCU should review and modify this action plan accordingly.

- Continuation of Two Year Action Plan.
- Review other options as they become available.

Public Participation

Part of the IRP implementation process involves public participation. NCU has involved the public in developing the IRP, and will continue to solicit public participation as it implements the IRP.

The Integrated Resource Plan was presented in a public hearing to the NCU Board of Public Works on April 3, 2007. The purpose of this hearing was to provide information to and gather input from groups and individuals with an interest in NCU's Integrated Resource Plan. A Notice of the public hearing appeared in Nebraska City's local newspaper and was posted at the NCU office. Attendees of the public hearing included Leroy Frana, Jeff Kohrs, Tom Liesemeyer and Dan Patton, Nebraska City Utilities; Erwin Friesen, Public Works Commissioner; Jeanette Eilers, Jack Hobbie, John James and Dennis Marshall, Nebraska City Board of Public Works; John Tresek, Ameritas; Jill Jones and John Krajewski, NMPP. There were no members of the general public present.

Items of discussion involved power supply options and issues. At the conclusion of the public hearing, the IRP was approved by the Board of Public Works with the recommendation to the City Commission to approve the IRP.

Validation of Predicted Performance

NCU compares its load forecasts to actual usage on an annual and monthly basis. This comparison will be continually updated in the future. In addition, NCU will continue to verify the effectiveness of demand-side measures in its annual progress reports to this IRP.

Annual Progress Reports

Annual progress reports to this IRP will be prepared. The annual reports will provide comparisons of actual and predicted power supply costs, comparisons of actual and projected demand-side management activity and planned changes in power supply resources or demand-side management measures. The annual reports will also identify changes to the IRP. Changes to the IRP may be caused by load changes or changes in the costs of purchased power or demand-side measures.

Appendix A: Economic Analysis of Demand Side Measures

Appendix A
Impact of DSM Alternatives
Residential Central Air Conditioning Load Cycling

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.85	0.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			10
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	59.00%	59.00%	59.00%
Market Eligibility	40.00%	40.00%	40.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	1,103	1,103	1,103
Total Demand or Energy Savings (kW or kWh)	938	0	11,030

Estimated Installation Cost per Unit \$225.55
 Estimated Annual Maintenance Cost per Unit \$9.87
 Measure Life 25 Years

Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.85	0.00	10	\$4.50	\$0.00	\$45.00	\$15.75
2008	0.85	0.00	10	\$4.55	\$0.00	\$46.35	\$15.92
2009	0.85	0.00	10	\$4.59	\$0.00	\$47.74	\$16.08
2010	0.85	0.00	10	\$4.64	\$0.00	\$49.17	\$16.26
2011	0.85	0.00	10	\$4.68	\$0.00	\$50.65	\$16.43
2012	0.85	0.00	10	\$4.73	\$0.00	\$52.17	\$16.60
2013	0.85	0.00	10	\$4.78	\$0.00	\$53.74	\$16.78
2014	0.85	0.00	10	\$4.82	\$0.00	\$55.35	\$16.96
2015	0.85	0.00	10	\$4.87	\$0.00	\$57.01	\$17.14
2016	0.85	0.00	10	\$4.92	\$0.00	\$58.72	\$17.32

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$225.55	\$15.75	(\$209.80)	(\$209.80)
2008	\$9.87	\$15.92	\$6.05	\$5.76
2009	\$10.17	\$16.08	\$5.91	\$5.36
2010	\$10.48	\$16.26	\$5.78	\$4.99
2011	\$10.79	\$16.43	\$5.64	\$4.64
2012	\$11.11	\$16.60	\$5.49	\$4.30
2013	\$11.44	\$16.78	\$5.34	\$3.98
2014	\$11.78	\$16.96	\$5.18	\$3.68
2015	\$12.13	\$17.14	\$5.01	\$3.39
2016	<u>\$12.49</u>	<u>\$17.32</u>	<u>\$4.83</u>	<u>\$3.11</u>
Total	\$325.81	\$165.24	(\$160.57)	(\$170.57)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Residential Electric Water Heater Load Shedding

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.45	0.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			5
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	15.00%	15.00%	15.00%
Market Eligibility	50.00%	50.00%	50.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	351	351	351
Total Demand or Energy Savings (kW or kWh)	158	0	1,755

Estimated Installation Cost per Unit \$208.87
 Estimated Annual Maintenance Cost per Unit \$9.19
 Measure Life 25 Years

Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.45	0.00	5	\$4.50	\$0.00	\$24.15	\$8.22
2008	0.45	0.00	5	\$4.55	\$0.00	\$24.96	\$8.31
2009	0.45	0.00	5	\$4.59	\$0.00	\$24.96	\$8.39
2010	0.45	0.00	5	\$4.64	\$0.00	\$27.00	\$8.48
2011	0.45	0.00	5	\$4.68	\$0.00	\$27.68	\$8.57
2012	0.45	0.00	5	\$4.73	\$0.00	\$28.37	\$8.66
2013	0.45	0.00	5	\$4.78	\$0.00	\$29.08	\$8.74
2014	0.45	0.00	5	\$4.82	\$0.00	\$29.81	\$8.83
2015	0.45	0.00	5	\$4.87	\$0.00	\$30.56	\$8.92
2016	0.45	0.00	5	\$4.92	\$0.00	\$31.32	\$9.02

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$208.87	\$8.22	(\$200.65)	(\$200.65)
2008	\$9.19	\$8.31	(\$0.88)	(\$0.84)
2009	\$9.47	\$8.39	(\$1.08)	(\$0.98)
2010	\$9.75	\$8.48	(\$1.27)	(\$1.10)
2011	\$10.04	\$8.57	(\$1.47)	(\$1.21)
2012	\$10.34	\$8.66	(\$1.68)	(\$1.32)
2013	\$10.65	\$8.74	(\$1.91)	(\$1.43)
2014	\$10.97	\$8.83	(\$2.14)	(\$1.52)
2015	\$11.30	\$8.92	(\$2.38)	(\$1.61)
2016	<u>\$11.64</u>	<u>\$9.02</u>	<u>(\$2.62)</u>	<u>(\$1.69)</u>
Total	\$302.22	\$86.14	(\$216.08)	(\$212.34)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Residential High Efficiency Central Air Conditioners

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.90	0.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			500
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	59.00%	59.00%	59.00%
Market Eligibility	50.00%	50.00%	50.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	1,379	1,379	1,379
Total Demand or Energy Savings (kW or kWh)	1,241	0	689,500

Estimated Installation Cost per Unit \$331.30
 Estimated Annual Maintenance Cost per Unit \$1.68
 Measure Life 20 Years

Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.9	0.00	500	\$4.50	\$0.00	\$45.00	\$39.38
2008	0.9	0.00	500	\$4.55	\$0.00	\$46.35	\$40.23
2009	0.9	0.00	500	\$4.59	\$0.00	\$47.74	\$41.11
2010	0.9	0.00	500	\$4.64	\$0.00	\$49.17	\$42.01
2011	0.9	0.00	500	\$4.68	\$0.00	\$50.65	\$42.94
2012	0.9	0.00	500	\$4.73	\$0.00	\$52.17	\$43.89
2013	0.9	0.00	500	\$4.78	\$0.00	\$53.73	\$44.87
2014	0.9	0.00	500	\$4.82	\$0.00	\$55.34	\$45.87
2015	0.9	0.00	500	\$4.87	\$0.00	\$57.00	\$46.90
2016	0.9	0.00	500	\$4.92	\$0.00	\$58.71	\$47.92

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$331.30	\$39.38	(\$291.92)	(\$291.92)
2008	\$1.68	\$40.23	\$38.55	\$36.71
2009	\$1.73	\$41.11	\$39.38	\$35.72
2010	\$1.78	\$42.01	\$40.23	\$34.75
2011	\$1.83	\$42.94	\$41.11	\$33.82
2012	\$1.88	\$43.89	\$42.01	\$32.92
2013	\$1.94	\$44.87	\$42.93	\$32.04
2014	\$2.00	\$45.87	\$43.87	\$31.18
2015	\$2.06	\$46.90	\$44.84	\$30.35
2016	<u>\$2.12</u>	<u>\$47.92</u>	<u>\$45.80</u>	<u>\$29.52</u>
Total	\$348.32	\$404.92	\$56.60	(\$14.38)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Residential Room and Window Air Conditioner Rebates

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.138	0.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			103
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	33.00%	33.00%	33.00%
Market Eligibility	15.00%	15.00%	15.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	231	231	231
Total Demand or Energy Savings (kW or kWh)	32	0	23,793

Estimated Installation Cost per Unit \$102.04
 Estimated Annual Maintenance Cost per Unit \$2.51
 Measure Life 13 Years

Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.138	0.00	103	\$4.50	\$0.00	\$45.00	\$7.12
2008	0.138	0.00	103	\$4.55	\$0.00	\$46.35	\$7.28
2009	0.138	0.00	103	\$4.59	\$0.00	\$47.74	\$7.45
2010	0.138	0.00	103	\$4.64	\$0.00	\$49.17	\$7.62
2011	0.138	0.00	103	\$4.68	\$0.00	\$50.65	\$7.80
2012	0.138	0.00	103	\$4.73	\$0.00	\$52.17	\$7.98
2013	0.138	0.00	103	\$4.78	\$0.00	\$53.73	\$8.17
2014	0.138	0.00	103	\$4.82	\$0.00	\$55.34	\$8.36
2015	0.138	0.00	103	\$4.87	\$0.00	\$57.00	\$8.56
2016	0.138	0.00	103	\$4.92	\$0.00	\$58.71	\$8.76

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$102.04	\$7.12	(\$94.92)	(\$94.92)
2008	\$2.51	\$7.28	\$4.77	\$4.54
2009	\$2.59	\$7.45	\$4.86	\$4.41
2010	\$2.67	\$7.62	\$4.95	\$4.28
2011	\$2.75	\$7.80	\$5.05	\$4.15
2012	\$2.83	\$7.98	\$5.15	\$4.04
2013	\$2.91	\$8.17	\$5.26	\$3.93
2014	\$3.00	\$8.36	\$5.36	\$3.81
2015	\$3.09	\$8.56	\$5.47	\$3.70
2016	<u>\$3.18</u>	<u>\$8.76</u>	<u>\$5.58</u>	<u>\$3.60</u>
Total	\$127.57	\$79.10	(\$48.47)	(\$58.47)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
High Efficiency Refrigerator Rebate Program

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.082	0.082	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			519
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	15.00%	15.00%	15.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	701	701	701
Total Demand or Energy Savings (kW or kWh)	57	57	363,819

Estimated Installation Cost per Unit \$188.59
 Estimated Annual Maintenance Cost per Unit \$3.22
 Measure Life 10 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.082	0.08	519	\$4.50	\$0.00	\$24.15	\$14.01
2008	0.082	0.08	519	\$4.55	\$0.00	\$24.96	\$14.45
2009	0.082	0.08	519	\$4.59	\$0.00	\$24.96	\$14.46
2010	0.082	0.08	519	\$4.64	\$0.00	\$27.00	\$15.53
2011	0.082	0.08	519	\$4.68	\$0.00	\$27.68	\$15.90
2012	0.082	0.08	519	\$4.73	\$0.00	\$28.37	\$16.28
2013	0.082	0.08	519	\$4.78	\$0.00	\$29.08	\$16.66
2014	0.082	0.08	519	\$4.82	\$0.00	\$29.81	\$17.05
2015	0.082	0.08	519	\$4.87	\$0.00	\$30.56	\$17.46
2016	0.082	0.08	519	\$4.92	\$0.00	\$31.32	\$17.87

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$188.59	\$14.01	(\$174.58)	(\$174.58)
2008	\$3.22	\$14.45	\$11.23	\$10.70
2009	\$3.32	\$14.46	\$11.14	\$10.10
2010	\$3.42	\$15.53	\$12.11	\$10.46
2011	\$3.52	\$15.90	\$12.38	\$10.19
2012	\$3.63	\$16.28	\$12.65	\$9.91
2013	\$3.74	\$16.66	\$12.92	\$9.64
2014	\$3.85	\$17.05	\$13.20	\$9.38
2015	\$3.97	\$17.46	\$13.49	\$9.13
2016	<u>\$4.09</u>	<u>\$17.87</u>	<u>\$13.78</u>	<u>\$8.88</u>
Total	\$221.35	\$159.67	(\$61.68)	(\$86.19)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Old Refrigerator Pick-up Program

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.065	0.065	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			410
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	15.00%	15.00%	15.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	701	701	701
Total Demand or Energy Savings (kW or kWh)	46	46	287,410

