# 2010 INTEGRATED RESOURCE PLAN

## FOR THE CLAY CENTER PUBLIC UTILITIES COMMISSION

FINAL REPORT – REVISED, MAY 6, 2011

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# ***Section I. Introduction***

This is the Integrated Resource Plan (IRP) for the Clay Center Public Utilities Commission (CCPUC). The IRP was developed by the Nebraska Municipal Power Pool (NMPP) under a contractual agreement to identify CCPUC's resource requirements for the 10-year period beginning fiscal year 2011 through fiscal year 2020.

## *Purpose*

CCPUC is responsible for serving the city of Clay Center with electricity and water services. 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 being completed to meet WAPA's requirements.

As part of CCPUC's obligation under EPAMP, this is the first IRP submitted to WAPA by CCPUC. The purpose of this IRP is to develop two and five-year implementation plans to serve CCPUC's power supply requirements at the lowest reasonable cost consistent with prudent financial and technical principles. Subsequent plans will be filed every five years.

## *Methodology*

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

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

- Screened DSM options to identify economical and technically feasible options to consider in the integration analysis,
- Integrated DSM options with supply resource options to develop an optimal IRP,
- Considered environmental impacts and costs of each option selected,
- Developed recommendation based on economic and non-economic considerations,
- Solicited public comments to a draft report and incorporated public comments in final IRP.

## *General Objectives*

CCPUC's goal is to provide reliable service at low rates. CCPUC also focuses on ensuring ample capacity for future growth and development. To achieve this stated goal, CCPUC focused on the following objectives in developing the IRP:

- Maintain local control of the utilities system.
- Provide reliable services for existing and new CCPUC customers.
- Provide cost based rates that are stable and recover adequate revenues.
- Maintain financial stability.

## *Utility Profile*

Clay Center is the county seat of Clay County. It is located at the junction of US-24 and K-15 in northeastern Kansas. CCPUC, a not-for-profit municipally owned electric utility, owns and operates the electric and water utilities. The City also owns and operates the wastewater utility and streets.

In 2010, the electric customers were segmented in the following customer classes:

- Residential 2,437
- Commercial 336
- Industrial 221

- Total Electric Customers: 2,994

CCPUC is a summer peaking utility with a system peak of 16,269 kW in August 2010. CCPUC's annual energy usage was 58,826 MWh in 2010, for an annual load factor of 41.3%.

Clay Center was a founding member of the Kansas Power Pool, which on May 1, 2005 became the first municipal power pool in the state of Kansas. KPP is a member driven organization which has increased its size and membership since its formation in 2005. KPP's vision and mission is to focus on providing the most effective and efficient wholesale electric service to its members (http://www.kansaspowerpool.org).

## ***Section II. Load Forecast***

### *Introduction*

Historical data was gathered from CCPUC and used in preparing the load forecast. Data was also gathered from KPP who indicates that Clay Center is partnering with KPP to build a 115 kV line for service to the City to support the potential addition of a TransCanada XL oil pipeline pumping station. The pumping station is projected to add 20-25 MW of load beginning in 2013. NMPP's research on similar pumping stations on the TransCanada Key Stone Pipeline operating in Nebraska shows that initial loading for the pumping stations is in the 3-5 MW range with monthly energy averaging about 500 MWh per month. This new load may over several years result in a significant increase in CCPUC's load, with the potential of increasing CCPUC's peak load to approximately 35 MW in the long-term.

Load projections were based on historical data through the year 2010. Using trending analysis, an annual base peak growth rate of 0.40% and an annual base energy growth rate of 1.36% is used for the period of 2011 through 2012. Beginning in 2013, the assumption used for the new pumping station load projections is an additional 3 MW peak demand increasing 0.5 MW per year through 2019, and then remaining constant in 2020. Energy taken by the pumping station is projected to total 6,000 MWh per year, increasing 127% per year thereafter. The Net System Peak and Net System Energy forecast with these assumptions are presented in Table 1.

**Table 1**
**Clay Center Public Utilities Commission**
**Historical and Projected**
**Peak Demand and Energy Requirements**

| Year | Net System Peak MW | Percent Change | Net System Energy MWh | Percent Change | Load Factor % |
|---|---|---|---|---|---|
| 1999 | 15.55 | | 40,332 | | 29.61% |
| 2000 | 19.95 | 28.30% | 44,393 | 10.07% | 25.33% |
| 2001 | 15.70 | -21.30% | 52,076 | 17.31% | 37.86% |
| 2002 | 14.81 | -5.67% | 53,645 | 3.01% | 41.35% |
| 2003 | 15.56 | 5.06% | 51,716 | -3.60% | 37.94% |
| 2004 | 14.05 | -9.70% | 51,168 | -1.06% | 41.46% |
| 2005 | 19.96 | 42.06% | 53,699 | 4.95% | 30.71% |
| 2006 | 16.00 | -19.84% | 53,521 | -0.33% | 38.19% |
| 2007 | 15.20 | -5.00% | 55,055 | 2.87% | 41.35% |
| 2008 | 14.60 | -3.97% | 56,743 | 3.07% | 44.26% |
| 2009 | 13.61 | -6.78% | 54,337 | -4.24% | 45.59% |
| 2010 | 16.27 | 19.57% | 58,826 | 8.26% | 41.28% |
| 2011 | 16.33 | 0.40% | 59,626 | 1.36% | 41.67% |
| 2012 | 16.40 | 0.40% | 60,437 | 1.36% | 41.96% |
| 2013 | 19.47 | 18.70% | 67,259 | 11.29% | 39.44% |
| 2014 | 20.03 | 2.90% | 69,697 | 3.62% | 39.72% |
| 2015 | 20.60 | 2.83% | 72,576 | 4.13% | 40.22% |
| 2016 | 21.16 | 2.75% | 76,010 | 4.73% | 40.89% |
| 2017 | 21.73 | 2.68% | 80,147 | 5.44% | 42.10% |
| 2018 | 22.30 | 2.61% | 85,169 | 6.27% | 43.60% |
| 2019 | 22.86 | 2.54% | 91,311 | 7.21% | 45.59% |
| 2020 | 22.93 | 0.29% | 98,871 | 8.28% | 49.09% |

*Footnotes:*
(1) Large customer load added in 2001.

| Average Annual Compound Growth Rates %: | | |
|---|---|---|
| 2001-2010 | 0.40% | 1.36% |
| 2011-2020 | 3.84% | 5.78% |

## ***Section III. Supply Side Resource Analysis***

### *Current Power Supply Arrangements*

The CCPUC system includes owned and purchased power supply resources, transmission system arrangements,

In 2012, CCPUC, in coordination with KPP, plans to construct eight and a half (8 ½) miles of new 115 kV transmission line to a new 115 to 34.5 KV substation. This new substation will be connected to the Clay Center power plant location with a new 34.5 kV sub-transmission line replacing the old 34.5 kV line service. The existing 34.5 KV line will be used for emergency back-up. These additions are estimated to result in minimal reductions to transmission losses and such amounts are not included in this analysis.

DSM programs for CCPUC customers are available through KPP and the Kansas Department of Energy. Some programs provide low interest loans and or grants to finance approved energy efficiency appliance purchases. One program consists of an energy audit which identifies energy efficiency improvements that will cost less than the financing of the improvement through the program. Improvements may be a variety of options including siding, windows, insulation, energy audits, and weatherization of buildings. See *http://www.efficiencykansas.com/*.

There are energy efficiency rebates for renewal energy generators, and performance contracting. The revolving loan fund program is perpetual in that the fund is replenished with the repayment of loans. The list below highlights some of the programs and initiatives noted on the Kansas Energy Office (a division of the Kansas Corporation Commission) website *http://www.kcc.state.ks.us/energy/index.htm*.

- Efficiency Kansas Loan Program
    - Energy Audit Rebates
    - Energy Auditor Training
    - Training Scholarships for Energy Auditors

  - Equipment for New Energy Auditors
  - Marketing
  - Loan Fee Rebates to Lenders
  - Take Charge Challenge
- Facility Conservation Improvement Program
- Comprehensive Utility Rate Design
- Renewable Energy Incentives Grants
- Energy Manager Grants
- Public Projects Grants
- Take Charge Challenge
- Energy Efficiency Building Codes Working Group

Exhibit A provides more detail on these programs.

## *Existing Supply Side Resources*

CCPUC system has the ability to generate 22.0 MW capacity and energy, purchases 1.6 MW of capacity and energy from WAPA, and purchases the balance or supplemental requirements from Kansas Power Pool. Table 2 summarizes CCPUC's existing supply side resources.

**Table 2**
**Clay Center Public Utilities Commission**
**Existing Generating Resources**

| Source | 2009 Capacity (MW) | 2009 Annual Energy (MWh) | % of Energy | 2010 Projected Capacity (MW) | 2010 Projected Annual Energy (MWh) | % of Energy |
|---|---|---|---|---|---|---|
| Generation [1] | 22.00 | 2,318 | 4.3% | 22.00 | 1,204 | 2.0% |
| WAPA [2] | 1.60 | 1,203 | 2.2% | 1.60 | 5,233 | 8.9% |
| Kansas Power Pool [3] | (3) | 50,816 | 93.5% | (3) | 52,389 | 89.1% |
| **Total** | **23.60** | **54,337** | **100%** | **23.60** | **58,826** | **100.0%** |

[1] 2010 capacity testing = 21.1 MW + .9 MW not reported.
[2] 2009 data represents October 2009 - December 2009 only. WAPA contract effective October 1, 2009.
[3] KPP provides supplemental requirements (all requirements above WAPA allocation) to City of Clay Center.

Owned Generation. CCPUC owns and operates engine generators. CCPUC indicated all units are operated as dual fuel.

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

Kansas Power Pool (KPP). KPP provides all supplemental requirements to CCPUC. Thus, all load growth is provided by and planned for CCPUC by KPP. The contract expires in May 2020 with a two year notice to terminate provision.

Transmission. Clay Center is interconnected at 115 kV with Westar. KPP provides transmission service for WAPA and KPP purchases under Southwest Power Pool (SPP) network integration transmission service (NITS). KPP serves as the scheduling agent for the SPP transmission service. CCPUC's obligation under the KPP Operating Agreement expires in May 2020 with a two year notice to terminate provision.

