

CENTRAL VALLEY ELECTRIC COOPERATIVE, INC.

2009 INTEGRATED RESOURCE PLAN



Central Valley Electric Cooperative, Inc.

2009 Integrated Resource Plan

Table of Contents

	Page
UTILITY BACKGROUND	2
UTILITY PROFILE DATA (2008)	2
LOAD FORECASTING INFORMATION	3
EXISTING ENERGY RESOURCES	3
WESTERN AREA POWER ADMINISTRATION	3
XCEL ENERGY	4
IDENTIFYING OTHER RESOURCE OPTIONS	4
SUPPLY-SIDE OPTIONS	5
<i>Wind Energy</i>	5
<i>Biomass (Municipal Solid Waste MSW):</i>	7
<i>Solar Energy</i>	7
<i>Demand-side Options</i>	8
<i>Marathon Water Heater Energy Efficiency Program</i>	8
<i>Compact Fluorescent Light Bulb Energy Efficiency Program</i>	9
<i>Interruptible Rate Program</i>	10
<i>Participant's Perspective</i>	10
<i>Ratepayer Perspective</i>	10
<i>Utility Perspective</i>	10
<i>Total Resource Cost Perspective</i>	10
PROGRAM ASSUMPTIONS	10
PROPOSED RESIDENTIAL PROGRAMS	11
ENERGY EFFICIENCY KITS	11
ENERGY EFFICIENCY LOAN PROGRAM	12
POWER BOSS MOTOR CONTROLLER ENERGY EFFICIENCY PROGRAM	15
ENERGY EFFICIENCY OBJECTIVES & GOALS	15
LEAST-COST OPTIONS	17
IRP ACTION PLAN	17
TWO YEAR PLAN	17
FIVE YEAR PLAN	18
VALIDATION AND EVALUATION	18
ENVIRONMENTAL EFFECTS	19
GOVERNING BODY APPROVAL AND PUBLIC PARTICIPATION	19
APPENDICES	
A - 2008 LOAD FORECAST STUDY	20
B - NEW MEXICO WIND RESOURCE MAP	22
C - AFFIDAVIT OF PUBLICATION	23

UTILITY BACKGROUND

Central Valley Electric Cooperative, Inc. (CVE) is a consumer owned, RUS utility serving over 12,000 meters. Central Valley Electric serves members in Eddy, Chaves, and portions of Lea and Otero counties in southeastern New Mexico. CVE derives its power needs from purchase contracts provided by Xcel Energy and Western Area Power Administration (WAPA).

CVE's peak demand for 2008 was over 100 megawatts, with energy sales near 755 million kilowatt hours. The historical growth rate for CVE the past 5 years has been an average of 3.8% per year for capacity and an average of 5.4% per year for energy. This growth is projected to continue due to a strong economy and continued oil and gas exploration. With this expected growth, CVE needs to evaluate the most cost effective way to meet the future power needs of its customers; either through demand-side resource programs or possibly through the addition of supply-side resources.

With the utility industry changing as rapidly as it has in the past couple of years, it is difficult to make specific long term plans because of the uncertainty in the industry. Flexibility will be the key for CVE to compete in a changing market.

UTILITY PROFILE DATA (2008)

System Peak: 115,436 KW Date: June 2008
Energy Sales: 740,109,522
Annual Load Factor: 77.33

Generation and Purchases:

A. Contract Energy Purchases	
1. Xcel Energy	767,088,462
2. Western Area Power Administration	14,874,038
B. Total Purchases (without losses)	781,962,500
C. System Losses	65,687,827
D. System Losses in Percent	5.30%
E. Total Energy to Customers	740,109,522

Number of Customers & Energy Delivered By Customer Class:

<u>Customer Class:</u>	<u># of Customers:</u>	<u>kWhs:</u>
Residential	5,031	58,584,666
Commercial	825	14,245,709
Irrigation	654	60,653,168
Industrial	1,301	528,340,044
Oil Wells	4,695	75,653,220
Office		441,960
TOTALS	12,130	737,918,767

LOAD FORECASTING INFORMATION

Central Valley Electric utilizes its historical data to project future load growth. Although there are several methodologies used in the electric industry to forecast load patterns, this method has been effective for CVE.

In July 2008, CVE conducted a Load Forecast Study. This study will be used as a basis for engineering studies, financial forecasts, system planning and other special studies. This study will be reviewed periodically to update projections on systems load. **(SEE APPENDIX A FOR 2008 LOAD FORECAST STUDY)**

The contract with Xcel Energy, as a total power provider, has been very beneficial to Central Valley Electric. Scheduling for unexpected load changes due to weather conditions or variations in customer loads is unnecessary for CVE because any unforeseen additional power requirements are supplied by Xcel Energy as long as their system limitations are not exceeded.

EXISTING ENERGY RESOURCES

A good starting point when evaluating and comparing alternative supply and demand-side resources would be to review CVE's current energy sources, allocations, and pricing. As mentioned earlier, Central Valley Electric has separate purchase power contracts with Western Area Power Administration (WAPA) and Xcel Energy. These purchase power contracts, are listed below.