Estimated Installation Cost per Unit \$151.27
 Estimated Annual Maintenance Cost per Unit \$2.48
 Measure Life 10 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.065	0.07	410	\$4.50	\$0.00	\$24.15	\$11.07
2008	0.065	0.07	410	\$4.55	\$0.00	\$24.96	\$11.42
2009	0.065	0.07	410	\$4.59	\$0.00	\$24.96	\$11.43
2010	0.065	0.07	410	\$4.64	\$0.00	\$54.16	\$23.41
2011	0.065	0.07	410	\$4.68	\$0.00	\$55.79	\$24.09
2012	0.065	0.07	410	\$4.73	\$0.00	\$57.46	\$24.79
2013	0.065	0.07	410	\$4.78	\$0.00	\$59.18	\$25.51
2014	0.065	0.07	410	\$4.82	\$0.00	\$60.96	\$26.25
2015	0.065	0.07	410	\$4.87	\$0.00	\$62.79	\$27.01
2016	0.065	0.07	410	\$4.92	\$0.00	\$64.67	\$27.79

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$151.27	\$11.07	(\$140.20)	(\$140.20)
2008	\$2.48	\$11.42	\$8.94	\$8.51
2009	\$2.55	\$11.43	\$8.88	\$8.05
2010	\$2.63	\$23.41	\$20.78	\$17.95
2011	\$2.71	\$24.09	\$21.38	\$17.59
2012	\$2.79	\$24.79	\$22.00	\$17.24
2013	\$2.87	\$25.51	\$22.64	\$16.89
2014	\$2.96	\$26.25	\$23.29	\$16.55
2015	\$3.05	\$27.01	\$23.96	\$16.22
2016	<u>\$3.14</u>	<u>\$27.79</u>	<u>\$24.65</u>	<u>\$15.89</u>
Total	\$176.45	\$212.77	\$36.32	(\$5.30)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Improved Home Loan Program for Furnace & AC Replacement

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	1.00	1.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			500
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	5.80%	5.80%	5.80%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	271	271	271
Total Demand or Energy Savings (kW or kWh)	271	271	135,500

Estimated Installation Cost per Unit \$982.53
Estimated Annual Maintenance Cost per Unit \$8.56
Measure Life 20 Years
Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	1	1.00	500	\$4.50	\$0.00	\$24.15	\$30.08
2008	1	1.00	500	\$4.55	\$0.00	\$24.96	\$30.66
2009	1	1.00	500	\$4.59	\$0.00	\$24.96	\$30.84
2010	1	1.00	500	\$4.64	\$0.00	\$54.16	\$45.63
2011	1	1.00	500	\$4.68	\$0.00	\$55.79	\$46.63
2012	1	1.00	500	\$4.73	\$0.00	\$57.46	\$47.65
2013	1	1.00	500	\$4.78	\$0.00	\$59.18	\$48.70
2014	1	1.00	500	\$4.82	\$0.00	\$60.96	\$49.78
2015	1	1.00	500	\$4.87	\$0.00	\$62.79	\$50.89
2016	1	1.00	500	\$4.92	\$0.00	\$64.67	\$52.02

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$982.53	\$30.08	(\$952.45)	(\$952.45)
2008	\$8.56	\$30.66	\$22.10	\$21.05
2009	\$8.82	\$30.84	\$22.02	\$19.97
2010	\$9.08	\$45.63	\$36.55	\$31.57
2011	\$9.35	\$46.63	\$37.28	\$30.67
2012	\$9.63	\$47.65	\$38.02	\$29.79
2013	\$9.92	\$48.70	\$38.78	\$28.94
2014	\$10.22	\$49.78	\$39.56	\$28.11
2015	\$10.53	\$50.89	\$40.36	\$27.32
2016	<u>\$10.85</u>	<u>\$52.02</u>	<u>\$41.17</u>	<u>\$26.54</u>
Total	\$1,069.49	\$432.88	(\$636.61)	(\$708.49)

Footnote #1
Footnote #2
Footnote #3
Footnote #4

**Appendix A
Impact of DSM Alternatives
Energy-Efficient New Home**

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.80	0.80	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			600
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	3.00%	3.00%	3.00%
Market Eligibility	100.00%	100.00%	100.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	140	140	140
Total Demand or Energy Savings (kW or kWh)	112	112	84,000

Estimated Installation Cost per Unit \$833.52
 Estimated Annual Maintenance Cost per Unit \$16.56
 Measure Life 25 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.8	0.80	600	\$4.50	\$0.00	\$24.15	\$28.89
2008	0.8	0.80	600	\$4.55	\$0.00	\$24.96	\$29.52
2009	0.8	0.80	600	\$4.59	\$0.00	\$24.96	\$29.67
2010	0.8	0.80	600	\$4.64	\$0.00	\$54.16	\$47.33
2011	0.8	0.80	600	\$4.68	\$0.00	\$55.79	\$48.46
2012	0.8	0.80	600	\$4.73	\$0.00	\$57.46	\$49.61
2013	0.8	0.80	600	\$4.78	\$0.00	\$59.18	\$50.79
2014	0.8	0.80	600	\$4.82	\$0.00	\$60.96	\$52.01
2015	0.8	0.80	600	\$4.87	\$0.00	\$62.79	\$53.27
2016	0.8	0.80	600	\$4.92	\$0.00	\$64.67	\$54.55