## *Comparison of Loads and Resources*

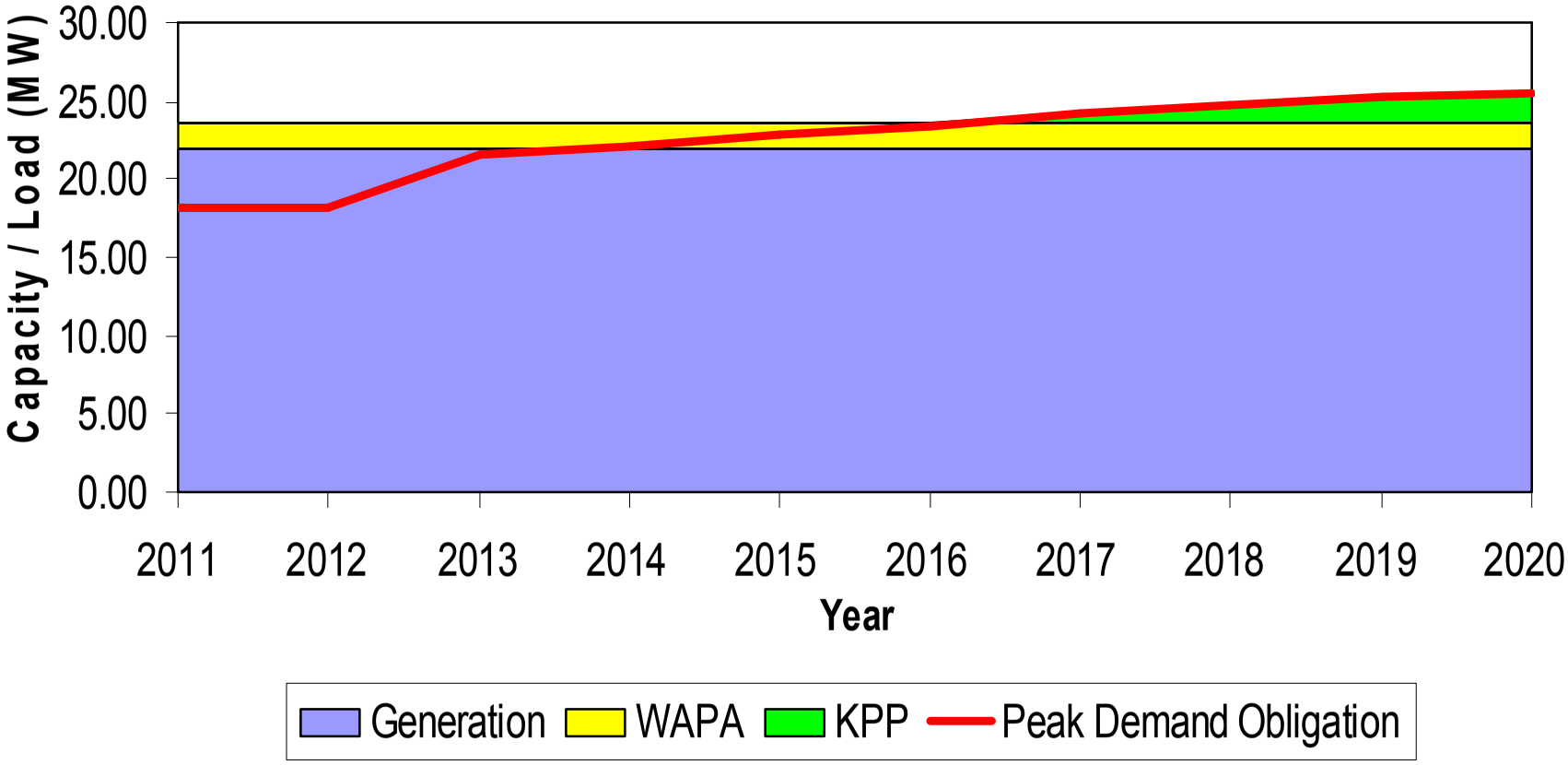
Forecasted peak demand and energy requirements were summarized and compared to existing capacity and energy resources. Table 3 (page 9) summarizes the Comparison of Peak Demand and Energy Requirements to Resources. Figure 1 (page 10) is the graphical presentation of the comparison of loads and resources.

**Table 3**
**Clay Center Public Utilities Commission**
**Comparison of Peak Demand and**
**Enegy Requirements to Resources**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Demand | | | | | | | | | | |
| Peak Demand Obligation (1) (2) | 18.1 | 18.2 | 21.6 | 22.2 | 22.9 | 23.5 | 24.1 | 24.8 | 25.4 | 25.5 |
| Capacity Resources (3) | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 |
| Surplus/(Deficit) | 5.5 | 5.4 | 2.0 | 1.4 | 0.7 | 0.1 | (0.5) | (1.2) | (1.8) | (1.9) |

Notes:
(1) Included forecast demand and 12% required reserves.
(2) Peak Demand is the summer peak, as Clay Center is a summer peaker.

**Figure 1**
**Comparison of Peak Demand to Resources**



CCPUC's Peak Demand Obligation includes peak demand and capacity reserves. Capacity reserves were calculated using the SPP reserve requirement of 12% of peak demand.

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

- CCPUC has sufficient capacity resources throughout the study period.
- CCPUC has sufficient energy resources throughout the study period.

The owned resources are used to supply energy minimally because the cost of production is typically greater than the energy purchased from KPP.

## *Future Supply Side Resources*

CCPUC is included in a statewide joint planning process through membership in KPP. KPP then jointly coordinates long-term power supply plans with other Power Agencies to meet the electric power needs of all power supply agencies in the state of Kansas.

## *Identification of Resource Options*

The following is a description of the supply options reviewed in this study.

Renewable Resources. CCPUC, through its membership in KPP, is involved in renewable resources. KPP includes renewable resources in its resource portfolio, including hydro (Bowersock dam near Lawrence, KS and through participation in Grand River Dam Authority).

Energy Purchases. Purchases of other utilities power and energy from the open market is an option that KPP can also use when it is in the best economic and reliability interest of CCPUC and other KPP members

## *Evaluation Criteria*

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

- Availability to meet CCPUC's resource timing needs,
- Reliability and dispatchability of the resources,
- Cost of transmission to deliver the resource,
- Operational flexibility and marketability of the resource,
- Environmental impacts and compliance costs of the resource, and
- Total delivered cost of the resource.

## *Supply Side Resources Selected for Screening*

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

The supply-side resource alternatives are listed as follows:

- Continue to provide supplemental requirements via purchases from KPP or other market suppliers.
- Encourage customer owned renewable capacity and energy to offset peaking energy purchases and production.

## ***Section IV. Demand Side Analysis***

### *Review of Load Shape Objectives*

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

Strategic Load Growth

Strategic Load Growth involves promoting increase in loads of any kind. This is typically for utilities with surplus low cost baseload generation.

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 for selected time periods. Strategic conservation has a levelized effect on end-use consumption, and may have a lesser reduction to peak load. An example of strategic conservation is promoting purchases of efficient appliances.

Valley Filling

Valley filling is a program that promotes increasing off-peak loads. Promotion of night lighting is an example of a program that may build evening loads, and promotion of electric heat pumps is a program that builds off-season loads.

Load Shifting

Load shifting moves 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 with daily calls to reduce loads when necessary. Interruptible load programs and time-of-day rates are an example of flexible load shape.

## *DSM Program Evaluations*

Demand Side Management (DSM) options are evaluated as a means of deferring capacity acquisitions. DSM options modify the end use load shape. Fourteen types of DSM programs were evaluated using screening analysis and economic feasibility.

1. Residential Central Air Conditioning Load Cycling

This DSM program requires the installation of a load-control device that will turn off the air conditioner for a short time (5-15 minutes) during summer peak-load periods. The customer incentive to participate is estimated to be $20 per year with an average load reduction of .85 kW per control device on residential homes.

2. Residential Electric Water Heater Load Shedding

A customer incentive of $10 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.

3. Residential High Efficiency Central Air Conditioners

For customers replacing an existing air conditioner, this program provides cash rebates. CCPUC must agree to the size of the 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. Rebates or incentives may be provided from distributors or manufactures.

4. Room and Window Air Conditioner Rebates

This program is for customers replacing existing room or window air conditioner. Rebates of $55 are provided for units with a SEER of 10 or more.

5. High Efficiency Refrigerator/Freezer Rebate Program

Customers purchasing an Energy Star© Rated refrigerator/freezer would be eligible for a $50 rebate. The old refrigerator must be properly disposed by the dealer for proper recycling of refrigerator/freezer components.

6. Old Refrigerator Pick-up Program

This purpose of this program is to remove operating refrigerators from homes and the used appliance market. The program educates residential customers about the costs of operating a second refrigerator and offers a $35 payment for qualifying operating refrigerator or freezer. A regional contractor picks up the units and delivers them to a de-manufacturing facility. The total cost is about $175/ unit and the utility program may be eligible for a grant from the Kansas Department of Environmental Quality.

7. Loan Program for AC Replacement

This program provides a loan subsidy to customers installing properly sized high-efficiency equipment. CCPUC could make a payment directly to a participating bank granting the loan, or CCPU could direct customers to the Kansas Energy Office's low interest loan program to finance energy efficiency measures a homeowner or business owner are considering. This is a revolving loan fund and may include a performance contracting element to assure that the systems are built to specification, and expected energy use parameters are met.

8. Energy Star© Home Construction

Customers receive incentives in the form of a rebate, rate discount or a loan subsidy from CCPUC or State Department of Energy for building a new home that meets Energy Star© Home Construction efficiency standards. This program requires high efficiency and not oversized central air conditioners and furnaces. This program also includes points for additional insulation, reduction of infiltration measures like 'wraps', efficient windows, efficient lighting and reduction of heat gain or loss.

9. Existing low-income Home Weatherization

Energy efficient improvements for existing homes including additional insulation, day-lighting, reduction of infiltration, and full basement insulation are eligible for customer grants through the Kansas Energy Office.

10. Commercial High-Efficiency Lighting Conversions

This program provides incentives, rebates or loans for commercial and industrial customers who increase the efficiency of their existing lighting systems. Permanent fixtures are replaced with approved high efficient fixtures. Examples include converting from T-12 to T-8 lights with electronic ballasts, high bay metal halide conversions to T-8 or T-5 or induction florescent fixtures, and adding day-light harvesting controls.

