

CLAY CENTER, KANSAS



Integrated Resource Plan

Submitted to

Western Area Power Administration

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Table of Contents:

Section I	Introduction	4
	Purpose	4
	Methodology	4
	General Objectives	5
	Utility Profile	5
Section II	Load Forecast	6
	Load Forecast Introduction	6
Section III	Supply Side Resource Analysis	8
	Current Power Supply Arrangements	8
	Existing Supply Side Resources	8
	Owned Generation	10
	WAPA	10
	Kansas Power Pool	10
	Transmission	10
	Comparison of Loads and Resources	10
	Future Supply Side Resources	11
	Identification of Resource Options	11
	Renewable Resources	11
	Energy Purchases	11
	Evaluation Criteria	12
	Supply Side Resources Selected for Screening	12
Section IV	Demand Side Analysis	13
	Introduction	13
	Review of Load Shape Objectives	14
	Strategic Load Growth	14
	Peak Clipping	14
	Strategic Conservation	14
	Valley Filling	14
	Load Shifting	14
	Flexible Load Shape	15
	DSM Program Evaluations	15
	Residential Central Air Conditioning Load Cycling	15
	Residential Electric Water Heater Load Shedding	15
	Residential High Efficiency Central Air Conditioners	15
	Old Refrigerator Pick-up Program	16
	Loan Program for AC Replacement	16
	Energy Star® Home Construction	16
	Existing low-income Home Weatherization	17
	Commercial High-Efficiency Lighting Conversions	17
	Commercial High-Efficiency Air Conditioners	17
	Commercial HVAC Efficiency Improvement Program	17
	Large Customer Customized Rebate Program	17
	Interruptible Load Purchase Program	18
	Screening Analysis	18
	Qualitative Screening	18
	Economic Evaluation	22

TOC continued

Section V	Supply/Demand Side Resource Integration	23
	Development of Integrated Resource Plan	23
	Preferred Alternative	24
	Note: Environmental Impact	24
	Note: Qualifying Facilities	25
Section VI	Action Plans	25
	Two Year Action Plan	25
	Long Term Action Plan	26
Public Participation		28
 Tables, Figures, Exhibits		
Table 1	Peak Demand and Energy Requirements	7
Table 2	Existing Generating Resources	9
Table 3	Comparison of Peak Demand and Energy Requirements	9
Table 4	Qualitative Screening Residential Measures DSM	21
Table 5	Qualitative Screening Commercial, Industrial Measures DSM	21
Table 6	DSM Options Offered	27
Figure 1	Total Energy Forecast and DSM Energy Savings	27
Exhibit A	Detailed information available from the Kansas Corporation Commission	28
	USDA Single Family Housing Direct Home Loans	
	Federal Tax Credit for Consumer Energy Efficiency	
	Alternative Fuel Tax Credit	

Section I. Introduction

This is the 5-Year Integrated Resource Plan (IRP) for the Clay Center Public Utilities (Kansas) Commission (CCPUC). The IRP was principally developed by the Kansas Power Pool (KPP) in support of the membership of CCPUC in KPP. The IRP identifies CCPUC's resource requirements for the 10-year period beginning fiscal year 2016 through fiscal year 2025.

Purpose

CCPUC is responsible for serving the City of Clay Center with electricity and water services. Western Area Power Administration (WAPA) instituted a program call the Energy Planning and Management Program (EPAMP). EPAMP includes a provision that requires its customers to prepare and submit an IRP to WAPA in order to maintain its current allocations of power and energy from WAPA. This IRP is being completed to meet WAPA's requirement.

The purpose of the IRP is to restate 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, and;
- Solicited public comments to a draft report and incorporated public comments in the 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

With a population of approximately 4,300, Clay Center is the county seat of Clay County. Having a land base of approximately 18 square miles, it is located at the junction of US-24 and K-15 in northeastern Kansas. Its utility provider, the CCPUC, is a not-for-profit municipally owned electric utility that is comprised of both generation and distribution assets. It serves approximately 3,000 retail electric meters and owns an electric distribution system – the vast majority of which serves customers inside its City limits. In 2015, the electric customer were segmented in the following customer classes:

- Residential – 2,441 (representing a 0.2% increase over the previous IRP)
- Commercial – 354 (representing a 5% increase over the previous IRP)
- Industrial – 202 (representing a 9% decrease from the previous IRP)

Although specific sector forecast data are not available, aggregate summaries imply growth during the next 10 years to be essentially flat or slightly negative. In the aggregate, regional growth is projected to be 0.4% over the next 50 years.¹

CCPUC is a summer peaking utility with a system peak of 14,420 kW in July 2015. CCPUC's annual energy usage was 53,556 MWh in 2015, for an annual load factor of 42.39%.