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$833.52	\$28.89	(\$804.63)	(\$804.63)
2008	\$16.56	\$29.52	\$12.96	\$12.34
2009	\$17.06	\$29.67	\$12.61	\$11.44
2010	\$17.57	\$47.33	\$29.76	\$25.71
2011	\$18.10	\$48.46	\$30.36	\$24.98
2012	\$18.64	\$49.61	\$30.97	\$24.27
2013	\$19.20	\$50.79	\$31.59	\$23.57
2014	\$19.78	\$52.01	\$32.23	\$22.91
2015	\$20.37	\$53.27	\$32.90	\$22.27
2016	<u>\$20.98</u>	<u>\$54.55</u>	<u>\$33.57</u>	<u>\$21.64</u>
Total	\$1,001.78	\$444.10	(\$557.68)	(\$615.51)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Energy-Efficient Existing Home

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	1.00	1.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			800
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	50.00%	50.00%	50.00%
Market Eligibility	8.00%	8.00%	8.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	187	187	187
Total Demand or Energy Savings (kW or kWh)	187	187	149,600

Estimated Installation Cost per Unit \$1,557.60
 Estimated Annual Maintenance Cost per Unit \$9.30
 Measure Life 20 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	1	1.00	800	\$4.50	\$0.00	\$24.15	\$37.32
2008	1	1.00	800	\$4.55	\$0.00	\$24.96	\$38.15
2009	1	1.00	800	\$4.59	\$0.00	\$24.96	\$38.33
2010	1	1.00	800	\$4.64	\$0.00	\$54.16	\$61.87
2011	1	1.00	800	\$4.68	\$0.00	\$55.79	\$63.36
2012	1	1.00	800	\$4.73	\$0.00	\$57.46	\$64.89
2013	1	1.00	800	\$4.78	\$0.00	\$59.18	\$66.45
2014	1	1.00	800	\$4.82	\$0.00	\$60.96	\$68.07
2015	1	1.00	800	\$4.87	\$0.00	\$62.79	\$69.72
2016	1	1.00	800	\$4.92	\$0.00	\$64.67	\$71.42

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$1,557.60	\$37.32	(\$1,520.28)	(\$1,520.28)
2008	\$9.30	\$38.15	\$28.85	\$27.48
2009	\$9.58	\$38.33	\$28.75	\$26.08
2010	\$9.87	\$61.87	\$52.00	\$44.92
2011	\$10.17	\$63.36	\$53.19	\$43.76
2012	\$10.48	\$64.89	\$54.41	\$42.63
2013	\$10.79	\$66.45	\$55.66	\$41.53
2014	\$11.11	\$68.07	\$56.96	\$40.48
2015	\$11.44	\$69.72	\$58.28	\$39.45
2016	<u>\$11.78</u>	<u>\$71.42</u>	<u>\$59.64</u>	<u>\$38.44</u>
Total	\$1,652.12	\$579.58	(\$1,072.54)	(\$1,175.51)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Residential Tree Planting Program

DSM Technology Residential	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	0.25		
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			111
Estimated Residential Customers	4,675	4,675	4,675
Estimated Appliance Saturation	5.80%	5.80%	5.80%
Market Eligibility	85.00%	85.00%	85.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	230	230	230
Total Demand or Energy Savings (kW or kWh)	58	0	25530

Estimated Installation Cost per Unit \$182.60
 Estimated Annual Maintenance Cost per Unit \$2.52
 Measure Life 30 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Annual Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	0.25	0.00	111	\$4.50	\$0.00	\$24.15	\$7.18
2008	0.25	0.00	111	\$4.55	\$0.00	\$24.96	\$7.32
2009	0.25	0.00	111	\$4.59	\$0.00	\$24.96	\$7.36
2010	0.25	0.00	111	\$4.64	\$0.00	\$54.16	\$10.65
2011	0.25	0.00	111	\$4.68	\$0.00	\$55.79	\$10.88
2012	0.25	0.00	111	\$4.73	\$0.00	\$57.46	\$11.11
2013	0.25	0.00	111	\$4.78	\$0.00	\$59.18	\$11.35
2014	0.25	0.00	111	\$4.82	\$0.00	\$60.96	\$11.59
2015	0.25	0.00	111	\$4.87	\$0.00	\$62.79	\$11.84
2016	0.25	0.00	111	\$4.92	\$0.00	\$64.67	\$12.10