Western Area Power Administration:

WAPA's current contract with Central Valley Electric Co-op expires in 2024. Contract extensions will depend on receiving approval of integrated resource plans. CVE's demand and energy allotment fluctuates depending upon water flows and other restrictions.

Below are the 2008 kWh purchases from WAPA:

	<u>Energy</u>		<u>Energy</u>
January	1,172,439	July	1,405,908
February	1,067,287	August	1,358,491
March	1,194,824	September	1,176,018
April	1,259,564	October	1,130,952
May	1,473,569	November	1,094,173
June	1,336,303	December	1,204,510

Total: 14,874,038

Energy Charges: \$0.0105875 per kWh

Xcel Energy:

Xcel Energy has served CVE since its inception in 1938. Central Valley Electric currently has a contract for wholesale full requirements electric power which expires December 31, 2015, and is renewable from year-to-year thereafter until cancellation by either party, subject to a five year notice of cancellation.

All scheduling of WAPA power and additional load requirements for CVE are handled by Xcel personnel. This allows Central Valley Electric to utilize its resources more efficiently by eliminating the need for a full-time planner/power scheduler. With so many unknown variables in forecasting loads it can be financially disastrous if a utility misses a daily or hourly forecast. CVE’s demand charge is based on the actual delivery amount or 65% of the previous twelve month peak whichever is greater.

Below are the 2008 KWH purchases from Xcel Energy:

	<u>KW Billed</u>	<u>Energy</u>		<u>KW Billed</u>	<u>Energy</u>
January	86,346	63,293,439	July	109,160	73,557,091
February	89,738	60,947,707	August	108,189	73,034,040
March	95,766	68,958,934	September	99,241	58,157,387
April	100,916	69,602,513	October	93,963	66,319,663
May	107,626	71,158,568	November	87,716	62,693,600
June	115,436	75,060,767	December	88,418	63,571,306

KW Billed Total: 1,182,515
Energy Total: 806,355,015

Capacity Charges: \$5.84 per KW
Energy Charges: \$0.058012 per KWH

IDENTIFYING OTHER RESOURCE OPTIONS

Having reviewed Central Valley Electric’s current resources, the next step in the process would be to identify other resources which would either complement CVE’s current resources or replace existing purchase power contracts with other resources. This would provide continued reliability and be competitive in price. It must be understood that Central Valley Electric does have an existing contract for purchase power with Xcel Energy through December 31, 2015, and any additional resources would be expected to be implemented after fulfillment of the contract.

There are several supply-side and demand-side options to consider. Each option must be evaluated to determine cost effectiveness. Financial issues, as well as environmental issues, societal issues, and concern regarding future natural resources must be considered in planning for the future.

Conventional resources and renewable resources are currently being reviewed from both the supply-side and the demand-side perspective, keeping in mind the benefit of each to the utility and the customer. In reviewing these two types of resources, various issues which affect our society as a whole must be considered as well as determining the economics of pursuing these resources as viable and long term alternatives.

Supply-Side Options

Over the years Central Valley Electric's philosophy has been to refrain from ownership in any type of generating facility, however with CVE's wholesale power contract expiring in 2015 other resources are currently under review. With the utility industry changing so rapidly, and the concern of global warming and fossil fuel emissions, it appears wholesale purchase contracts will continue to be a preferred choice to meet current and future load requirements for CVE until such time that a clear road map from Congress and regulators has been decided. This is especially true considering the possible pressures put on power providers to compete for the lowest possible wholesale power options. The decision to extend the current contract beyond 2015 is at the discretion of both parties involved.

In the event ownership does become more cost effective over purchase contracts, Central Valley Electric would consider other alternatives. Issues to consider in shared or direct ownership would be member's rates, long term economic conditions, interest rates, social, and regulatory issues. These factors would ultimately influence the decisions regarding ownership.

Listed below are several renewable energy resources considered as future supply options. Additional resources are under evaluation by R. W. Beck. Obviously legal issues exist concerning CVE's energy options due to the full power requirements contract with Xcel Energy.

By 2015, no less than five percent of CVE's retail electric sales must include renewable energy. This will increase at a rate of one percent per year until 2020, at which time the renewable portfolio standard will be 10 percent. In 2008, 6.9 percent or 56,025,450 kilowatt hours of CVE's wholesale power, purchased from Xcel Energy, were tagged as renewable energy.

Wind Energy

Large Wind Systems:

Wind Energy has proven to be a cost-effective and an environmentally attractive source of power supply as long as a large enough plant is constructed. The wholesale cost of electricity from wind power plants has dropped below 4 cents per kilowatt-hour (kWh), according to the New Mexico Energy, Minerals and Natural Resources Department.