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's vision and mission is to focus on providing the most effective and efficient wholesale electric service to its members.

Section II. Load Forecast

Load Forecast Introduction

Historical data were gathered from CCPUC and used in preparing the load forecast. Previous IRP submissions indicated Clay Center would partner 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. Westar eventually constructed this line although it is not connected as had been previously planned. The pumping station had been projected to add 20-25 MW of load beginning in 2013. The approval for the construction of the pumping station has not yet achieved the necessary approvals by the U.S. State Department and has consequently been removed from KPP operating budgets. Also, it is not reflected in this IRP. Although the pumping station load has not yet come on line as anticipated, a switching station has been constructed which connects to the Westar 115 kV line. To the north of the switching station, a segment of 115kV line has been constructed to eventually step-down to distribution voltage at CCPUC's power plant.

¹ This is projected to be slightly lower than Kansas' annual average population growth from 1960 to 2010, which was 0.5 percent. Over the forecasted period, Kansas' overall annual population growth rate is forecast to decline from 0.5 percent in 2019 to 0.3 percent in 2064. Wichita State University Center for Economic Development and Business Research; www.cedbr.org.

Load projections were based on historical data through 2015. The Net System Peak and Net System Energy forecast with assumptions are presented in Table 1. Forecasted annual energy growth rates are shown for the periods of 2016 through 2025.

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

Year	Net System Peak In MW *	% Change from prev	Net System Energy Energy mWh **	% Change from prev	Load Factor %
2005	19.96	42.06	53699	4.95	30.71
2006	16.00	-19.84	53521	-0.33	38.19
2007	15.20	-5.00	55055	2.87	41.35
2008	14.60	-3.97	56743	3.07	44.26
2009	13.61	-6.78	54337	-4.24	45.59
2010	16.27	19.57	58826	8.26	41.28
2011	14.46	-11.12	57554	-2.16	45.44
2012	15.51	7.26	58236	1.21	42.85
2013	15.68	1.10	56016	-3.81	40.78
2014	15.97	1.84	55221	-1.42	39.46
2015	14.42	-9.71	53556	-3.02	42.39
2016	14.71	1.98	51451	-3.93	39.93
2017	14.48	-1.56	54415	5.76	42.90
2018	14.64	1.10	56124	3.14	43.76
2019	14.90	1.78	58184	3.67	39.30
2020	15.06	1.07	58760	0.99	44.54
2021	15.26	1.33	59348	1.00	44.40
2022	15.48	1.44	59941	1.00	44.20
2023	15.68	1.29	60540	1.00	44.07
2024	15.87	1.21	60570	0.05	43.57
2025	16.07	1.26	60649	0.13	43.08

Footnotes:

* Inclusive of KPP and WAPA meter readings for the yearly peak demand

** Inclusive of energy supplied by KPP, WAPA and self-supply

Years 2005 - 2010 reflective of information found in 2011 IRP

Years 2011 - 2015 based on actual, historical data versus 2011 IRP

Years 2016 - 2025 based on KPP aggregate forecast performed in 2015

Section III. Supply Side Resource Analysis

Current Power Supply Arrangements

The CCPUC distribution system facilitates deliveries from both owned and purchased power supply resources. It is connected to the bulk transmission system at 115 kV. In the IRP submitted in 2011, it was stated that in 2012, CCPUC, in coordination with KPP, planned to construct eight and a half (8.5) miles of new 115 kV transmission line to a new 115 to 34.5 KV substation. This new substation would 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 would be used for emergency back-up. The transmission line projected was commenced and completed in 2013. The final construction payment was made in 2015. These additions are estimated to result in minimal reductions to transmission losses and such amounts are not included in this analysis.