11. Commercial High-Efficiency Air Conditioners

Commercial customers would receive incentives for replacing existing air conditioners with high-efficiency air conditioners. Examples of qualifying equipment are packaged terminal units, rooftop units, and split systems.

12. 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 by adding cooling towers capacity, variable speed drives or motors, and energy management controls to reduce peak hour loading.

13. Large Customer Customized Rebate Program

This program would provide 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 non-HVAC energy-efficient motors, variable speed motor controls and energy management systems providing long-term and fixed energy savings.

14. Interruptible Load Purchase Program

Large Industrial customers receive payments for interrupting all or part of their load during peak periods when asked by CCPUC/KPP. The customer signs a contact before the peak season starts, and is obligated to interrupt a certain amount of their load for a limited number of times during a year for periods of eight hours or less.

Based on CCPUC'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, ranks the potential DSM options according to subjective criteria, such as customer preference, market potential, and ease of implementation. A score was assigned to each DSM option and the options are ranked. This narrows the list of options for the second step, Economic Evaluation.

The Economic Evaluation uses the CCPUC avoided costs for capacity and energy calculated in the supply side resource evaluation. This is used to calculate the costs and benefits of each DSM option.

Much of the DSM screening utilized process for evaluating and data references from the WAPA Resource Planning Guide (RPG).

## *Qualitative Screening*

The DSM technologies which satisfy CCPUC'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 CCPUC'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 participate.
- Environmental Impacts: DSM technologies can postpone the need to add supply-side resources that emit pollutants, but some DSM options also have environmental impacts. For example, hazardous waste disposal may be an issue with improper disposal of old refrigerator compressors containing CFCs and old ballasts with PCBs.

- Market Potential: In order for the program to realize its maximum potential, end-use appliances and equipment must be identified, measured and marketed.
- Ease of Implementation: A program's success will be heavily dependent on the success of implementation. Some programs may require the simple replacement of lights or appliances, while others require major planning for changes in the building infrastructure.
- Availability: The DSM technology and contractors must be widely 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 likely to be successful in achieving CCPUC's load shape objectives. Tables 4 and 5 (page 18) show the scores for each technology applicable to a particular customer class.

All applicable technologies were ranked from high to low for each customer class. CCPUC then selected the above fourteen technologies for economic evaluation. The options that passed the qualitative screening included nine residential options, and five commercial/industrial options. This pre-screening only used qualitative factors to narrow the list of for an economic evaluation.

**Table 4**
**Clay Center Public Utilities Commission**
**Qualitative Screening**
**Residential Demand Side Measures**

| Technology Alternative | Cost | Customer Preference | Environmental Impact | Market Potential | Ease of Implementation | Commercial Availability/ Reliability | Total |
|---|---|---|---|---|---|---|---|
| Residential Central Air Conditioning Load Cycling | 2 | 2 | 2 | 3 | 2 | 3 | 14 |
| Residential Electric Water Heater Load Shedding | 2 | 3 | 3 | 1 | 3 | 3 | 15 |
| Residential 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 |
| Loan Program for AC Replacement | 2 | 3 | 3 | 3 | 3 | 3 | 17 |
| Energy Star© Home Construction | 1 | 2 | 3 | 2 | 2 | 2 | 12 |
| Existing Home Weatherization | 1 | 2 | 3 | 2 | 2 | 2 | 12 |

**Table 5**
**Clay Center Public Utilities Commission**
**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 Load Program | 3 | 3 | 3 | 1 | 1 | 3 | 14 |

## *Economic Evaluation*

The projected annual cost for each option was compared to the projected power cost savings. The net present value (NPV) of the cost or savings of each option is then determined.

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 option.
- Technical information for the options 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 are taken from the Supply Side Resource Evaluation analysis. Peak demand reductions are assumed to reduce seasonal capacity purchases. The summer season is June-September, and the winter season is October-May.
- A NPV discount rate of 5.0% is assumed.
- The Total Resource Cost (TRC) test is defined as the comparison of the option including costs incurred by CCPUC or the end user, to the total cost savings realized by CCPUC.

The fourteen DSM options were evaluated over a ten-year study period. The evaluation includes estimates of installation, operation, maintenance, administrative and general expenses over the ten-year period. The expenses are compared to CCPUC's avoided capacity and energy cost. Annual net cost or savings are calculated and discounted to 2010 Dollars. DSM options with a positive net present value were considered economically viable.

A summary of the economic evaluations is shown in Table 6. The analysis of each individual DSM option is shown in Appendix A.

**Table 6**
**Clay Center Public Utilities Commission**
**Summary of DSM Measures**
**Projected Costs and Savings**
**(2010 $)**

| DSM Measure | Present Value of Annual Savings (Costs) per unit (1) |
|---|---|
| Residential | |
| Residential Central Air Conditioning Load Cycling | ($61.69) |
| Residential Electric Water Heater Load Shedding | ($155.34) |
| Residential High Efficiency Central Air Conditioners | ($101.54) |
| Room and Window Air Conditioner Rebates | ($104.50) |
| High Efficiency Refrigerator Rebate Program | ($267.32) |
| Old Refrigerator Pick-up Program | ($199.17) |
| Loan Program for AC Replacement | ($558.08) |
| Energy Star© Home Construction | ($2,290.96) |
| Existing Home Weatherization | ($817.69) |
| Commercial/Industrial | |
| Commercial High-Efficiency Lighting | ($1,640.37) |
| Commercial High-Efficiency Air Conditioners | ($734.57) |
| Commercial HVAC Efficiency Improvement Program | ($78.67) |
| Large Customer Customized Rebate Program | ($5,668.04) |
| Interruptible Load Program | $1,595.43 |

(1) Discount rate of 5.0% was used.

Primarily due to the fact that CCPUC's power supply costs are competitive, it appears the only DSM option that is economically feasible is:

- Interruptible Rates

CCPUC should also consider low-cost DSM options, such as promoting energy efficiency (heat pumps and lighting conversion programs) via the CCPUC website and customer flyers.

## ***Section V: Supply/Demand Side Resource Integration***

### *Development of Integrated Resource Plan*

Least cost supply resources were combined to develop two cases. These cases and associated costs were developed by NMPP using information contained in the Burns &McDonnell Joint Resource Planning Study prepared for Kansas Municipal Utilities on August 11, 2010. Each case includes the projected baseload growth rate for energy, which averages 1.36% per year without the pipeline pumping station load, and 5.78% with the pumping station load.

- **Base Case**

The Base Case includes existing resources and supplemental energy purchases through 2020. An economic analysis in not necessary to compare to Case 1 because the value of customer owned renewable generation, of the type allowed by Federal Regulations promulgated by the Public Utilities Regulatory Policies Act of 1978 (PURPA) and as amended by Congress since 1978, has an essentially a net zero value because CCPUC it is required to pay its avoided cost to the customer owner for the kWh plus losses delivered to the distribution system. This type of generation however has environmental value in that it potentially replaces energy that would otherwise be provided by fossil fuel resources thus each renewable kWh from wind or solar reduces the amount of $CO_2$, SOx and NOx gases emitted. The customer may also receive potential value from Renewable Energy Credits (REC) and some future form of Green House Gas or Carbon Tax credits for energy produced. These environmental cost and benefits are not estimated in this study.

- **Case 1**

Case 1 includes existing resources plus promotion of customer owned renewable generation. The customer owned renewable generation should be capped at about 2% of CCPUC's then-

current total energy requirements. This 2% cap is an approximate level where operational and dispatchability related issues and potential transmission system constraints may become significant. PURPA provides that any utility must purchase the output of Qualifying Facilities at its avoided cost or offer to deliver the power to another utility at its standard transmission rate. See http://www.oe.energy.gov/purpa.htm for more details.

## *Preferred Alternative*

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

- Extend the KPP contract at least through 2030 and consider even longer, depending on terms and conditions.
- Based on load growth, CCPUC will need additional resources from KPP.

## *Environmental Impact*

- CCPUC holds a Class I operating permit through the Kansas Department of Health and Environment, and complies with applicable provisions of the Clean Air Act and Clean Water Act at its power plant and substation facilities.
- New Environmental Protection Agency (EPA) rules on compliance with Reciprocating Internal Combustion Engines (RICE) beginning in May 2013 will apply to CCPUC generation facilities. KPP has a plan in place to bring its member's generation into compliance with these rules.
- 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***

The following action plans are recommended:

**Two Year Action Plan**

Based on the assumptions used, and analyses completed, the following Two Year Action Plan is recommended.

- Partner with the KPP and the state of Kansas for viable programs such as energy audits and low-income housing weatherization. CCPUC should promote partnerships with the KPP via a link on its website.
- Implement DSM programs such as energy efficiency lighting and heat pump promotion via the CCPUC website and contractor education.
- Establish a seasonal residential rate with a heating end-block pricing at avoided cost plus appropriate margin to encourage heat-pump sales.
- Consider purchases of renewable energy resources to meet state law requirement or at a level determined by customer commitment to paying the incremental cost.

CCPUC should review and modify this action plan if significant costs for supply resources, DSM and transmission change.

**Five Year Action Plan**

Based on the assumptions used, and analyses completed, the following Five Year Action Plan is recommended.

- The KPP contract runs through May 2020 with a two year termination notice. CCPUC should evaluate power supply options in 2017 to determine if continuing with KPP is warranted.
- Continuation of Two Year Action Plan.
- Review other options as they become available.

CCPUC should review and modify this action plan if significant costs for supply resources, DSM and transmission change.

## *Public Participation*

Part of the IRP implementation process involves public participation. CCPUC has involved the public in developing the IRP, and will continue to solicit public participation via annual surveys and focus groups as it implements the IRP.