In 2008, New Mexico was ranked 12th in the nation in potential wind capacity according to the New Mexico Energy, Minerals and Natural Resources Department. According to the Office of Energy Efficiency and Renewable Energy, the area of New Mexico in which Central Valley Electric is located is listed as fair to good in wind resource potential. **(SEE APPENDIX B FOR NEW MEXICO WIND RESOURCE MAP)**

The American Wind and Energy Association (AWEA) stated that the national wind energy capacity grew by 50 percent in 2008, with the installation of 8,358 megawatts (MW) of new generation. The U.S. can now generate more than 25,000 MW of electricity from wind power, which is enough to power seven million American homes (National Renewable Energy Laboratory).

The AWEA adds that the new wind projects completed in 2008 accounted for about 42 percent of the entire new power producing capacity added during the year. By the end of 2008, wind power provided 1.3 percent of the total U.S. power generation according to the Energy Information Association.

Since no less than five percent of Central Valley Electric's retail electric sales must include renewable energy by 2015, wind energy will certainly be an attractive option.

Small Residential Wind Systems:

(Source: U.S. Department of Energy's; Small Wind Electric Systems: A New Mexico Consumer's Guide)

Small wind electric systems can make a significant contribution to our nation's energy needs. Although wind turbines large enough to provide a significant portion of the electricity needed by the average U.S. home generally require one acre of property or more, approximately 21 million U.S. homes are built on one-acre and larger sites, and 24 percent of the U.S. population lives in rural areas.

A small wind electric system will work if:

- There is enough wind in the area
- Tall towers are allowed in the neighborhood or rural area
- There is enough space
- It works economically

Wind energy systems are one of the most cost-effective home-based renewable energy systems. Depending on the wind resource, a small wind energy system can lower electric bills by 50 percent to 90 percent, help avoid the high cost of having utility power lines extended to remote locations, prevent power interruptions, and is nonpolluting.

The size of the wind turbine needed depends on the application of the system. Small turbines range in size from 20 watts to 100 kilowatts. The smaller or "micro" (20-500 watts) turbines are used in a variety of applications such as charging batteries for recreational vehicles or sail boats. One- to 100 kW turbines can be used in applications such as pumping water. Turbines used in residential applications can range in size from 400 watts to 100 kW (100 kW for very large loads), depending on the amount of electricity needed to generate.

A typical home uses approximately 11,040 kilowatt-hours (kWh) of electricity per year (about 920 kWh per month). Depending on the average wind speed in the area, a wind turbine rated in the range of 5 to 15 kW would be required to make a significant contribution to this demand.

Small wind turbines generate direct current (DC) electricity. Standard household appliances use alternating current (AC) electricity; therefore an inverter must be installed to convert DC electricity from the batteries to AC. Although the inverter slightly lowers the overall efficiency of the system, it allows the home to be wired for AC, a definite plus with lenders, electrical code officials, and future homebuyers.

A small turbine can cost anywhere from \$3,000 to \$35,000 installed, depending on size, application, and service agreements with the manufacturer. The American Wind Energy Association says a typical home wind system costs approximately \$32,000 (10 kW); a comparable photovoltaic solar system would cost over \$80,000.

A general rule of thumb for estimating the cost of a residential turbine is \$1,000 to \$3,000 per kilowatt. Wind energy becomes more cost effective as the size of the turbine's rotor increases. The cost of an installed residential wind energy system that comes with an 80-foot tower, batteries, and inverter,

typically ranges from \$13,000 to \$40,000 for a 3 to 10 kW wind turbine. The length of the payback period – the time before the savings resulting from the system equal the cost of the system itself – depends on the system, the wind resource at the site, electricity costs in the area, how the system is used, and available financing and incentives. Based on these factors AWEA estimates the payback could be anywhere from six to 30 years.

However, before choosing a wind system a resident should consider reducing energy consumption by making the resident or business more energy efficient. Reducing energy consumption will significantly lower utility bills and will reduce the size of the home-based renewable energy system needed.

Biomass (Municipal Solid Waste MSW)

In looking at municipal solid waste as a supply-side option, it appears the area served still does not generate sufficient MSW for the project to be feasible or cost effective.

It would be difficult to determine the real cost based on the reduced waste amount without performing detailed cost and feasibility studies. Central Valley Electric is not in a financial position to incur the cost associated with determining the economics of a project like this.

CVE has considered a Biomass project using dairy waste and agreed to commit resources to the project. However, the investment group has not followed through on the project.

Solar Energy

Solar energy is a viable alternative for heat and electricity production. The sun generates enough clean energy in one day to provide a year's supply of energy for a home or office. Producing electricity with a rooftop photovoltaic (PV) system can have several benefits, including being a buffer from volatile energy costs and shrinking the carbon footprint.

The National Renewable Energy Laboratory reports that a residential PV system will cost \$8 to \$10 per watt of power, including installation. Before rebates and tax credits, the average 2 kW system will cost between \$16,000 and \$20,000. However, as the system size increases, the cost per watt usually decreases.