Existing Supply Side Resources

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

Table 2
Clay Center Public Utilities Commission
Existing Generating Resources

Source	2015 Capacity MWs	2015 Energy mWh	% of Energy	2016 Projected Capacity	2016 Projected Energy	% of Energy
CCPUC Generation	22.00	25,402	0.05	22.00	25,726	0.05
WAPA	1.60	5,218	0.01	1.60	5,145	0.01
Kansas Power Pool (3)		48,313,313	99.94		51,420,454	99.94
Total		48,343,933	100		51,451,325	100

(1) 2015 capacity testing not reflected

(2) Per WAPA contract

(3) KPP has all requirements contract supplemental to WAPA allocation to CCPUC

Table 3
Clay Center Public Utilities Commission
Comparison of Peak Demand and
Energy Requirements

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Demand										
Peak *	16.62	16.36	16.54	16.84	17.02	17.24	17.49	17.72	17.93	18.16
Resources **	23.60	23.60	23.60	23.60	23.60	23.60	23.60	23.60	23.60	23.60
Surplus(Deficit)	6.98	7.24	7.06	6.76	6.58	6.36	6.11	5.88	5.67	5.44

Notes:

* Inclusive of 13% reserve requirement, recognizes Clay Center summer peak

** Inclusive of WAPA and CCPUC internal resources only - and not KPP resource

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 current agreement terminates in September 2024. A successor agreement is to commence in October 2024.

Kansas Power Pool. KPP provides all supplemental requirements to CCPUC. Thus, all load growth is supplied and planned for CCPUC by KPP. The KPP portfolio is comprised of a variety of fuel types as well as owned, and contracted for, generating resources. The adequacy of resources to supply needs for CCPUC as well as all KPP member communities, extends through 2032 and beyond inclusive of reserves and both capacity and energy surpluses.

In the IRP submitted in 2011, reference was made to the contract with KPP expiring in 2020. That contract has since been restated with an expiration coincident to the complete repayment of any KPP bond indebtedness. Current indebtedness is scheduled for full repayment before the end of 2032.

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 termination provision.

Comparison of Loads and Resources

In previous submissions of the IRP the balance of loads and resources was shown graphically. Forecasted peak demand and energy requirements were summarized and compared to existing capacity and energy resources. With the advent of the Integrated Market (IM) of the Southwest Power Pool, it is believed that such an analysis is unnecessary. This is true for at least two reasons. First, all energy is now purchased from the SPP market rather than from a dedicated generating resource. Secondly, it can be shown that KPP has sufficient generating resource to bid into the SPP

market for at least through the year 2022 (study period).

Accordingly, CCPUC has sufficient capacity and energy resources through the period prior to submitting of the 2021 IRP. Further, traditional discussions pertaining to run decisions made by the generator owner are now modified by the advent of the IM. The Supply Side Evaluation Criteria and other discussions traditionally made a part of the IRP are included herein but must be understood in the context of the IM.

Future Supply Side Resources

CCPUC is included in KPP joint planning process by virtue of its membership in KPP. Moreover, CCPUC is influential in the long-term planning and resource acquisition process. KPP coordinates long-term power supply plans for all of its members to meet the electric power needs for those members throughout the state of Kansas. Critical to this joint coordination and planning is the identification of resource options. Resource acquisitions and commitments from prior years have resulted in long positions for both capacity and energy. This is especially true pending the onset of oil pumping station load. The following is a description of the process for power supply screening.

Identification of Resource Options

Renewable Resources. CCPUC, through its membership in KPP, is involved in renewable resource planning. KPP has included renewable resources in its resource portfolio, including, but not limited to SWPA hydro power allocations and pooled participation in Grand River Dam Authority. With decision input from CCPUC, KPP contracted in 2015 to off-take 25 MWs of energy from the Marshall County Wind project in northeast Kansas. Under this pooling arrangement, this resource will contribute to the provision of energy consumed by the CCPUC.

Energy Purchases. Open market power and energy purchases from other utilities 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

Introduction

DSM programs for CCPUC customers are available through KPP and the Kansas Department of Energy. Some programs provide low interest loans and grants to finance approved energy efficiency appliance purchases. Improvements may be a variety of options including siding, windows, insulation, energy audits and weatherization of buildings.

See <http://www.kcc.state.ks.us/energy>

There are energy efficiency rebates for renewable energy generators and performance contracting. The revolving loan fund program (referenced below) 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).

- 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 and similar programs.

Review of Load Shape Objectives

The Electric Power Research Institute (EPRI) 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 examples.

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. Twelve types of DSM programs have been 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 would be financially incentivized in anticipation of an average load reduction per control device on residential homes.

2. Residential Electric Water Heater Load Shedding

A customer financial incentive 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 would provide cash rebates. If the program were offered, 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 14. Local contractors market high efficiency equipment. Rebates or incentives may be provided from manufacturers.

4. 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 payment, as advertised, for refrigerator or freezer. A regional contractor picks up the units and delivers them to a de-qualifying operating manufacturing facility. This utility program is funded by the Kansas Power Pool.