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$182.60	\$7.18	(\$175.42)	(\$175.42)
2008	\$2.52	\$7.32	\$4.80	\$4.57
2009	\$2.60	\$7.36	\$4.76	\$4.32
2010	\$2.68	\$10.65	\$7.97	\$6.88
2011	\$2.76	\$10.88	\$8.12	\$6.68
2012	\$2.84	\$11.11	\$8.27	\$6.48
2013	\$2.93	\$11.35	\$8.42	\$6.28
2014	\$3.02	\$11.59	\$8.57	\$6.09
2015	\$3.11	\$11.84	\$8.73	\$5.91
2016	<u>\$3.20</u>	<u>\$12.10</u>	<u>\$8.90</u>	<u>\$5.74</u>
Total	\$208.26	\$101.38	(\$106.88)	(\$122.47)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Commercial High-Efficiency Lighting

DSM Technology Commercial	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	4.00	4.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			13000
Estimated Commercial Customers	894	894	894
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	20.00%	20.00%	20.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	179	179	179
Total Demand or Energy Savings (kW or kWh)	716	716	2,327,000

Estimated Installation Cost per Unit \$3,319.38
 Estimated Annual Maintenance Cost per Unit \$25.00
 Measure Life 15 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	4.00	4.00	13000	\$4.50	\$0.00	\$24.15	\$385.95
2008	4.00	4.00	13000	\$4.55	\$0.00	\$24.96	\$397.20
2009	4.00	4.00	13000	\$4.59	\$0.00	\$24.96	\$397.93
2010	4.00	4.00	13000	\$4.64	\$0.00	\$27.00	\$425.18
2011	4.00	4.00	13000	\$4.68	\$0.00	\$27.68	\$434.76
2012	4.00	4.00	13000	\$4.73	\$0.00	\$28.37	\$444.48
2013	4.00	4.00	13000	\$4.78	\$0.00	\$29.08	\$454.47
2014	4.00	4.00	13000	\$4.82	\$0.00	\$29.81	\$464.72
2015	4.00	4.00	13000	\$4.87	\$0.00	\$30.56	\$475.25
2016	4.00	4.00	13000	\$4.92	\$0.00	\$31.32	\$485.91

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$3,319.38	\$385.95	(\$2,933.43)	(\$2,933.43)
2008	\$25.00	\$397.20	\$372.20	\$354.48
2009	\$25.75	\$397.93	\$372.18	\$337.58
2010	\$26.52	\$425.18	\$398.66	\$344.38
2011	\$27.32	\$434.76	\$407.44	\$335.20
2012	\$28.14	\$444.48	\$416.34	\$326.21
2013	\$28.98	\$454.47	\$425.49	\$317.51
2014	\$29.85	\$464.72	\$434.87	\$309.05
2015	\$30.75	\$475.25	\$444.50	\$300.86
2016	<u>\$31.67</u>	<u>\$485.91</u>	<u>\$454.24</u>	<u>\$292.81</u>
Total	\$3,573.36	\$4,365.85	\$792.49	(\$15.36)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Commercial High-Efficiency Air Conditioners

DSM Technology Commercial	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	2.00		
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			2500
Estimated Commercial Customers	867	867	867
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	25.00%	25.00%	25.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	217	217	217
Total Demand or Energy Savings (kW or kWh)	434	0	542,500

Estimated Installation Cost per Unit \$1,242.32
 Estimated Annual Maintenance Cost per Unit \$8.98
 Measure Life 20 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Annual Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	2	0.00	2500	\$4.50	\$0.00	\$24.15	\$96.38
2008	2	0.00	2500	\$4.55	\$0.00	\$24.96	\$98.76
2009	2	0.00	2500	\$4.59	\$0.00	\$24.96	\$99.12
2010	2	0.00	2500	\$4.64	\$0.00	\$54.16	\$172.49
2011	2	0.00	2500	\$4.68	\$0.00	\$55.79	\$176.94
2012	2	0.00	2500	\$4.73	\$0.00	\$57.46	\$181.49
2013	2	0.00	2500	\$4.78	\$0.00	\$59.18	\$186.16
2014	2	0.00	2500	\$4.82	\$0.00	\$60.96	\$191.00
2015	2	0.00	2500	\$4.87	\$0.00	\$62.79	\$195.96
2016	2	0.00	2500	\$4.92	\$0.00	\$64.67	\$201.05