There are a number of rebates, tax breaks, and other incentives that can substantially reduce the cost of installing a PV system. According to the New Mexico Energy, Minerals and Natural Resources Department, state government tax credit support is available up to \$5 million annually through 2015. The Solar Tax Credit will pay 10 percent (up to \$9,000) of a PV or solar thermal system that is operational subsequent to January 2009. On top of the state tax credit, the federal government will pay 30 percent in federal tax credits. State and federal governments frequently change the terms and amount of these tax breaks, so it is important to check the current status of any tax credit before evaluating the overall economics of installing a PV system.

Once installed, although the power electronics will likely require periodic replacement, a PV system can run virtually maintenance-free in any climate for 25 years or more.

However, before choosing a solar system a resident should consider reducing energy consumption by making the resident or business more energy efficient. Reducing energy consumption will significantly lower utility bills and will reduce the size of the home-based renewable energy system needed.

Demand-side Options

Demand-side management (DSM) programs are designed to reduce the demand for power or to shave high demand peaks. Many utilities in need of additional capacity and energy consider DSM programs as an alternative to increased generation, because these programs are more cost effective than new generation. Less generation will result in fewer air pollutants and will help preserve natural resources for future generations. Obviously, less consumption also means fewer revenues for utilities which could possibly influence rate structures.

Central Valley Electric is dependent on power sales to maintain financial stability and to continue to provide low cost power to its consumers. CVE is a not-for-profit, consumer owned cooperative; therefore, it is faced with the difficult decision of considering DSM programs that are cost effective while having to deal with the issue of lower revenues. Raising rates is one way to compensate for the lost revenue but that does not always benefit the majority.

Central Valley Electric currently has two programs in place which are considered to be Demand Side Management Programs. These programs are fairly new programs and the co-op will continue to evaluate their benefits to the co-op and its members. The programs in place consist of:

Marathon Water Heater Energy Efficiency Program

Water heating is the third largest energy consumer in the home. Using hot water efficiently enables members to save energy and money. By selling Marathon Water Heaters, CVE is encouraging members to install energy efficient electric water heaters.

Marathon Water Heaters are 94 percent efficient, with the strongest tank in the residential water heater industry. The tanks have a lifetime warranty, and won't rust or corrode. The tank design is a seamless blow-molded polybutene inner tank wrapped in 2.5 inches of filament-wound fiberglass. These water heaters are great for brutal well water conditions. Marathon water heaters have no stand-by heat loss.

In April 2009, CVE began collecting a Renewable Energy and Energy Conservation fee. New Mexico Public Regulation Commission Rule 572 gives co-ops the ability to recover some costs from the state. Currently, CVE pays one-half percent of its operating revenue to the Commission for inspection and supervision fees. In accordance with Rule 572, CVE can recover that fee by collecting one percent of additional revenue from its members. The funds collected from the state and CVE members must be used for renewable energy and energy efficiency programs that benefit CVE members.

Because this fund is available to use on energy efficiency programs and to encourage member to install energy efficient water heaters, CVE is offering its members a 60 percent discount off the co-ops purchase price of a Marathon Water Heater.

Below is a price list of Marathon Water Heaters:

Gallon Capacity:	Co-op Price:	Member Price:
15	\$420.00	\$168.00
20	\$446.25	\$178.50
30	\$645.75	\$258.30
40	\$666.75	\$266.70
50	\$703.50	\$281.40
75	\$840.00	\$336.00
85	\$876.75	\$350.70
105	\$960.75	\$384.30

A CVE representative verifies the Energy Factor of the old water heater being replaced to better evaluate the energy savings to the member and the co-op.

In September, 2009, CVE began advertising and selling Marathon Water Heaters, and as of November 23, 2009, the co-op has sold 14 energy efficient Marathon Water Heaters. By replacing these old water heaters with new energy efficient Marathons, the co-op will save an estimated 16,602.02 kWh or \$963.13 (based on current wholesale rate of \$0.058012 per kWh) a year. That number will continue to increase as the number of water heater sales increases.

Compact Fluorescent Light Bulb Energy Efficiency Program

According to the U.S. Department of Energy, artificial lighting consumes almost 15 percent of a household's electricity use. The use of new lighting technologies can reduce lighting energy use in homes by 50 percent to 75 percent. ENERGY STAR® qualified compact florescent light (CFL) bulbs use about 75 percent less energy than standard incandescent bulbs and last up to 10 times longer. A single CFL bulb saves about \$30 or more in electricity costs over the lifetime of the bulb. Modern compact fluorescent bulbs typically have a lifespan of between 6,000 to 10,000 hours. They produce about 75 percent less heat, so they are safer to operate and can cut energy costs associated with home cooling.

Through this program, CVE hopes to furnish each residential member with two (2) 23-watt CFL bulbs (100-watt equivalent). As of November 23, 2009, CVE has distributed 2,586 bulbs. According to the Department of Energy, one 23-watt CFL bulb will save 112 kWhs a year in energy (based on the bulb being used 4 hours per day). That is a savings of 289,632 kWhs or \$16,802.13 (based on the current wholesale rate of \$0.058012 per kWh) a year for the co-op.