5. 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 CCPUC could direct customers to the Kansas Energy Office's low interest loan program to finance energy efficiency measures a homeowner or business owner is considering. This is a revolving loan fund and may include a performance contracting element to ensure that the systems are built to specification, and expected energy use parameters are met.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. Interruptible Load Purchase Program

Large Industrial customers would receive payments for interrupting all or part of their load during peak periods when asked by CCPUC/KPP. The customer signs a contract 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.

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 is 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 Western Area Power Administration 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 0-3 according to their ability to satisfy each of the preceding criteria. Those technologies with higher total scores were considered more likely to be successful in achieving CCPUC's load shape objectives. Tables 4 and 5, shown on the following page, indicate 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 twelve technologies for economic evaluation. The options that passed the qualitative screening included nine residential options, and five commercial and 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 Measures DSM

Technology Alternative	Cost	Customer	Environ'l	Market	Ease of	Comm'l	Total
		Preference	Impact	Potential	Implement'	Availability	
Resident'l Central A/C Cycling	2	2	2	3	2	3	14
Resident'l Water Heater Shedding	2	3	3	1	3	3	15
Resident'l High Efficiency A/C	2	3	3	3	2	3	16
Room and Window A/C Rebates	3	3	3	3	3	3	18
High Efficiency Refrigerator Rebates	3	3	3	3	3	3	18
Old Refrigerator Pick-up	3	2	3	3	2	3	16
Loan Program for A/C 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
Comm'l/Ind'l Measures DSM

Technology Alternative	Cost	Customer	Environ'l	Market	Ease of	Availability	Total
		Preference	Impact	Potential	Implement''	Reliability	
Comm'l High-Efficiency Lighting	3	2	3	2	2	3	15
Comm'l High-Efficiency A/C	1	2	3	2	2	3	13
Comm'l HVAC Eff'cy Improvement	2	3	3	2	3	3	16
Large Customer Customized Rebate	2	3	3	2	2	3	15
Interruptible Load Program	3	2	3	1	1	3	13

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.
- 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 twelve 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 2016 Dollars. DSM options with a positive net present value were considered economically viable.

Primarily due to the fact that CCPUC's power supply costs are competitive, as well as CCPUC's influence on the strategic power supply planning and acquisition by KPP, it appears the only DSM options economically feasible are those programs promoted and funded by KPP and which are shown below.

Further to the conclusion arrived at, and stated above CCPUC will continue promoting low-cost DSM options illustrated in Table 6. Those options as highlighted as follows:

1. Heat Pump replacement according to program requirements
2. Residential High-Efficiency Central Air Conditioners according to program requirements
3. High efficiency electric water heaters according to program requirements
4. Refrigerator upgrades according to program requirements

The promotion of these programs will occur via the CCPUC website and through customer flyers.

Section V. Supply/Demand Side Resource Integration

Development of Integrated Resource Plan

Least cost supply resources were reviewed by CCPUC in collaboration with KPP. This review first considered information contained in the Burns &McDonnell Joint Resource Planning Study prepared for Kansas Municipal Utilities on August 11, 2010. The review of that information has been updated through the KPP aggregate planning processes for each of its member cities. Projected baseload growth rate for energy was also considered as referenced in Table 1.

Preferred Alternative

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

- Maintain the existing long-term contract with KPP (through at least 2032) consider an extension depending on terms and conditions.
- Additional resources from KPP are not needed within the 10-year study period.
- Limit promotion of DSM programs. Implementation of such programs to the extent that energy savings exceeds 1% of current energy usage is counter to the financial and operational commitments that CCPUC has to its wholesale power provider.

Note: Environmental Impact

- CCPUC holds a Class 1 operating permit through the Kansas Department of Health and Environment, and complies with applicable provisions of the Clean Air Act Clean Water Act at its power plant and substation facilities.
- Recent Environmental Protection Agency (EPA) rules on compliance with Reciprocating Internal Combustion Engines (RICE) required upgrades to CCPUC generation facilities. Those retrofits on CCPUC generating facilities were completed in 2015. Those facilities have been compliant since that time and 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.

Note: Qualifying Facilities

- 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 CO₂, SO_x and NO_x gases emitted. Except as noted above, no specific recommendation is made here.

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. Further illustration is shown on Table 6.

- Use the CCPUC website to re-publish viable energy efficiency programs available through the Energy Division of the Kansas Corporation Commission
- Partner with KPP to offer incentives and rebates on the following programs:
 - Heat pump replacements offering financial incentives according to program requirements
 - Air conditioner replacement program offering financial incentives according to program requirements
 - High efficiency electric water heater replacements offering financial incentives according to program requirements

- Refrigerator upgrades offering financial incentives according to program requirements
- Promote DSM programs such as energy efficiency lighting and heat pump promotion via the CCPUC website and contractor education.
- 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 modify this plan when significant cost impacts are discovered.