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$1,242.32	\$96.38	(\$1,145.94)	(\$1,145.94)
2008	\$8.98	\$98.76	\$89.78	\$85.50
2009	\$9.25	\$99.12	\$89.87	\$81.51
2010	\$9.53	\$172.49	\$162.96	\$140.77
2011	\$9.82	\$176.94	\$167.12	\$137.49
2012	\$10.11	\$181.49	\$171.38	\$134.28
2013	\$10.41	\$186.16	\$175.75	\$131.15
2014	\$10.72	\$191.00	\$180.28	\$128.12
2015	\$11.04	\$195.96	\$184.92	\$125.16
2016	\$11.37	\$201.05	\$189.68	\$122.27
Total	\$1,333.55	\$1,599.35	\$265.80	(\$59.68)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Commercial HVAC Efficiency Improvement Program

DSM Technology Commercial	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	5.00	5.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			8750
Estimated Commercial Customers	27	27	27
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	33.00%	33.00%	33.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	9	9	9
Total Demand or Energy Savings (kW or kWh)	45	45	78,750

Estimated Installation Cost per Unit \$2,624.63
 Estimated Annual Maintenance Cost per Unit \$257.62
 Measure Life 20 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Annual Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	5	5.00	8750	\$4.50	\$0.00	\$45.00	\$483.75
2008	5	5.00	8750	\$4.55	\$0.00	\$46.35	\$496.46
2009	5	5.00	8750	\$4.59	\$0.00	\$47.74	\$509.53
2010	5	5.00	8750	\$4.64	\$0.00	\$49.17	\$522.96
2011	5	5.00	8750	\$4.68	\$0.00	\$50.65	\$536.84
2012	5	5.00	8750	\$4.73	\$0.00	\$52.17	\$551.08
2013	5	5.00	8750	\$4.78	\$0.00	\$53.74	\$565.76
2014	5	5.00	8750	\$4.82	\$0.00	\$55.35	\$580.80
2015	5	5.00	8750	\$4.87	\$0.00	\$57.01	\$596.29
2016	5	5.00	8750	\$4.92	\$0.00	\$58.72	\$612.23

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$2,624.63	\$483.75	(\$2,140.88)	(\$2,140.88)
2008	\$257.62	\$496.46	\$238.84	\$227.47
2009	\$265.35	\$509.53	\$244.18	\$221.48
2010	\$273.31	\$522.96	\$249.65	\$215.66
2011	\$281.51	\$536.84	\$255.33	\$210.06
2012	\$289.96	\$551.08	\$261.12	\$204.59
2013	\$298.66	\$565.76	\$267.10	\$199.31
2014	\$307.62	\$580.80	\$273.18	\$194.14
2015	\$316.85	\$596.29	\$279.44	\$189.14
2016	<u>\$326.36</u>	<u>\$612.23</u>	<u>\$285.87</u>	<u>\$184.27</u>
Total	\$5,241.87	\$5,455.70	\$213.83	(\$294.75)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

Appendix A
Impact of DSM Alternatives
Large Customer Customized Rebate Program

DSM Technology Commercial	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	5.00	5.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			8750
Estimated Commercial Customers	894	894	894
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	5.00%	5.00%	5.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	45	45	45
Total Demand or Energy Savings (kW or kWh)	225	225	393,750

Estimated Installation Cost per Unit \$3,670.09
 Estimated Annual Maintenance Cost per Unit \$77.28
 Measure Life 15 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Annual Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	5	5.00	8750	\$4.50	\$0.00	\$24.15	\$301.31
2008	5	5.00	8750	\$4.55	\$0.00	\$24.96	\$309.30
2009	5	5.00	8750	\$4.59	\$0.00	\$24.96	\$310.21
2010	5	5.00	8750	\$4.64	\$0.00	\$54.16	\$566.63
2011	5	5.00	8750	\$4.68	\$0.00	\$55.79	\$581.82
2012	5	5.00	8750	\$4.73	\$0.00	\$57.46	\$597.37
2013	5	5.00	8750	\$4.78	\$0.00	\$59.18	\$613.36
2014	5	5.00	8750	\$4.82	\$0.00	\$60.96	\$629.89
2015	5	5.00	8750	\$4.87	\$0.00	\$62.79	\$646.87
2016	5	5.00	8750	\$4.92	\$0.00	\$64.67	\$664.29