The Integrated Resource Plan was presented at a public hearing of the CCPUC at noon on February 14, 2011. The purpose of this hearing was to provide information to and gather input from groups and individuals with an interest in CCPUC's Integrated Resource Plan. A Notice of the public hearing appeared in the city of Clay Center's local newspaper, the Clay Center Dispatch beginning on January 7, 2011, and was posted at the CCPUC office. The Public Notice stated that copies of the presentation and handouts would be available at the hearing. Attendees at the public hearing included:

1. Bill Callaway, Superintendent - CCPUC
2. Liana Hess, Office Manager - CCPUC
3. Donald J. Button, Commissioner - CCPUC
4. Justin M. Begnoche, Commissioner - CCPUC, Councilmember – Clay Center City Council
5. Michael Floersch, [Chairman} - Commissioner - CCPUC
6. Jim Thatcher, general public
7. Dafon Hess, Councilmember – Clay Center City Council
8. Jill Jones, Market/Settlements Analyst – NMPP Energy, IRP Lead Analyst
9. Phil Euler, Manager of Planning & Engineering – NMPP Energy, Presenter of IRP results

Phil Euler presented a PowerPoint presentation using a hard copy printout. Printed copies of the presentation were provided to all attendees of the public hearing, and extra copies were left at the CCPUC

offices. Items of discussion involved power supply options and issues. There were no concerns raised by any of the attendees. The IRP was approved by the CCPUC on February 28, 2011. The Minutes of Meeting of Clay Center Public Utilities Meeting February 28, 2011 are presented in Exhibit – B.

## *Validation of Predicted Performance*

Using the 2010 IRP Final Report as a baseline, CCPUC compares its load forecasts to actual usage on an annual and monthly basis and estimates growth trends and records significant load changing events and effectiveness of DSM. This comparison will be continually updated in the future. In addition, CCPUC will continue to verify the effectiveness of demand-side options in its annual progress reports to this IRP.

## *Annual Progress Reports*

Annual reports will provide comparisons of actual and predicted:

- Power supply costs,
- Demand-side management activity,
- Planned changes in power supply resources or demand-side management programs.

The annual reports will provide status updates the IRP. Changes to the IRP may be necessary as load and costs of purchased power or demand-side options change.

# Appendix A

**Appendix A**
**Impact of DSM Options**
**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 | 2,427 | 2,427 | 2,427 |
| 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** | 573 | 573 | 573 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **487** | **0** | **5,730** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $237.26 | |
| Estimated Annual Maintenance Cost per Unit | $11.04 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.85 | 0.00 | 10 | $9.50 | $0.00 | -$38.33 | $31.92 |
| 2012 | 0.83 | 0.00 | 10 | $9.79 | $0.00 | -$38.33 | $32.10 |
| 2013 | 0.81 | 0.00 | 10 | $10.08 | $0.00 | -$38.33 | $32.27 |
| 2014 | 0.79 | 0.00 | 10 | $10.38 | $0.00 | -$38.33 | $32.42 |
| 2015 | 0.77 | 0.00 | 10 | $10.69 | $0.00 | -$38.33 | $32.55 |
| 2016 | 0.75 | 0.00 | 10 | $11.01 | $0.00 | -$38.33 | $32.66 |
| 2017 | 0.73 | 0.00 | 10 | $11.34 | $0.00 | -$38.33 | $32.74 |
| 2018 | 0.71 | 0.00 | 10 | $11.68 | $0.00 | -$38.33 | $32.80 |
| 2019 | 0.69 | 0.00 | 10 | $12.03 | $0.00 | -$38.33 | $32.83 |
| 2020 | 0.67 | 0.00 | 10 | $12.40 | $0.00 | -$38.33 | $32.84 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $237.26 | $31.92 | ($205.34) | ($205.34) |
| | 2012 | $11.04 | $32.10 | $21.06 | $20.06 |
| | 2013 | $11.37 | $32.27 | $20.90 | $18.96 |
| | 2014 | $11.71 | $32.42 | $20.71 | $17.89 |
| | 2015 | $12.06 | $32.55 | $20.49 | $16.86 |
| | 2016 | $12.42 | $32.66 | $20.24 | $15.86 |
| | 2017 | $12.79 | $32.74 | $19.95 | $14.89 |
| | 2018 | $13.17 | $32.80 | $19.63 | $13.95 |
| | 2019 | $13.57 | $32.83 | $19.26 | $13.04 |
| | 2020 | $13.98 | $32.84 | $18.86 | $12.16 |
| Total | | $349.37 | $325.13 | ($24.24) | ($61.69) |

**Appendix A**
**Impact of DSM Options**
**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 | 2,427 | 2,427 | 2,427 |
| 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** | 182 | 182 | 182 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **82** | **0** | **910** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $184.73 | |
| Estimated Annual Maintenance Cost per Unit | $13.49 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.45 | 0.00 | 5 | $9.50 | $0.00 | -$38.33 | $16.91 |
| 2012 | 0.44 | 0.00 | 5 | $9.79 | $0.00 | -$38.33 | $16.89 |
| 2013 | 0.42 | 0.00 | 5 | $10.08 | $0.00 | -$38.33 | $16.88 |
| 2014 | 0.41 | 0.00 | 5 | $10.38 | $0.00 | -$38.33 | $16.86 |
| 2015 | 0.40 | 0.00 | 5 | $10.69 | $0.00 | -$38.33 | $16.85 |
| 2016 | 0.39 | 0.00 | 5 | $11.01 | $0.00 | -$38.33 | $16.83 |
| 2017 | 0.37 | 0.00 | 5 | $11.34 | $0.00 | -$38.33 | $16.82 |
| 2018 | 0.36 | 0.00 | 5 | $11.68 | $0.00 | -$38.33 | $16.80 |
| 2019 | 0.35 | 0.00 | 5 | $12.03 | $0.00 | -$38.33 | $16.79 |
| 2020 | 0.34 | 0.00 | 5 | $12.40 | $0.00 | -$38.33 | $16.77 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $184.73 | $16.91 | ($167.82) | ($167.82) |
| | 2012 | $13.49 | $16.89 | $3.40 | $3.24 |
| | 2013 | $13.89 | $16.88 | $2.99 | $2.71 |
| | 2014 | $14.31 | $16.86 | $2.55 | $2.20 |
| | 2015 | $14.74 | $16.85 | $2.11 | $1.74 |
| | 2016 | $15.18 | $16.83 | $1.65 | $1.29 |
| | 2017 | $15.64 | $16.82 | $1.18 | $0.88 |
| | 2018 | $16.11 | $16.80 | $0.69 | $0.49 |
| | 2019 | $16.59 | $16.79 | $0.20 | $0.14 |
| | 2020 | $17.09 | $16.77 | ($0.32) | ($0.21) |
| Total | | $321.77 | $168.40 | ($153.37) | ($155.34) |

**Appendix A**
**Impact of DSM Options**
**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 | 2,427 | 2,427 | 2,427 |
| 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** | 716 | 716 | 716 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **644** | **0** | **358,000** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $250.48 | |
| Estimated Annual Maintenance Cost per Unit | $2.79 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.9 | 0.00 | 500 | $9.50 | $0.00 | -$38.33 | $15.04 |
| 2012 | 0.9 | 0.00 | 500 | $9.79 | $0.00 | -$38.33 | $16.06 |
| 2013 | 0.9 | 0.00 | 500 | $10.08 | $0.00 | -$38.33 | $17.12 |
| 2014 | 0.9 | 0.00 | 500 | $10.38 | $0.00 | -$38.33 | $18.21 |
| 2015 | 0.9 | 0.00 | 500 | $10.69 | $0.00 | -$38.33 | $19.33 |
| 2016 | 0.9 | 0.00 | 500 | $11.01 | $0.00 | -$38.33 | $20.48 |
| 2017 | 0.9 | 0.00 | 500 | $11.34 | $0.00 | -$38.33 | $21.67 |
| 2018 | 0.9 | 0.00 | 500 | $11.68 | $0.00 | -$38.33 | $22.90 |
| 2019 | 0.9 | 0.00 | 500 | $12.03 | $0.00 | -$38.33 | $24.16 |
| 2020 | 0.9 | 0.00 | 500 | $12.40 | $0.00 | -$38.33 | $44.62 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $250.48 | $15.04 | ($235.44) | ($235.44) |
| | 2012 | $2.79 | $16.06 | $13.27 | $12.64 |
| | 2013 | $2.87 | $17.12 | $14.25 | $12.93 |
| | 2014 | $2.96 | $18.21 | $15.25 | $13.17 |
| | 2015 | $3.05 | $19.33 | $16.28 | $13.39 |
| | 2016 | $3.14 | $20.48 | $17.34 | $13.59 |
| | 2017 | $3.23 | $21.67 | $18.44 | $13.76 |
| | 2018 | $3.33 | $22.90 | $19.57 | $13.91 |
| | 2019 | $3.43 | $24.16 | $20.73 | $14.03 |
| | 2020 | $3.53 | $44.62 | $41.09 | $26.49 |
| Total | | $278.81 | $219.59 | -$59.22 | ($101.54) |

**Appendix A**
**Impact of DSM Options**
**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 | 2,427 | 2,427 | 2,427 |
| 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** | 120 | 120 | 120 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **17** | **0** | **12,360** |

| | |
|---|---|
| Estimated Installation Cost per Unit | $81.67 |
| Estimated Annual Maintenance Cost per Unit | $4.17 |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.138 | 0.00 | 103 | $9.50 | $0.00 | -$38.33 | $1.30 |
| 2012 | 0.134 | 0.00 | 103 | $9.79 | $0.00 | -$38.33 | $1.29 |
| 2013 | 0.130 | 0.00 | 103 | $10.08 | $0.00 | -$38.33 | $1.29 |
| 2014 | 0.126 | 0.00 | 103 | $10.38 | $0.00 | -$38.33 | $1.28 |
| 2015 | 0.122 | 0.00 | 103 | $10.69 | $0.00 | -$38.33 | $1.28 |
| 2016 | 0.119 | 0.00 | 103 | $11.01 | $0.00 | -$38.33 | $1.27 |
| 2017 | 0.115 | 0.00 | 103 | $11.34 | $0.00 | -$38.33 | $1.27 |
| 2018 | 0.112 | 0.00 | 103 | $11.68 | $0.00 | -$38.33 | $1.26 |
| 2019 | 0.108 | 0.00 | 103 | $12.03 | $0.00 | -$38.33 | $1.26 |
| 2020 | 0.105 | 0.00 | 103 | $12.40 | $0.00 | -$38.33 | $1.25 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $81.67 | $1.30 | ($80.37) | ($80.37) |
| | 2012 | $4.17 | $1.29 | ($2.88) | ($2.74) |
| | 2013 | $4.30 | $1.29 | ($3.01) | ($2.73) |
| | 2014 | $4.43 | $1.28 | ($3.15) | ($2.72) |
| | 2015 | $4.56 | $1.28 | ($3.28) | ($2.70) |
| | 2016 | $4.70 | $1.27 | ($3.43) | ($2.69) |
| | 2017 | $4.84 | $1.27 | ($3.57) | ($2.66) |
| | 2018 | $4.99 | $1.26 | ($3.73) | ($2.65) |
| | 2019 | $5.14 | $1.26 | ($3.88) | ($2.63) |
| | 2020 | $5.29 | $1.25 | ($4.04) | ($2.60) |
| Total | | $124.09 | $12.75 | ($111.34) | ($104.50) |