Long Term Action Plan

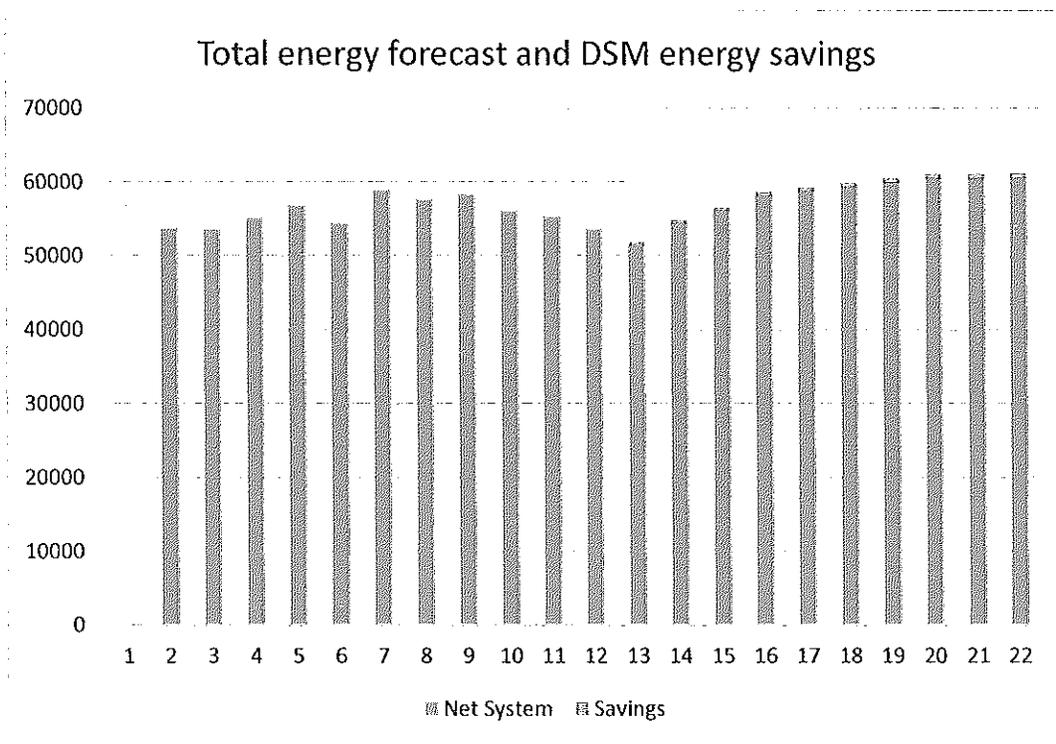
Based on the assumptions used, and analyses completed, the following Long Term Action Plan is recommended.

- The KPP contract is effective through 2032 or until all bonds are repaid, whichever is later. CCPUC should evaluate power supply options thereafter 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.

Table 6
Clay Center Public Utilities
Commission
DSM Options Offered

Technology Alternative	Rebate or Refund Offered	Efficiency Requirement
Heat Pump replacements	\$75 or more depending on sizing	SEER 14 or greater
Air conditioner replacements	\$75	SEER 14 or greater
Water heater replacements	\$75	EF 14 or greater
Refrigerator upgrades	\$30	Energy Star or better

Figure 1



Note: Total system energy forecast is shown above to replicate forecast shown in Table 1. Energy savings attributable to DSM are not shown for years 2005 – 2015. As noted, DSM program offerings should be limited so as to avoid causing energy savings to exceed 1% of total system energy requirements (See Section V – Preferred Alternative). It is anticipated that further adoption of DSM technologies will be accepted at a rate of .25% growing to 1% by 22 (2025).

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 IRP was presented at a public hearing portion of the regularly scheduled meeting of the CCPUC on July 5, 2016. The purpose of the hearing was to provide information and gather input from groups or individuals with an interest in CCPUC's IRP. Notices of the public hearing had been previously published 3 times in the local newspaper, the Clay Center Dispatch.

Notices were also posted at the CCPUC offices. The public Notice indicated the CCPUC's intent as stated above. No public comments or questions were fielded or received. However, the CCPUC is committed to receiving such comment throughout the ensuing period and considering modifications to the IRP as warranted. The IRP will be posted on the CCPUC website for public review and comment.