Bulbs have been distributed at CVE's annual meeting and to members coming to the co-op office. Other distribution methods are being considered to get more CFL bulbs distributed to members who have not yet received their two free bulbs.

Interruptible Rate Program- The objective of this program is to provide a credit for consumers who have a target interruptible demand of at least 500 KW and sign a contract agreeing to be interrupted to help curtail load during peak operating times.

Four perspectives to consider when determining DSM programs:

Participant's Perspective

The cost would be the initial capital cost, ongoing operation and maintenance, and any removal cost for old equipment. The benefits are lower utility bills and rebates from utilities, if any.

Ratepayer Perspective

This affects those who do not participate in the program. They are affected if electric rates increase due to DSM programs, or would experience a slight reduction in allocated patronage capital margins for the year as the DSM programs increase expenses. The costs are revenue losses from the programs, utility cost for operating the program, and rebates paid, if any. The benefit to ratepayers comes from the reduction in capacity and energy purchases.

Utility Perspective

This deals with the financial impact on the utility. The costs are program cost, rebates, if any, and any additional supply cost. Lost revenue is not considered because it will be made up through higher rates. Benefits are avoided capacity and energy cost.

Total Resource Cost Perspective

This looks at the overall cost and benefit to society. The environmental effects of generation are estimated to be a 10 percent external factor which is added to the cost of generation. The costs are the program cost, participant's cost, and supply cost, if any. The benefits are reduced capacity and energy cost, plus the 10 percent external factor for the environmental effects of generation.

The goal is to have all perspectives benefit from DSM programs, although in many cases, the ratepayer perspective does not benefit because not everyone participates in the program. Non-participants are affected negatively with rate increases to help cover lost revenues and reduced capital credits allocated. In reviewing the various DSM options, Central Valley Electric wanted to identify programs that had a short pay-back period and would benefit customers. There are engineering estimates, manufacture's data, technical data from utilities, and other general assumptions which are used to help filter through DSM programs.

CVE evaluated two residential programs and one commercial program. The programs evaluated were:

1. Energy Efficiency Kit and Workshop
2. Energy Efficiency Loan Program
3. Power Boss Motor Controller Energy Efficiency Program

PROGRAM ASSUMPTIONS

The following results are based upon estimates and assumptions, and information from the United States Department of Energy, ENERGY STAR® and the Environmental Protection Agency.

PROPOSED RESIDENTIAL PROGRAMS

Listed below are the technologies and figures associated with the individual residential programs.

Energy Efficiency Kit and Workshop

With energy cost on the rise, the need for energy efficiency programs is important to both the co-op and its members. An efficient home uses less energy and makes better use of the energy it does pull. Informing members about techniques that can help reduce their usage and provide them with some of the necessary tools to do so could make a substantial impact on member's energy bills.

Making a home efficient should be the first step in the process of reducing energy use. Educating members on energy efficiency techniques and supplying them with a starter kit can help the member start to save energy and money.

CVE proposes to host a workshop on energy efficiency, with training on proper use of simple weatherization products, i.e. how to caulk a window, how to apply weather stripping, how to use a programmable thermostat. Members who attend the workshop will be given an Energy Efficiency Starter Kit. The kit will contain one 5.5 ounce of caulk, a programmable thermostat, a package of 14 foam outlet and switch covers, 17 feet of poly foam weather stripping, a Smart Strip surge protector, and a furnace whistle.

Members might be more apt to make energy efficient improvements to their homes if they are armed with both the knowledge from the workshop and the tools from the starter kit.

Estimated annual energy savings for items in Energy Efficiency Starter Kit:

Programmable Thermostat

- Estimated Annual kWh Savings 2,127.70
- Estimated Annual Energy Savings for member* \$175.50
- Estimated Annual Energy Savings for co-op** \$123.43

Smart Strip Surge Protector

- Estimated Annual kWh Savings 638.30
- Estimated Annual Energy Savings for member* \$52.65
- Estimated Annual Energy Savings for co-op** \$37.03

Furnace Whistle

- Estimated Annual kWh Savings 329.80
- Estimated Annual Energy Savings for member* \$27.20
- Estimated Annual Energy Savings for co-op** \$19.13

Foam Outlet & Switch Covers (package of 14)

- Estimated Annual kWh Savings 138.30
- Estimated Annual Energy Savings for member* \$11.41
- Estimated Annual Energy Savings for co-op** \$8.02

Tube of Caulk (5.5 oz)

- Estimated Annual kWh Savings 86.30
- Estimated Annual Energy Savings for member* \$7.12
- Estimated Annual Energy Savings for co-op** \$5.01

Poly Foam Weather Stripping (17 ft)

- Estimated Annual kWh Savings 46.10
- Estimated Annual Energy Savings for member* \$3.80
- Estimated Annual Energy Savings for co-op** \$2.67

*Based on the current residential rate of \$0.082484 per kWh

**Based on the current wholesale rate of \$0.058012 per kWh

If all items in the starter kit are properly installed in a member's home, they could save an estimated \$277.68 a year in energy costs, and the co-op could save an estimated \$195.29 a year in wholesale power costs.