**Appendix A**
**Impact of DSM Options**
**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 | 2,427 | 2,427 | 2,427 |
| 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** | 364 | 364 | 364 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **30** | **30** | **188,916** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $149.29 | |
| Estimated Annual Maintenance Cost per Unit | $5.36 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.082 | 0.08 | 519 | $9.50 | $9.50 | -$38.33 | -$10.54 |
| 2012 | 0.082 | 0.08 | 519 | $9.79 | $9.79 | -$38.33 | -$10.26 |
| 2013 | 0.082 | 0.08 | 519 | $10.08 | $10.08 | -$38.33 | -$9.97 |
| 2014 | 0.082 | 0.08 | 519 | $10.38 | $10.38 | -$38.33 | -$9.68 |
| 2015 | 0.082 | 0.08 | 519 | $10.69 | $10.69 | -$38.33 | -$9.37 |
| 2016 | 0.082 | 0.08 | 519 | $11.01 | $11.01 | -$38.33 | -$9.05 |
| 2017 | 0.082 | 0.08 | 519 | $11.34 | $11.34 | -$38.33 | -$8.73 |
| 2018 | 0.082 | 0.08 | 519 | $11.68 | $11.68 | -$38.33 | -$8.39 |
| 2019 | 0.082 | 0.08 | 519 | $12.03 | $12.03 | -$38.33 | -$8.05 |
| 2020 | 0.082 | 0.08 | 519 | $12.40 | $12.40 | -$38.33 | -$7.69 |

| Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|
| 2011 | $149.29 | -$10.54 | ($159.83) | ($159.83) |
| 2012 | $5.36 | -$10.26 | ($15.62) | ($14.88) |
| 2013 | $5.52 | -$9.97 | ($15.49) | ($14.05) |
| 2014 | $5.69 | -$9.68 | ($15.37) | ($13.28) |
| 2015 | $5.86 | -$9.37 | ($15.23) | ($12.53) |
| 2016 | $6.04 | -$9.05 | ($15.09) | ($11.82) |
| 2017 | $6.22 | -$8.73 | ($14.95) | ($11.16) |
| 2018 | $6.41 | -$8.39 | ($14.80) | ($10.52) |
| 2019 | $6.60 | -$8.05 | ($14.65) | ($9.92) |
| 2020 | $6.80 | -$7.69 | ($14.49) | ($9.34) |
| Total | $203.79 | -$91.73 | ($295.52) | ($267.32) |

**Appendix A**
**Impact of DSM Options**
**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)** | **0.100** | **0.100** | |
| | | | |
| Annual Energy Usage | | | |
| Energy Savings (%) | | | |
| **Energy Savings (kWh per unit)** | | | **410** |
| | | | |
| Estimated Residential Customers | 2,427 | 2,427 | 2,427 |
| 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** | 364 | 364 | 364 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **36** | **36** | **149,240** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $143.74 | |
| Estimated Annual Maintenance Cost per Unit | $4.12 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 0.1 | 0.10 | 410 | $9.50 | $9.50 | -$38.33 | -$4.31 |
| 2012 | 0.1 | 0.10 | 410 | $9.79 | $9.79 | -$38.33 | -$3.97 |
| 2013 | 0.1 | 0.10 | 410 | $10.08 | $10.08 | -$38.33 | -$3.62 |
| 2014 | 0.1 | 0.10 | 410 | $10.38 | $10.38 | -$38.33 | -$3.26 |
| 2015 | 0.1 | 0.10 | 410 | $10.69 | $10.69 | -$38.33 | -$2.88 |
| 2016 | 0.1 | 0.10 | 410 | $11.01 | $11.01 | -$38.33 | -$2.50 |
| 2017 | 0.1 | 0.10 | 410 | $11.34 | $11.34 | -$38.33 | -$2.10 |
| 2018 | 0.1 | 0.10 | 410 | $11.68 | $11.68 | -$38.33 | -$1.69 |
| 2019 | 0.1 | 0.10 | 410 | $12.03 | $12.03 | -$38.33 | -$1.27 |
| 2020 | 0.1 | 0.10 | 410 | $12.40 | $12.40 | -$38.33 | -$0.84 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $143.74 | -$4.31 | ($148.05) | ($148.05) |
| | 2012 | $4.12 | -$3.97 | ($8.09) | ($7.70) |
| | 2013 | $4.24 | -$3.62 | ($7.86) | ($7.13) |
| | 2014 | $4.37 | -$3.26 | ($7.63) | ($6.59) |
| | 2015 | $4.50 | -$2.88 | ($7.38) | ($6.07) |
| | 2016 | $4.64 | -$2.50 | ($7.14) | ($5.59) |
| | 2017 | $4.78 | -$2.10 | ($6.88) | ($5.13) |
| | 2018 | $4.92 | -$1.69 | ($6.61) | ($4.70) |
| | 2019 | $5.07 | -$1.27 | ($6.34) | ($4.29) |
| | 2020 | $5.22 | -$0.84 | ($6.06) | ($3.91) |
| Total | | $185.60 | -$26.44 | ($212.04) | ($199.17) |

**Appendix A**
**Impact of DSM Options**
**Loan Program for 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 | 2,427 | 2,427 | 2,427 |
| 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** | 141 | 141 | 141 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **141** | **141** | **70,500** |

| | |
|---|---|
| Estimated Installation Cost per Unit | $639.01 |
| Estimated Annual Maintenance Cost per Unit | $14.18 |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 1 | 1.00 | 500 | $9.50 | $0.00 | -$38.33 | $18.84 |
| 2012 | 1 | 1.00 | 500 | $9.79 | $0.00 | -$38.33 | $19.98 |
| 2013 | 1 | 1.00 | 500 | $10.08 | $0.00 | -$38.33 | $21.15 |
| 2014 | 1 | 1.00 | 500 | $10.38 | $0.00 | -$38.33 | $22.36 |
| 2015 | 1 | 1.00 | 500 | $10.69 | $0.00 | -$38.33 | $23.61 |
| 2016 | 1 | 1.00 | 500 | $11.01 | $0.00 | -$38.33 | $24.89 |
| 2017 | 1 | 1.00 | 500 | $11.34 | $0.00 | -$38.33 | $26.21 |
| 2018 | 1 | 1.00 | 500 | $11.68 | $0.00 | -$38.33 | $27.57 |
| 2019 | 1 | 1.00 | 500 | $12.03 | $0.00 | -$38.33 | $28.97 |
| 2020 | 1 | 1.00 | 500 | $12.40 | $0.00 | -$38.33 | $30.42 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $639.01 | $18.84 | ($620.17) | ($620.17) |
| | 2012 | $14.18 | $19.98 | $5.80 | $5.52 |
| | 2013 | $14.61 | $21.15 | $6.54 | $5.93 |
| | 2014 | $15.05 | $22.36 | $7.31 | $6.31 |
| | 2015 | $15.50 | $23.61 | $8.11 | $6.67 |
| | 2016 | $15.97 | $24.89 | $8.92 | $6.99 |
| | 2017 | $16.45 | $26.21 | $9.76 | $7.28 |
| | 2018 | $16.94 | $27.57 | $10.63 | $7.55 |
| | 2019 | $17.45 | $28.97 | $11.52 | $7.80 |
| | 2020 | $17.97 | $30.42 | $12.45 | $8.03 |
| Total | | $783.13 | $244.00 | ($539.13) | ($558.08) |

**Appendix A**
**Impact of DSM Options**
**Energy Star© Home Construction**

| 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)** | | | **8760** |
| Estimated Residential Customers | 2,427 | 2,427 | 2,427 |
| 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** | 73 | 73 | 73 |
| **Total Demand or Energy Savings (kW or kWh)** | **73** | **73** | **639,480** |

| | |
|---|---|
| Estimated Installation Cost per Unit | $398.28 |
| Estimated Annual Maintenance Cost per Unit | $27.40 |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 1 | 1.00 | 8760 | $9.50 | $9.50 | -$38.33 | -$221.73 |
| 2012 | 1 | 1.00 | 8760 | $9.79 | $9.79 | -$38.33 | -$218.31 |
| 2013 | 1 | 1.00 | 8760 | $10.08 | $10.08 | -$38.33 | -$214.78 |
| 2014 | 1 | 1.00 | 8760 | $10.38 | $10.38 | -$38.33 | -$211.16 |
| 2015 | 1 | 1.00 | 8760 | $10.69 | $10.69 | -$38.33 | -$207.42 |
| 2016 | 1 | 1.00 | 8760 | $11.01 | $11.01 | -$38.33 | -$203.57 |
| 2017 | 1 | 1.00 | 8760 | $11.34 | $11.34 | -$38.33 | -$199.61 |
| 2018 | 1 | 1.00 | 8760 | $11.68 | $11.68 | -$38.33 | -$195.52 |
| 2019 | 1 | 1.00 | 8760 | $12.03 | $12.03 | -$38.33 | -$191.32 |
| 2020 | 1 | 1.00 | 8760 | $12.40 | $12.40 | -$38.33 | -$186.98 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $398.28 | -$221.73 | ($620.01) | ($620.01) |
| | 2012 | $27.40 | -$218.31 | ($245.71) | ($234.01) |
| | 2013 | $28.22 | -$214.78 | ($243.00) | ($220.41) |
| | 2014 | $29.07 | -$211.16 | ($240.23) | ($207.52) |
| | 2015 | $29.94 | -$207.42 | ($237.36) | ($195.28) |
| | 2016 | $30.84 | -$203.57 | ($234.41) | ($183.67) |
| | 2017 | $31.77 | -$199.61 | ($231.38) | ($172.66) |
| | 2018 | $32.72 | -$195.52 | ($228.24) | ($162.21) |
| | 2019 | $33.70 | -$191.32 | ($225.02) | ($152.30) |
| | 2020 | $34.71 | -$186.98 | ($221.69) | ($142.90) |
| Total | | $676.65 | -$2,050.40 | ($2,727.05) | ($2,290.96) |