EXHIBIT A

Energy efficiency rebates for renewable energy generators or energy efficiency installations. As referenced in Section IV, the following are programs and funds promoted to the public through this IRP and the CCPUC website. Details are shown following.



Single Family Housing Direct Home Loans Program 101

Program Status: Open

Program Factsheet: PDF

What does this program do?

Also known as the Section 502 Direct Loan Program, this program assists low- and very-low-income applicants obtain decent, safe and sanitary housing in eligible rural areas by providing payment assistance to increase an applicant's repayment ability. Payment assistance is a type of subsidy that reduces the mortgage payment for a short time. The amount of assistance is determined by the adjusted family income.

Who may apply for this program?

A number of factors are considered when determining an applicant's eligibility for Single Family Direct Home Loans. At a minimum, applicants interested in obtaining a direct loan must have an adjusted income that is at or below the applicable low-income limit for the area where they wish to buy a house and they must demonstrate a willingness and ability to repay debt.

Applicants must:

- Be without decent, safe and sanitary housing
- Be unable to obtain a loan from other resources on terms and conditions that can reasonably be expected to meet
- Agree to occupy the property as your primary residence
- Have the legal capacity to incur a loan obligation
- Meet citizenship or eligible noncitizen requirements
- Not be suspended or debarred from participation in federal programs

Properties financed with direct loan funds must:

- Generally be 2,000 square feet or less
- Not have market value in excess of the applicable area loan limit
- Not have in-ground swimming pools
- Not be designed for income producing activities

Borrowers are required to repay all or a portion of the payment subsidy received over the life of the loan when the title to the property transfers or the borrower is no longer living in the dwelling.

Applicants must meet income eligibility for a direct loan. Please select your state from the dropdown menu above.

What is an eligible area?

Generally, rural areas with a population less than 35,000 are eligible. Visit the [USDA Income and Property Eligibility website](#) for complete details.

How may funds be used?

Loan funds may be used to help low-income individuals or households purchase homes in rural areas. Funds can be used to build, repair, renovate or relocate a home, or to purchase and prepare sites, including providing water and sewage facilities.

How much may I borrow?

The maximum loan amount an applicant may qualify for will depend on the applicant's repayment ability. The applicant's ability to repay a loan considers various factors such as income, debts, assets and the amount of payment assistance applicants may be eligible to receive. Regardless of repayment ability, applicants may never borrow more than the Area's Loan Limits (plus certain costs allowed to be financed) for the county in which the property is located.

What is the interest rate and payback period?

- Fixed interest rate based on current market rates at loan approval or loan closing, whichever is lower
- Interest rate when modified by payment assistance, can be as low as 1%
- Up to 33 year payback period - 38 year payback period for very low income applicants who can't afford the 33 year loan term

How much down payment is required?

No down payment is typically required. Applicants with assets higher than the asset limits may be required to use a portion of those assets.

Is there a deadline to apply?

Applications for this program are accepted through your local RD office year round.

How long does an application take?

Processing times vary depending on funding availability and program demand in the area in which an applicant is interested in buying and completeness of the application package.

What governs this program?

- The Housing Act of 1949 as amended, 7 CFR, Part 3550,
- HB-1-3550 - Direct Single Family Housing Loans Field Office Handbook

Why does USDA Rural Development do this?

USDA Rural Development's Section 502 Direct Loan Program provides a path to homeownership for low- and very-low-income families living in rural areas, and families who truly have no other way to make affordable homeownership a reality. Providing these affordable homeownership opportunities promotes prosperity, which in turn creates thriving communities and improves the quality of life in rural areas.

NOTE: Because citations and other information may be subject to change please always consult the program instructions listed in the section above titled "What Law Governs this Program?" You may also contact *your local office* for assistance.

Forms & Resources

NOTE: If state specific forms are not shown above, please refer to the application materials listed below to start the process of applying. Please ensure that your state is selected in the dropdown menu above to find the State Office contact information **where you would like to purchase a home**

and speak to a [Housing Program Specialist](#) before attempting to fill out any forms or applications. This will save you valuable time in the process.

Need to refinance your USDA Home Loan? Learn more about this option.

Eligibility Income limits (pdf) are determined by the location of the home and the number of family members in the home.

The Direct Home Loan program also allows loans only up to the Area Loan Limits (pdf) for an area.

Please visit the Eligibility Site to find out if your area is an eligible rural area before applying for a home loan.