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$3,670.09	\$301.31	(\$3,368.78)	(\$3,368.78)
2008	\$77.28	\$309.30	\$232.02	\$220.97
2009	\$79.60	\$310.21	\$230.61	\$209.17
2010	\$81.99	\$566.63	\$484.64	\$418.65
2011	\$84.45	\$581.82	\$497.37	\$409.19
2012	\$86.98	\$597.37	\$510.39	\$399.90
2013	\$89.59	\$613.36	\$523.77	\$390.85
2014	\$92.28	\$629.89	\$537.61	\$382.07
2015	\$95.05	\$646.87	\$551.82	\$373.49
2016	\$97.90	\$664.29	\$566.39	\$365.10
Total	\$4,455.21	\$5,221.05	\$765.84	(\$199.39)

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4

**Appendix A
Impact of DSM Alternatives
Interruptible Rates**

DSM Technology Commercial	Summer Demand	Winter Demand	Annual Energy
Rated Load (kW per Unit)			
Coincident Factor (%)			
Contribution to Peak kW			
Demand Savings (%)			
Controllable Load (kW per unit)	75.00	75.00	
Annual Energy Usage			
Energy Savings (%)			
Energy Savings (kWh per unit)			1500
Estimated Commercial Customers	27	27	27
Estimated Appliance Saturation	100.00%	100.00%	100.00%
Market Eligibility	10.00%	10.00%	10.00%
Feasibility	100.00%	100.00%	100.00%
Estimated Controllable Units	3	3	3
Total Demand or Energy Savings (kW or kWh)	225	225	4,500

Estimated Installation Cost per Unit \$1,889.27
 Estimated Annual Maintenance Cost per Unit \$444.42
 Measure Life 25 Years
 Discount Rate 5.00%

Avoided Cost	Summer Capacity Savings (kW/unit)	Winter Capacity Savings (kW/unit)	Annual Energy Savings (kWh/unit)	Summer Capacity Charge (\$/kW-mon.)	Winter Capacity Charge (\$/kW-mon.)	Annual Energy Charge (\$/MWh)	Power Cost Savings (\$/unit)
2007	75	75.00	1500	\$4.50	\$0.00	\$45.00	\$1,417.50
2008	75	75.00	1500	\$4.55	\$0.00	\$46.35	\$1,433.03
2009	75	75.00	1500	\$4.59	\$0.00	\$47.74	\$1,448.75
2010	75	75.00	1500	\$4.64	\$0.00	\$49.17	\$1,464.67
2011	75	75.00	1500	\$4.68	\$0.00	\$50.65	\$1,480.79
2012	75	75.00	1500	\$4.73	\$0.00	\$52.17	\$1,497.11
2013	75	75.00	1500	\$4.78	\$0.00	\$53.73	\$1,513.65
2014	75	75.00	1500	\$4.82	\$0.00	\$55.34	\$1,530.40
2015	75	75.00	1500	\$4.87	\$0.00	\$57.00	\$1,547.36
2016	75	75.00	1500	\$4.92	\$0.00	\$58.71	\$1,564.55

Annual Cash Flows	Program Costs (\$/per Unit)	Power Cost Savings (\$/per Unit)	Annual Savings/ (Costs) (\$/per Unit)	Present Value (\$/per Unit)
2007	\$1,889.27	\$1,417.50	(\$471.77)	(\$471.77)
2008	\$444.42	\$1,433.03	\$988.61	\$941.53
2009	\$457.75	\$1,448.75	\$991.00	\$898.87
2010	\$471.48	\$1,464.67	\$993.19	\$857.95
2011	\$485.62	\$1,480.79	\$995.17	\$818.73
2012	\$500.19	\$1,497.11	\$996.92	\$781.11
2013	\$515.20	\$1,513.65	\$998.45	\$745.06
2014	\$530.66	\$1,530.40	\$999.74	\$710.50
2015	\$546.58	\$1,547.36	\$1,000.78	\$677.37
2016	<u>\$562.98</u>	<u>\$1,564.55</u>	<u>\$1,001.57</u>	<u>\$645.62</u>
Total	\$6,404.15	\$14,897.81	\$8,493.66	\$6,604.97

Footnote #1
 Footnote #2
 Footnote #3
 Footnote #4