**Appendix A**
**Impact of DSM Options**
**Existing Home Weatherization**

| 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)** | | | **4380** |
| | | | |
| Estimated Residential Customers | 2,427 | 2,427 | 2,427 |
| 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** | 97 | 97 | 97 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **97** | **97** | **424,860** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $380.93 | |
| Estimated Annual Maintenance Cost per Unit | $15.46 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 1 | 1.00 | 4380 | $9.50 | $9.50 | -$38.33 | -$53.86 |
| 2012 | 1 | 1.00 | 4380 | $9.79 | $9.79 | -$38.33 | -$50.44 |
| 2013 | 1 | 1.00 | 4380 | $10.08 | $10.08 | -$38.33 | -$46.92 |
| 2014 | 1 | 1.00 | 4380 | $10.38 | $10.38 | -$38.33 | -$43.29 |
| 2015 | 1 | 1.00 | 4380 | $10.69 | $10.69 | -$38.33 | -$39.56 |
| 2016 | 1 | 1.00 | 4380 | $11.01 | $11.01 | -$38.33 | -$35.71 |
| 2017 | 1 | 1.00 | 4380 | $11.34 | $11.34 | -$38.33 | -$31.74 |
| 2018 | 1 | 1.00 | 4380 | $11.68 | $11.68 | -$38.33 | -$27.66 |
| 2019 | 1 | 1.00 | 4380 | $12.03 | $12.03 | -$38.33 | -$23.45 |
| 2020 | 1 | 1.00 | 4380 | $12.40 | $12.40 | -$38.33 | -$19.12 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $380.93 | -$53.86 | ($434.79) | ($434.79) |
| | 2012 | $15.46 | -$50.44 | ($65.90) | ($62.76) |
| | 2013 | $15.92 | -$46.92 | ($62.84) | ($57.00) |
| | 2014 | $16.40 | -$43.29 | ($59.69) | ($51.56) |
| | 2015 | $16.89 | -$39.56 | ($56.45) | ($46.44) |
| | 2016 | $17.40 | -$35.71 | ($53.11) | ($41.61) |
| | 2017 | $17.92 | -$31.74 | ($49.66) | ($37.06) |
| | 2018 | $18.46 | -$27.66 | ($46.12) | ($32.78) |
| | 2019 | $19.01 | -$23.45 | ($42.46) | ($28.74) |
| | 2020 | $19.58 | -$19.12 | ($38.70) | ($24.95) |
| Total | | $537.97 | -$371.75 | ($909.72) | ($817.69) |

**Appendix A**
**Impact of DSM Options**
**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)** | 50 | **2.00** | **2.00** | |
| Annual Energy Usage | | | | |
| Energy Savings (%) | | | | |
| **Energy Savings (kWh per unit)** | | | | **8,320** |
| Estimated Commercial Customers | | 551 | 551 | 551 |
| 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** | | 110 | 110 | 110 |
| **Total Demand or Energy Savings (kW or kWh)** | | **220** | **220** | **915,200** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $870.45 | |
| Estimated Annual Maintenance Cost per Unit | $35.09 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 2.00 | 2.00 | 8320 | $9.50 | $9.50 | -$38.33 | -$90.86 |
| 2012 | 2.00 | 2.00 | 8320 | $9.79 | $9.79 | -$38.33 | -$84.02 |
| 2013 | 2.00 | 2.00 | 8320 | $10.08 | $10.08 | -$38.33 | -$76.98 |
| 2014 | 2.00 | 2.00 | 8320 | $10.38 | $10.38 | -$38.33 | -$69.72 |
| 2015 | 2.00 | 2.00 | 8320 | $10.69 | $10.69 | -$38.33 | -$62.25 |
| 2016 | 2.00 | 2.00 | 8320 | $11.01 | $11.01 | -$38.33 | -$54.55 |
| 2017 | 2.00 | 2.00 | 8320 | $11.34 | $11.34 | -$38.33 | -$46.62 |
| 2018 | 2.00 | 2.00 | 8320 | $11.68 | $11.68 | -$38.33 | -$38.45 |
| 2019 | 2.00 | 2.00 | 8320 | $12.03 | $12.03 | -$38.33 | -$30.04 |
| 2020 | 2.00 | 2.00 | 8320 | $12.40 | $12.40 | -$38.33 | -$21.38 |

| Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|
| 2011 | $870.45 | -$90.86 | ($961.31) | ($961.31) |
| 2012 | $35.09 | -$84.02 | ($119.11) | ($113.44) |
| 2013 | $36.14 | -$76.98 | ($113.12) | ($102.60) |
| 2014 | $37.22 | -$69.72 | ($106.94) | ($92.38) |
| 2015 | $38.34 | -$62.25 | ($100.59) | ($82.76) |
| 2016 | $39.49 | -$54.55 | ($94.04) | ($73.68) |
| 2017 | $40.67 | -$46.62 | ($87.29) | ($65.14) |
| 2018 | $41.89 | -$38.45 | ($80.34) | ($57.10) |
| 2019 | $43.15 | -$30.04 | ($73.19) | ($49.54) |
| 2020 | $44.44 | -$21.38 | ($65.82) | ($42.43) |
| Total | $1,226.88 | -$574.87 | -$1,801.75 | ($1,640.37) |

**Appendix A**
**Impact of DSM Options**
**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** | **0.00** | |
| | | | |
| Annual Energy Usage | | | |
| Energy Savings (%) | | | |
| **Energy Savings (kWh per unit)** | | | **1,440** |
| | | | |
| Estimated Commercial Customers | 551 | 551 | 551 |
| 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** | 138 | 138 | 138 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **276** | **0** | **198,720** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $888.40 | |
| Estimated Annual Maintenance Cost per Unit | $12.17 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 2 | 0.00 | 1440 | $9.50 | $0.00 | -$38.33 | $20.81 |
| 2012 | 2 | 0.00 | 1440 | $9.79 | $0.00 | -$38.33 | $23.09 |
| 2013 | 2 | 0.00 | 1440 | $10.08 | $0.00 | -$38.33 | $25.44 |
| 2014 | 2 | 0.00 | 1440 | $10.38 | $0.00 | -$38.33 | $27.86 |
| 2015 | 2 | 0.00 | 1440 | $10.69 | $0.00 | -$38.33 | $30.35 |
| 2016 | 2 | 0.00 | 1440 | $11.01 | $0.00 | -$38.33 | $32.92 |
| 2017 | 2 | 0.00 | 1440 | $11.34 | $0.00 | -$38.33 | $35.56 |
| 2018 | 2 | 0.00 | 1440 | $11.68 | $0.00 | -$38.33 | $38.28 |
| 2019 | 2 | 0.00 | 1440 | $12.03 | $0.00 | -$38.33 | $41.09 |
| 2020 | 2 | 0.00 | 1440 | $12.40 | $0.00 | -$38.33 | $43.97 |

| Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|
| 2011 | $888.40 | $20.81 | ($867.59) | ($867.59) |
| 2012 | $12.17 | $23.09 | $10.92 | $10.40 |
| 2013 | $12.54 | $25.44 | $12.90 | $11.70 |
| 2014 | $12.92 | $27.86 | $14.94 | $12.91 |
| 2015 | $13.31 | $30.35 | $17.04 | $14.02 |
| 2016 | $13.71 | $32.92 | $19.21 | $15.05 |
| 2017 | $14.12 | $35.56 | $21.44 | $16.00 |
| 2018 | $14.54 | $38.28 | $23.74 | $16.87 |
| 2019 | $14.98 | $41.09 | $26.11 | $17.67 |
| 2020 | $15.43 | $43.97 | $28.54 | $18.40 |
| Total | $1,012.12 | $319.37 | ($692.75) | ($734.57) |

**Appendix A**
**Impact of DSM Options**
**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)** | | | **3,600** |
| | | | |
| Estimated Commercial Customers | 551 | 551 | 551 |
| 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** | 182 | 182 | 182 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **910** | **910** | **655,200** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $617.86 | |
| Estimated Annual Maintenance Cost per Unit | $10.99 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 5 | 5.00 | 3600 | $9.50 | $0.00 | -$38.33 | $52.03 |
| 2012 | 5 | 5.00 | 3600 | $9.79 | $0.00 | -$38.33 | $57.73 |
| 2013 | 5 | 5.00 | 3600 | $10.08 | $0.00 | -$38.33 | $63.60 |
| 2014 | 5 | 5.00 | 3600 | $10.38 | $0.00 | -$38.33 | $69.65 |
| 2015 | 5 | 5.00 | 3600 | $10.69 | $0.00 | -$38.33 | $75.88 |
| 2016 | 5 | 5.00 | 3600 | $11.01 | $0.00 | -$38.33 | $82.29 |
| 2017 | 5 | 5.00 | 3600 | $11.34 | $0.00 | -$38.33 | $88.90 |
| 2018 | 5 | 5.00 | 3600 | $11.68 | $0.00 | -$38.33 | $95.71 |
| 2019 | 5 | 5.00 | 3600 | $12.03 | $0.00 | -$38.33 | $102.72 |
| 2020 | 5 | 5.00 | 3600 | $12.40 | $0.00 | -$38.33 | $109.94 |

| Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|
| 2011 | $617.86 | $52.03 | ($565.83) | ($565.83) |
| 2012 | $10.99 | $57.73 | $46.74 | $44.51 |
| 2013 | $11.32 | $63.60 | $52.28 | $47.42 |
| 2014 | $11.66 | $69.65 | $57.99 | $50.09 |
| 2015 | $12.01 | $75.88 | $63.87 | $52.55 |
| 2016 | $12.37 | $82.29 | $69.92 | $54.78 |
| 2017 | $12.74 | $88.90 | $76.16 | $56.83 |
| 2018 | $13.12 | $95.71 | $82.59 | $58.70 |
| 2019 | $13.51 | $102.72 | $89.21 | $60.38 |
| 2020 | $13.92 | $109.94 | $96.02 | $61.90 |
| Total | $729.50 | $798.45 | $68.95 | ($78.67) |