For Current Borrowers, please see the Customer Service Guide (pdf) for your Loan | or the Spanish version (pdf)

Interest Rates

Effective July 1, 2016, the current interest rate for Single Family Housing Direct Home Loans is 3.00% for low and very low income borrowers.

Federal Income Tax Credits for Energy Efficiency

A number of tax credits for residential energy efficiency have been renewed. These tax credits are available for purchases made in 2016, as well as retroactive to purchases made in 2015. ENERGY STAR products eligible for tax credits are independently certified to save energy, save money and protect the environment. Use up to 30% less energy in your home by outfitting it with ENERGY STAR products available across more than 70 categories. *

2016 Federal Tax Credits

Tax Credit: 10% of cost up to \$500 or a specific amount from \$50-\$300.

Expires: December 31, 2016

Details: Must be an existing home & your principal residence. New construction and rentals **do not** apply.

Biomass Stoves

Air Source Heat Pumps

Central Air Conditioning (CAC)

Gas, Propane, or Oil Hot Water Boiler

Gas, Propane or Oil Furnaces and Fans

Insulation

Roofs

Water Heaters (non-solar)

Windows, Doors & Skylights

Tax Credit: 30% of cost with no upper limit

Expires: December 31, 2016

** (Tax credits for Solar Energy Systems are available at 30% through December 31, 2019.*

The credit decreases to 26% for tax year 2020; drops to 22% for tax year 2021 then expires December 31, 2021)

Details: Existing homes and new construction qualify. Both principal residences and second homes qualify. Rentals **do not** qualify.

Geothermal Heat Pumps

Small Wind Turbines (Residential)

Solar Energy Systems *

Tax Credit: 30% of cost with no upper limit

Expires: December 31, 2016

Details: Existing homes and new construction qualify. Must be your principal residence. Rental homes and second homes do not qualify.

Fuel Cells (Residential Fuel Cell and Microturbine System)

** The tax credit information contained within this website is provided for informational purposes only and is not intended to substitute for expert advice from a professional tax/financial planner or the IRS.*

RELATED RESOURCES

- [How do I apply for a Federal Tax Credit](#)
- [Tax incentives for cars](#)
- [Home Builders](#)
- [Commercial Buildings](#)
- [Tax Credit FAQs](#)

PRODUCT FINDER



Looking for a specific ENERGY STAR certified product model?

[START HERE](#)

REBATE FINDER



ENERGY STAR partners sponsor rebates on certified products. Enter a zip code below to find deals near you!

[SUBMIT](#)

A vertical rectangular graphic with a textured, grey background. At the top, the text 'JOIN MY ENERGY STAR AND SAVE EVEN MORE!' is displayed in white, with 'JOIN' on the first line, 'MY ENERGY STAR' in a larger font on the second line, and 'AND SAVE EVEN MORE!' on the third line. Below this, a dark grey rectangular box contains the text 'SIGN UP WITH MY ENERGY STAR TO:' in white. Underneath this box is a bulleted list of three items: '• Track the changes you made in your home last year', '• Get product rebates', and '• Find energy-saving tips.' At the bottom of the graphic is a white rectangular button with the text 'GET STARTED' in black.

JOIN
MY ENERGY STAR
AND SAVE EVEN MORE!

**SIGN UP WITH
MY ENERGY STAR TO:**

- Track the changes you made in your home last year
- Get product rebates
- Find energy-saving tips.

GET STARTED

[Larger Font](#) | [Smaller Font](#)

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Alternative-fuel Tax Credit

INCOME TAXPAYER-Effective for all taxable years beginning after Dec. 31, 1995.

Beginning in tax year 2013, this credit shall only be available to corporations that are subject to the Kansas corporate income tax, i.e. C corporations. This credit shall not be available to individuals, partnerships, S corporations, limited liability companies, and other pass-through entities.

Any person, association, partnership, limited liability company, limited partnership, or corporation who owns and operates a qualified alternative-fueled motor vehicle licensed in the State of Kansas or who makes an expenditures for a qualified alternative-fuel fueling station during the tax year qualifies for an income tax credit.

QUALIFICATIONS

The taxpayer must:

- make expenditures for a qualified alternative-fueled motor vehicle; or,
- make expenditures for a qualified alternative-fuel fueling station.

Credit Amount

For any qualified alternative-fueled motor vehicle placed in service on or after Jan. 1, 1996 and before Jan. 1, 2005, the credit is 50 percent of the incremental cost or conversion cost for each qualified alternative-fueled motor vehicle, up to a maximum of \$3,000 per qualified vehicle with a gross weight of less than 10,000 lbs.; \$5,000 for a heavy duty motor vehicle with a gross vehicle weight of greater than 10,000 lbs. but less than 26,000 lbs.; and \$50,000 for motor vehicles having a gross vehicle weight of greater than 26,000 lbs.