CVE has spoken with representatives from the Southwest Energy Efficiency Project (SWEET) and the New Mexico Eastern Regional Housing Authority to help provide knowledgeable speakers to help conduct the workshop.

Currently CVE has put information in its quarterly newsletter and on its Web site about the energy efficiency workshop and kit to see how many members might be interested. So far there are about 12 members interested. The co-op will continue to advertise this program and get more interest before a workshop date is set.

Energy Efficiency Loan Program

In an effort to make Central Valley Electric Cooperative members' homes and businesses more energy efficient the cooperative evaluated the implementation of a direct loan program. A member could borrow up to \$15,000 at three percent interest for up to 10 years.

These loans can be provided to finance the cost of materials and labor for the following:

- **Weatherization:** Stopping air leaks by weather-stripping and caulking around doors and windows, and insulating vulnerable areas to stop air leaks.
- **Insulation:** Adding insulation to attics, walls, floors, basements and/or crawlspaces to potentially reduce heating and cooling needs by 30 percent.
- **Heat Pumps or Dual Fuel Heat Pumps:** Heating and cooling costs can account for nearly half of a home's energy bill. ENERGY STAR qualified heat pumps have a higher seasonal efficiency rating (SEER) and heating seasonal performance factor (HSPF) than standard models (13 SEER is industry standard), which makes them about eight percent more efficient than standard new models and 20 percent more efficient than what a member might currently have in their home. CVE would require members to install a unit that is 14 SEER or greater and ENERGY STAR rated. Before a member invests in a new HVAC system, they need to address big air leaks in

their homes and the duct system. Sometimes, these are the real sources of problems rather than the HVAC equipment.

- **Geothermal Heat Pumps:** Geothermal heat pumps are similar to ordinary heat pumps, but use the ground instead of outside air to provide heating, air conditioning and, in most cases, hot water. Because they use the earth's natural heat, they are among the most efficient and comfortable heating and cooling technologies currently available. ENERGY STAR qualified geothermal heat pumps use about 30 percent less energy than a standard heat pump, and are quieter than conventional systems. Qualifying geothermal heat pumps have to be ENERGY STAR rated.
- **Window Replacement:** Replacing old inefficient windows with new ENERGY STAR windows can help reduce energy bills by up to 15 percent. In addition, ENERGY STAR qualified windows do more than just lower energy bills – they deliver more comfort, create less condensation, and protect valuables from sun damage better than conventional clear-glass double-paned alternatives. Estimated savings vary from region to region depending on current heating and cooling costs and are generally greatest where there are hot summers, cold winters or both. Southeastern New Mexico is in the South/Central Climate Zone which requires both heating and cooling.

Windows that are ENERGY STAR qualified in the South/Central Climate Zone must have National Fenestration Rating Council (NFRC is a non-profit organization that administers the only uniform, independent rating and labeling system for the energy performance of windows, doors, skylights, and attachment products.) certified performance ratings of:

U-Factor: 0.40 or less. U-Factor measures how well a product prevents heat from escaping. The rate of heat loss is indicated in terms of the U-Factor (U-Value) of a window assembly. U-Factor ratings generally fall between 0.20 and 1.20. *The lower the U-Factor, the greater a window's resistance to heat flow and the better its insulating value.*

Solar Heat Gain Coefficient: 0.40 or less. SHGC measures how well a product blocks heat caused by sunlight. The SHGC is the fraction of incident solar radiation admitted through a window (both directly transmitted and absorbed) and subsequently released inward. SHGC is expressed as a number between 0 and 1. *The lower a window's solar heat gain coefficient, the less solar heat it transmits in the house.*

Windows that are ENERGY STAR qualified in the South/Central Climate Zone generally have the following characteristics:

Low E-Glass: Special coatings reflect infrared light, keeping heat inside in winter and outside in summer. They also reflect damaging ultraviolet light, which helps protect interior furnishings from fading.

Wood, Vinyl, Fiberglass or Composite Frame Material: Wood composites, vinyl, and fiberglass frames reduce heat transfer and help insulate better.

Gas fills of Argon, Krypton or other inert gas: Some energy-efficient windows have argon, krypton, or other gases between the panes. These odorless, colorless, non-toxic gases insulate better than regular air.

Other factors to consider when choosing a replacement window are:

Visible Transmittance: VT measures how much light comes through a product. The visible transmittance is an optical property that indicates the amount of visible light transmitted. VT is expressed as a number between 0 and 1. *The higher the VT level, the more light is transmitted.*

Air Leakage: AL is indicated by an air leakage rating expressed as the equivalent cubic feet of air passing through a square foot of window area. Heat loss and gain occur by infiltration through cracks in the window assembly. *The lower the AL, the less air will pass through cracks in the window assembly.*

Condensation Resistance: CR measures the ability of a product to resist the formation of condensation on the interior surface of that product. *The higher the CR rating, the better that product is at resisting condensation formation.* While this rating cannot predict condensation, it can provide a credible method of comparing the potential of various products for condensation formation. CR is expressed as a number between 0 and 100, and this rating is optional and manufacturers can choose not to include it.