**Appendix A**
**Impact of DSM Options**
**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)** | | | **3,600** |
| | | | |
| Estimated Commercial Customers | 219 | 219 | 219 |
| 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** | 11 | 11 | 11 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **55** | **55** | **39,600** |

| | |
|---|---|
| Estimated Installation Cost per Unit | $4,127.28 |
| Estimated Annual Maintenance Cost per Unit | $272.73 |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 5 | 5.00 | 3600 | $9.50 | $0.00 | -$38.33 | $52.03 |
| 2012 | 5 | 5.00 | 3600 | $9.79 | $0.00 | -$38.33 | $57.73 |
| 2013 | 5 | 5.00 | 3600 | $10.08 | $0.00 | -$38.33 | $63.60 |
| 2014 | 5 | 5.00 | 3600 | $10.38 | $0.00 | -$38.33 | $69.65 |
| 2015 | 5 | 5.00 | 3600 | $10.69 | $0.00 | -$38.33 | $75.88 |
| 2016 | 5 | 5.00 | 3600 | $11.01 | $0.00 | -$38.33 | $82.29 |
| 2017 | 5 | 5.00 | 3600 | $11.34 | $0.00 | -$38.33 | $88.90 |
| 2018 | 5 | 5.00 | 3600 | $11.68 | $0.00 | -$38.33 | $95.71 |
| 2019 | 5 | 5.00 | 3600 | $12.03 | $0.00 | -$38.33 | $102.72 |
| 2020 | 5 | 5.00 | 3600 | $12.40 | $0.00 | -$38.33 | $109.94 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $4,127.28 | $52.03 | ($4,075.25) | ($4,075.25) |
| | 2012 | $272.73 | $57.73 | ($215.00) | ($204.76) |
| | 2013 | $280.91 | $63.60 | ($217.31) | ($197.11) |
| | 2014 | $289.34 | $69.65 | ($219.69) | ($189.78) |
| | 2015 | $298.02 | $75.88 | ($222.14) | ($182.76) |
| | 2016 | $306.96 | $82.29 | ($224.67) | ($176.03) |
| | 2017 | $316.17 | $88.90 | ($227.27) | ($169.59) |
| | 2018 | $325.66 | $95.71 | ($229.95) | ($163.42) |
| | 2019 | $335.43 | $102.72 | ($232.71) | ($157.51) |
| | 2020 | $345.49 | $109.94 | ($235.55) | ($151.84) |
| Total | | $6,897.99 | $798.45 | ($6,099.54) | ($5,668.04) |

**Appendix A**
**Impact of DSM Options**
**Interruptible Load 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)** | **10.00** | | |
| | | | |
| Annual Energy Usage | | | |
| Energy Savings (%) | | | |
| **Energy Savings (kWh per unit)** | | | **0** |
| | | | |
| Estimated Commercial Customers | 219 | 219 | 219 |
| 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** | 22 | 22 | 22 |
| | | | |
| **Total Demand or Energy Savings (kW or kWh)** | **220** | **0** | **0** |

| | | |
|---|---|---|
| Estimated Installation Cost per Unit | $1,136.36 | |
| Estimated Annual Maintenance Cost per Unit | $95.45 | |
| 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) |
|---|---|---|---|---|---|---|---|
| 2011 | 10 | 0.00 | 0 | $9.50 | $0.00 | -$38.33 | $380.00 |
| 2012 | 10 | 0.00 | 0 | $9.79 | $0.00 | -$38.33 | $391.40 |
| 2013 | 10 | 0.00 | 0 | $10.08 | $0.00 | -$38.33 | $403.14 |
| 2014 | 10 | 0.00 | 0 | $10.38 | $0.00 | -$38.33 | $415.24 |
| 2015 | 10 | 0.00 | 0 | $10.69 | $0.00 | -$38.33 | $427.69 |
| 2016 | 10 | 0.00 | 0 | $11.01 | $0.00 | -$38.33 | $440.52 |
| 2017 | 10 | 0.00 | 0 | $11.34 | $0.00 | -$38.33 | $453.74 |
| 2018 | 10 | 0.00 | 0 | $11.68 | $0.00 | -$38.33 | $467.35 |
| 2019 | 10 | 0.00 | 0 | $12.03 | $0.00 | -$38.33 | $481.37 |
| 2020 | 10 | 0.00 | 0 | $12.40 | $0.00 | -$38.33 | $495.81 |

| | Annual Cash Flows | Program Costs ($/per Unit) | Power Cost Savings ($/per Unit) | Annual Savings/ (Costs) ($/per Unit) | Present Value ($/per Unit) |
|---|---|---|---|---|---|
| | 2011 | $1,136.36 | $380.00 | ($756.36) | ($756.36) |
| | 2012 | $95.45 | $391.40 | $295.95 | $281.86 |
| | 2013 | $98.31 | $403.14 | $304.83 | $276.49 |
| | 2014 | $101.26 | $415.24 | $313.98 | $271.23 |
| | 2015 | $104.30 | $427.69 | $323.39 | $266.05 |
| | 2016 | $107.43 | $440.52 | $333.09 | $260.98 |
| | 2017 | $110.65 | $453.74 | $343.09 | $256.02 |
| | 2018 | $113.97 | $467.35 | $353.38 | $251.14 |
| | 2019 | $117.39 | $481.37 | $363.98 | $246.36 |
| | 2020 | $120.91 | $495.81 | $374.90 | $241.66 |
| Total | | $2,106.03 | $4,356.26 | $2,250.23 | $1,595.43 |

**Exhibit A**

**Clay Center Public Utilities Commission**
**Integrated Resource Plan**
**Exhibit A**
**Kansas Energy Office Programs and Initiatives**



# Kansas Energy Office

*A Division of the Kansas Corporation Commission, funded through the federal State Energy Program (SEP).*

# Recovery Act Programs and Initiatives

As part of the American Recover and Reinvestment Act (ARRA) of 2009, the State Energy Office received approximately $47.7 million in additional funding from the U.S. Department of Energy (DOE).

The funding was issued through two different federal programs:

- $38,284,000 through the State Energy Program (SEP), and
- $9,593,500 through the Energy Efficiency and Conservation Block Grant (EECBG).

## Efficiency Kansas Loan Program ($37.2 million)

This revolving loan program provides low-cost financing for energy-efficiency improvements in existing homes and small businesses. Improvements are based on the findings of a comprehensive energy audit, performed by Efficiency Kansas qualified auditors. Visit the Efficiency Kansas web site (www.efficiencykansas.com) to learn more.

The following programs and initiatives support Efficiency Kansas.

- **Energy Audit Rebates ($350,000):** To offset the costs of the energy audit, the first 1,000 participants who complete an approved project through Efficiency Kansas will receive a $350 rebate.
- **Energy Auditor Training ($100,000):** To increase the number of qualified energy auditors working statewide, three training institutions were identified as qualified to provide effective training, two of which received grants to "train the trainers" and enhance facilities. Learn more about energy auditor training.
- **Training Scholarships for Energy Auditors ($150,000):** To help more Kansans

access energy auditor training, the State Energy Office has provided 100 scholarships covering the full cost of training at one of the approved training institutions. Learn more about training scholarships for energy auditors.

- **Equipment for New Energy Auditors ($250,000):** To minimize startup costs for energy auditors, particularly for those that may have been previously unemployed, SEO has purchased 50 "packages" of equipment that energy auditors can borrow or rent (at a nominal fee) from the three qualified energy auditor training institutions and other public agencies.
- **Marketing ($500,000):** The State Energy Office contracted with Trozzolo Communications Group for professional marketing and promotional assistance.
- **Loan Fee Rebates to Lenders ($481,000):** Partner Lenders receive a $250 rebate to defray upfront administrative costs and thus reduce costs for borrowers.
- **Take Charge Challenge ($140,000):** The Energy Office is partnering with the Climate and Energy Project (CEP) to sponsor an expanded version of the Take Charge Challenge, a friendly competition among communities to reduce energy usage and promote participation in the state's energy-efficiency retrofit programs, including Efficiency Kansas, FCIP, and the low-income Weatherization Assistance Program. The Take Charge Challenge 2011 will involve 16 cities across Kansas and build on this successful strategy, recently highlighted as a best practice. See below for more details. Learn more about the Take Charge Challenge.

## Comprehensive Utility Rate Design ($1 million)

The Kansas Corporation Commission hired Christensen Associates Energy Consulting, LLC (Christensen) to assist in developing and guiding a comprehensive, collaborative planning process to redesign utility rate structures to encourage consumers to utilize energy in an efficient manner.

## Renewable Energy Incentives Grants ($2.5 million)

This grant program provides up to $250,000 to local units of government, educational institutions, and state agencies for 25% of approved costs for renewable energy projects. Learn more about renewable energy incentives grants.

## Energy Manager Grants ($1.7 million)

This grant program provides 10 public coalitions with up to 2 years of funding to hire energy managers and to fund energy efficiency expenditures. Learn more about energy manager grants.

## Public Projects Grants ($4 million)

This grant program provides a maximum of $150,000 to cities and counties for financing up to 60% of energy conservation projects in public facilities. Learn more about public projects grants.

## Take Charge Challenge ($800,000)

These funds will cover program funds for the 16 cities participating in the Take Charge Challenge (see above for more details), and also provide up to $100,000 for an energy efficiency or renewable energy project as an award for each of the 4 regional winners. Learn more about the Take Charge Challenge.

## Energy Efficiency Building Codes Working Group

To ensure timely progress towards the energy codes requirement for all recipients of federal Recovery funds, the Energy Office established the Energy Efficiency Building Codes Working Group.

Recovery.gov has more information about the U.S. Recovery Act spending.