For any qualified alternative-fueled motor vehicle placed in service on or after Jan. 1, 2005, the credit is 40 percent of the incremental cost or conversion cost for each qualified alternative-fueled motor vehicle, up to \$2,400 per qualified vehicle with a gross vehicle weight of less than 10,000 lbs.; \$4,000 for a heavy duty motor vehicle with a gross vehicles weight of greater than 10,000 lbs. but less than 26,000 lbs.; and \$40,000 for motor vehicles having a gross vehicle weight of greater than 26,000 lbs.

For any qualified alternative-fuel fueling station placed in service on or after Jan. 1, 1996, and before Jan. 1, 2005, the credit is 50 percent of the total amount expended for each qualified alternative-fuel fueling station but not to exceed \$200,000 for each fueling station.

For any qualified alternative-fuel fueling station placed in service on or after Jan. 1, 2005, and before Jan. 1, 2009, the credit is 40 percent of the total amount expended for each qualified alternative-fuel fueling station, up to \$160,000 for each fueling station.

For any qualified alternative-fuel fueling station placed in service on or after Jan. 1, 2009, an amount equal to 40 percent of the total amount expended for each qualified alternative-fuel fueling station, but not to exceed \$100,000 for each fueling station.

If no credit is claimed for any of the above, a credit will be allowed in an amount not to exceed the lesser of five percent of the cost of the vehicle or \$750 to any taxpayer who purchases a motor vehicle equipped by the vehicle manufacturer with an alternative fuel system and who is unable or elects not to determine the exact basis attributable to such property.

The credit for motor vehicles which are capable of operating on a blend of 85 percent ethanol and 15 percent gasoline shall be allowed for taxable years commencing after Dec. 31, 1999, only if the individual claiming the credit furnishes evidence of the purchase, during the period of time beginning with the date of purchase of the vehicle and ending on Dec. 31 of the next succeeding calendar year, of 500 gallons of ethanol and gasoline blend as may be required.

LIMITATION OF CREDIT

The amount of credit which exceeds the tax liability may be carried forward to the next three tax years or until used whichever is earlier.

For those alternative-fuel fueling stations placed in service on or after Jan. 1, 2009, the amount of credit which exceeds the tax liability may be carried forward to the next four tax years or until used, whichever is earlier.

PROCEDURES TO CLAIM THE CREDIT

You may download Schedule K-62 to claim the alternative-fuel tax credit. This schedule must be completed and submitted with the income tax return. You may also call the Department of Revenue voice mail system at 785-296-4937 to request Schedule K-62. You will be asked to give your name, address, phone number and form(s) you desire. Please allow two weeks for delivery of your forms.

[Back to Tax Credits page.](#)

ALTERNATIVE-FUEL DEFINITIONS

Taxpayer

Taxpayer means any person who owns and operates a qualified alternative-fueled vehicle licensed in the state of Kansas or who makes an expenditure for a qualified alternative-fuel fueling station.

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Incremental Cost

Incremental cost means the cost that results from subtracting the manufacturer's list price of the motor vehicle operating on conventional gasoline or diesel fuel from the manufacturer's list price of the same model motor vehicle designed to operate on an alternative fuel.

[Back to credit amount](#)

Conversion cost

Conversion cost means the cost that results from modifying a motor vehicle which is propelled by gasoline or diesel to be propelled by an alternative fuel.

[Back to credit amount](#)

Alternative Fuel

Prior to July 1, 2007, alternative fuels include:

- Methanol, denatured ethanol and other alcohols (100 percent)
- E-85 Fuels-mixtures containing 85 percent or more by volume (but not less than 70 percent) of methanol, denatured ethanol and other alcohols with gasoline or other fuels
- Natural gas (compressed or liquid)
- Liquefied Petroleum Gas
- Hydrogen
- Coal-Derived Liquid Fuels
- Fuels (other than alcohol) derived from biological materials (such as biodiesel)
- Electricity (including electricity from solar energy)
- Any other fuel determined by the U.S. Department of Energy that is substantially not petroleum and yields substantial energy security and environmental benefits.

On and after July 1, 2007, alternative fuel means a combustible liquid derived from grain starch, oil seed, animal fat or other biomass; or produced from biogas source, including any nonfossilized, decaying, organic matter.

[Back to credit amount](#)

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