**Sign up to receive Email Updates from the Kansas Energy Office**

- Overview of all ARRA programs at the KCC.
- Additional Programs
- EE Codes Working Group
- Energy Topics
- Charts & Graphs
- Useful Links
- Staff

State Energy Office, Kansas Corporation Commission, 1300 SW Arrowhead Road, Topeka, KS 66604-4074, 785-271-3264
URL: http://kcc.ks.gov/energy/arra.htm
Revised Friday, 17-Dec-2010 10:32:44 CST



# Kansas Energy Office

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Kansas Energy Office

- Additional Programs
- EE Codes Working Group
- Energy Topics
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- Useful Links
- Staff

Liquids Pipeline
Motor Carriers
Natural Gas Issues
Oil and Gas
Pipeline Safety
Telecom Issues
Underground Utility Damage Prevention
Video Competition

**information about energy conservation, energy efficiency, and alternative energy.**
Learn more about the Kansas Energy Office.

## Current Programs & Initiatives

- Low-cost loan program helps Kansans make energy-efficiency improvements to their homes and small businesses. And, for a limited time, you can get an Efficiency Kansas energy audit for just $100 and a $500 rebate for qualified improvements.
- Take Charge Challenge: Providing $940,000 in grant funds to sponsor this friendly competition among 16 cities to save energy in 2011.
- Facility Conservation Improvement Program (FCIP): Assists public entities in using performance contracting to finance energy-efficiency upgrades in public buildings.
- Energy Manager Grants: Local government coalitions receive funding to hire energy managers.
- Renewable Energy Incentives Grants: Up to $250,000 in grant funding to help state agencies, local governments, and educational institutions finance 25% of alternative energy projects.
- Public Projects Grant: Up to $150,000 in grant funding to help cities and counties implement energy-efficiency improvements in public facilities.
- Energy Efficiency Building Codes Working Group: Established to ensure timely progress towards the energy codes requirement for all recipients of federal Recovery

## What's New

- Updated summary of Residential and Commercial Building Codes
- Learn more about the two NEW promotional programs: $100 Energy Audit Program and $500 Thermal Envelope Program
- Helpful Information for EECBG Recipients.

## Quick Links

- ARRA Programs & Initiatives at the KCC
- ARRA Initiatives in Kansas
- Low-Income Weatherization Assistance Program
- Low-Income Energy Assistance Program (LIEAP)
- Kansas Energy Efficiency Disclosure Form
- Annual Energy Conference
- Kansas Wind Farm Map
- Kansas Biofuel Plants

funds.

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State Energy Office, Kansas Corporation Commission, 1300 SW Arrowhead Road, Topeka, KS 66604-4074, 785-271-3264
URL: http://kcc.ks.gov/energy/index.htm
Revised Tuesday, 18-Jan-2011 11:06:36 CST



# Kansas Energy Office

*A Division of the Kansas Corporation Commission, funded through the federal State Energy Program (SEP).*

# Additional Programs

Listed below are additional state and federal incentives and programs that are available to Kansas residents to encourage investments in energy efficiency and alternative energy.

Click here for programs & incentives specifically aimed at businesses.

## Energy Efficiency Incentives

### Efficiency Kansas Loan Program

**Contact: 1-877-448-3185**
This ARRA-funded revolving loan fund provides low-cost financing for cost-effective

Motor Carriers
Natural Gas Issues
Oil and Gas
Pipeline Safety
Telecom Issues
Underground Utility Damage Prevention
Video Competition

energy efficiency improvements to homes (up to $20,000) and small businesses (up to $30,000). Financing is accessed through participating lending institutions and utilities, with the State Energy Office providing oversight of energy audit process. See Efficiency Kansas web site for more details.

### Energy-efficiency Improvements to Existing Homes

**Call 1-800-829-1040 or contact your local Internal Revenue Service Office.**
For 2011, Congress has extended until December 31, 2011 the tax credit for energy-efficiency improvements to existing homes, including insulation, energy-efficient windows and doors, energy-efficienty biomass fueles stoves, and more. The tax is now capped at $500 for each homeowner, down from $1500 as previously authorized by the American Recovery and Reinvestment Act of 2009. Click here for information about qualified improvements.

### U.S. Department of Agriculture Rural Development's Home Ownership Program (502 direct and guarantee program)

**Contact: Call Norman Reed, USDA Rural Development, Kansas Office, 785-271-2718.**
This program provides very low interest loans (1%) to rural homeowners (with incomes that are 50% or less of the area's median income) for critical home improvements, which can include energy efficiency improvements such as weatherization, insulation, and new heating systems. Financing is usually limited to loans with 1% interest rates. Note: The "guaranteed" part of this program provides reduced interest rates for financing of new homes built to an approved energy-efficiency standard.

## Alternative Energy Incentives

### Plug-in Electric Vehicles Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
Individuals who purchase plug-in electric hybrids after January 1, 2009, are eligible to receive a federal income tax credit. The amount of this tax credit ranges from $2,500 to $7,500, depending on the vehicle model, and is phased out after a manufacturer has sold 250,000 eligible vehicles. Note: This is a new program under the American Recovery and Reinvestment Act of 2009.

### Alternative Motor Vehicle Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
This federal tax credit is available to individuals purchasing hybrid-electric and advanced lean burn technology vehicles from January 1, 2006, through December 31, 2010. The amount of this tax credit depends on the vehicle model; the credit is phased out after a manufacturer has sold 60,000 eligible vehicles (e.g., new purchases of vehicles manufactured by Toyota, including Lexus, or Honda no longer qualify).

### Alternative-Fuel Tax Credit

**Contact: Kansas Department of Revenue [tac@kdor.state.ks.us], 785-368-8222.**

Individuals purchasing qualified alternative-fueled vehicles after January 1, 1996, are eligible for state income tax credits, the amount of which differs depending on the weight of the vehicle and whether the vehicle was purchased before January 1, 2005. For vehicles purchased before July 1, 2007, a wide variety of alternative-fueled vehicles are eligible, but for vehicles purchased on or after July 1, 2007, only vehicles that run on biomass-derived fuels are eligible. Click here for details on eligible alternative-fueled vehicles.

## Solar Water Heating Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
This federal tax credit is available to homeowners who install qualified solar water heating systems between January 1, 2006, and December 31, 2016. The credit is equal to 30% of the costs, originally capped at $2,000, but cap has been removed for systems installed after January 1, 2009, under a provision of the American Recovery and Reinvestment Act of 2009.

## Photovoltaic Electricity Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
This federal tax credit is available to homeowners who install photovoltaic systems between January 1, 2006, and December 31, 2016. The credit is equal to 30% of the costs, originally capped at $2,000, but cap has been removed for systems installed after January 1, 2009, under a provision of the American Recovery and Reinvestment Act of 2009.

## Small Wind Energy Systems Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
Homeowners installing wind turbines from January 1, 2008, to December 31, 2016, are eligible for a tax credit equal to 30% of the turbine cost, up to $4,000 or $500 per each half kilowatt of installed nameplate capacity, whichever is less. For systems installed on or after January 1, 2009, the cap was removed under a provision of the American Recovery and Reinvestment Act of 2009.

## Geothermal Heat Pump Tax Credit

**Contact: U.S. Internal Revenue Service (IRS), 1-800-829-4933, or local IRS office**
Homeowners who install geothermal heat pumps from October 3, 2008, to December 31, 2016, are eligible for a federal tax credit equal to 30% of the unit's cost. For qualified geothermal heat pumps installed before January 1, 2009, the maximum amount that can be claimed in tax credits is $2,000. Geothermal heat pumps installed on or after January 1, 2009, are not subject to this maximum limit under a provision of the American Recovery and Reinvestment Act of 2009.

## Fuel Cell Tax Credit

**Contact: Call 1-800-829-1040 or contact your local Internal Revenue Service office.**
Homeowners installing fuel cells that have at least a half-kilowatt of capacity from January 1, 2006, to December 31, 2016, are eligible for a tax credit of 30% of cost (up to $1,500 per half kilowatt of capacity).

Click here for useful links related to tax credits.

Click here for programs & incentives specifically aimed at businesses.

- Overview of all ARRA programs at the KCC.
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- Energy Topics
- Charts & Graphs
- Useful Links
- Staff

State Energy Office, Kansas Corporation Commission, 1300 SW Arrowhead Road, Topeka, KS 66604-4074, 785-271-3264
URL: http://kcc.ks.gov/energy/other_programs.htm
Revised Tuesday, 04-Jan-2011 11:48:48 CST

**Exhibit B**

Minutes of Meeting
Of
Public Utilities Meeting
February 28, 2011

The Public Utilities Commission met in regular session with Commission Chairman Mike Floersch presiding. Present were Commissioner Don Button, Commissioner Justin Begnoche, Supt. of Utilities Bill Callaway, Councilman Jim Brown, Councilman Daton Hess, Jim Thatcher, Mayor Sharon Brown and Liana Hess, Office Manager.

The minutes of the meeting held February 14, 2011 was presented for approval. There being no objections, they were approved as read.

The Appropriations Ordinance No. 2075 (Payroll) was presented for approval. It was moved by Commissioner Justin Begnoche and seconded by Commissioner Don Button to pay the claims. The vote was all yeas.

The Appropriations Ordinance No. 2076 (Bills) was presented for approval. It was moved by Commissioner Don Button and seconded by Commissioner Mike Floersch to pay the claims. The vote was all yeas.

Supt. Callaway reported:

(1.) The Line Dept. is working on 6th Street with the FEMA rebuild.

(2.) He spoke with the City attorney regarding the water problem at 222 Pomeroy. It was decided that the owner needs to get an estimate of damages and it will be forwarded to the Public Utilities insurance company for review.

(3.) Paid for water line materials in the expenditures today. It was taken out of the electric fund as to true up because of old agreement with the City that this line would be in exchange for final payment of transfer.

(4.) He had gone to Wisconsin to visit with Fairbanks Morse regarding RICE implantation. They toured Universal Silencer Factory. Supt. Callaway went into detail of what the RICE implantation means and how it affects Clay Center.

(5.) He met with Westar and TransCanada. Communications were well established and TransCanada called this morning requesting more information.

The WAPA Integrated Resource Plan was presented on February 14, 2011 for public comment. There being no public comment it will be sent to WAPA. Commissioner Don Button made a motion to approve the Integrated Resource Plan with Commissioner Justin Begnoche seconding the motion. The vote was all yeas.

There being no further business, the Commission Meeting adjourned.

Bill Callaway, Supt. of Utilities