Loan Program Guidelines

- Loans can only be made to the owner of the property.
- Loans can be made for the cost of materials.
- Loans can be made for the cost of labor to install the energy efficiency measures if installed by a licensed contractor.
- If the member installs the materials, the loan will be limited to the cost of the materials only.
- Loans can be made for existing structures only and not for new construction.
- Loans can include commercial and industrial buildings if owned and operated by the member.
- Loans will only be made to members who have a good payment history with the cooperative and a good credit report (a credit check will be ran on the member).
- Loans of less than \$3,000 will be evaluated and processed by CVE staff to determine credit reliability. Credit reliability will determine acceptance or rejection of those loans.
- Loans in excess of \$3,000 will require the approval of the board of trustees at their regular monthly meeting.
- A member has 120 days from the date on the loan payment check to complete the project. If the project is not complete within that time frame the interest rate increases to 20 percent.
- An inspection, by a co-op representative, upon completion of the work performed will be required. Repayment of the loan will start after the inspection.
- CVE will issue check payable to both the member and the contractor/supplier for materials and/or labor, except when proof of purchase or paid invoices are presented. In which case, the check will be made payable to the member.
- CVE reserves the right to bill the monthly loan repayments on the member's monthly electric bill.
- A mortgage on the property or equivalent security will be required on each loan.
- A \$50 charge for the cost of the credit check, filing fees, and other charges necessary for initiating the loan will be added to the approved loan amount.
- No work is to be started or purchases made before loan approval by the cooperative staff or board is made.

Action Taken: At the July 22, 2009, board meeting, the board of trustees voted not to implement an Energy Efficiency Loan Program for co-op members.

Power Boss Motor Control Energy Efficiency Program

In 2008, CVE hired Power Engineers to conduct an energy efficiency study for the co-ops oils and gas members. Oil and gas makes up over 70 percent of CVE's load and this study helped the co-op evaluate potential energy efficiency programs for this sector. The energy efficiency study provided the co-op with several different technologies that could help oil and gas members save money on their electric bill.

The technology that CVE was most interested in testing was the Power Boss motor controller. According to Power Engineers, the automatic motor controller continuously monitors load so that voltage can be adjusted to improve power factors and efficiency during light loading without stalling during heavy loading. The device also provides soft starting capabilities which reduces motor inrush.

CVE's board of trustees voted to launch a pilot program using the Power Boss. Five oil companies volunteered to test the device on several of their oil wells to see if the motor controllers do in fact help the wells be more energy efficient. The oil companies agreed to split the cost of the devices with the co-op. The devices were installed on 14 oil wells in late September 2009. CVE plans to monitor the devices and the energy consumption on the select wells for about six to eight months. After that time CVE will evaluate all data collected and either move forward with an energy efficiency program or evaluate another technology that could potentially help oil companies save energy.

ENERGY EFFICIENCY OBJECTIVES

Not unlike the tremendous technological strides on the computer, electronics, and other fronts, energy efficiency takes advantage of advances in technology to provide significantly better, smarter services.

Energy Efficiency Means:

- Using advanced and state-of-the-art technologies to provide better quality energy services with less energy.
- Getting the most productivity from every unit of energy.
- Getting the desired energy services – comfortable homes, profitable businesses, convenient transportation – with less energy use, less air pollution, and lower total cost.
- Using energy wisely.
- Eliminating energy waste.
- Using technology to easily reduce energy use without having to daily “remember” to do it yourself.

Energy efficiency is a valuable resource that creates a win-win solution on multiple fronts. One action equals five major consumer and societal benefits. It saves consumers money, increases comfort, protects the environment, enhances the economy, and promotes national security.

When energy efficiency is combined with smart energy practices – like turning off lights, TVs, computers, and electronics that are not in use – all of the benefits above are compounded.

Energy Efficiency Goals

The following are energy efficiency goals set for 2009 and how the co-op has worked or are working to meet those goals:

- Central Valley Electric Cooperative will continue to educate our members on the many advances in energy efficiency through personal conversations, newsletters, brochures, the *Enchantment* back page and Web site. Through these energy efficiency programs, CVE hopes to get the members thinking about ways in which they can help reduce their energy usage, while at the same time reducing their energy bill.
 - In 2009, CVE published numerous articles on energy efficiency such as CFLs, weatherization, and water heaters. Educating members on energy efficiency continues to be a major goal of Central Valley Electric Cooperative.
- Purchase an Infrared camera in 2009 for \$14,000. This camera can be used in member's home to detect where heating and cooling is entering and exiting a resident.
 - An infrared camera was purchased in February 2009.
- To conduct energy efficiency study for CVE's oil and gas members. This group makes up about 80 percent of CVE's load. This study will help CVE determine the appropriate energy efficiency programs that need to be implemented.
 - This study was completed and the results presented to the co-op in June 2009. An energy efficiency program is currently being evaluated based on the results and suggestions of this study.
- Help low income member's reduce their energy use. CVE would like to replace 100 percent of the incandescent light bulbs with CFL bulbs in 25 percent of the member's homes that qualified for the Low Income Home Energy Assistance Program (LIHEAP). In 2007 CVE had about 134 members qualify for LIHEAP, and as of December 15, 2008, CVE had about 135 members qualify for LIHEAP (25 percent would be 33.75 members).
 - As of November 23, 2009, CVE has successfully switched out light bulbs in 27 members homes. We also have four other members that have expressed an interest in the program and we are working on getting a time scheduled to switch-out their bulbs.
 - Currently we have switched-out 706 light bulbs. According to the Department of Energy, one 23-watt CFL bulb will save 112 kWhs a year in energy (based on the bulb being used 4 hours per day). By switching out 706 light bulbs, CVE has the potential to save 79,072 kWhs or \$4,587.12 a year in wholesale energy purchases.
- To implement a CFL Program (as described above).
 - In January 2009, CVE implemented a CFL Energy Efficiency Policy where the co-op provides two CFL bulbs to each residential member.
- To revise the existing Water Heater Energy Efficiency Program (as described above).
 - In August 2009, CVE began selling energy efficient Marathon water heaters.

The following are energy efficiency goals for Central Valley Electric Cooperative for the year 2010:

- Central Valley Electric Cooperative will continue to educate our members on the many advances in energy efficiency through personal conversations, newsletters, brochures, the *Enchantment* back page and Web site. Through these energy efficiency programs, CVE hopes to get the

members thinking about ways in which they can help reduce their energy usage, while at the same time reducing their energy bill.

- CVE will continue to evaluate the Power Boss pilot project to see if these devices are going to help oil and gas members save energy.
- CVE will evaluate potential energy efficiency programs that can be implemented for agriculture irrigation members.
- CVE will evaluate potential renewable energy programs for members.

LEAST-COST OPTIONS

The purpose of DSM programs was to help utilities lower loads because of the lack of available capacity and energy, avoid the high cost of new generation, and to help preserve natural resources.

DSM programs may be used as a way to save energy. Whatever happens in the industry and as a player in the market, Central Valley needs to consider what is best for the utility and its member's. The DSM programs listed above do have a positive benefit to cost factor, but are customers willing to spend the extra money to purchase the more efficient equipment if the utility does not provide rebates?

IRP ACTION PLAN

Traditionally, utilities have relied upon 20 year planning horizons in their decision making process. The days of long-term power planning are over and utilities are faced with a new set of rules that have not been completely outlined. With this uncertainty, power planning and utility decision making for the future are very difficult due to all utilities treading into unknown waters. Over the past several years climate change, greenhouse emissions and global warming have become topics of increasing interest in Congress and the utility industry. In an effort to address global warming issues, Congress could impose limits on the emissions of carbon dioxide by electric utilities. These limits could make it economically unfeasible to build new coal-fired electric plants which are needed to meet the increasing demand for electricity.

As a means of minimizing the uncertainty utilities are facing, integrated resource planning has been introduced to help utilities recognize their strengths and weaknesses more clearly in an era of unprecedented change. Understanding where the utility is positioned in terms of current and future resources, the price of those resources, and the reliability of those resources will help the utility prepare itself to meet future load requirements in an economically and environmentally safe manner.

Having an action plan as a roadmap will help Central Valley Electric meet the needs of its customers. With all the anticipated changes in the industry, Central Valley is submitting a two-year and a five-year plan as its plans for the future. These plans are intended to test the residential and commercial markets with technologies that will save customers money over time.

Two -Year Plan

The two-year plan will consist of the following goals and objectives:

Central Valley Electric will continue to rely upon existing purchase power contracts to meet current and future power needs. This decision is based upon the following reasons:

1. The Xcel Energy contract, when compared to other resources, was well below in cost per kWh.
2. Power reliability has been good with Xcel Energy, as well as their handling of Central Valley's scheduling and power needs.
 - This allows Central Valley to forego having a full-time forecaster and planner/scheduler for daily and hourly power requirements.

The State of New Mexico is currently drafting rules to address energy efficiency. Central Valley Electric Cooperative is currently researching ways in which we can incorporate more energy efficiency programs.

CVE will evaluate the findings of the energy efficiency study being conducted for oil and gas members to determine if implementing new programs will be beneficial to the cooperative.

Five-Year Plan

Preparing a five-year plan is done with much conservatism. Several different load forecasts have been prepared based on different growth scenarios.

1. These forecasts would need to be updated and reviewed.
2. Assuming no dramatic changes occur during the next five years, Central Valley Electric would want to review current supply-side options and compare them to existing contracts.
3. In the event customer and utility needs change during this period, existing programs would need to be re-evaluated to determine if they are achieving the desired results. If not, then other customer programs would need to be evaluated.
4. CVE will have better direction on the outcome of any long term wholesale power contract extension during the five-period and will need to make appropriate decisions to meet the needs of members in the future.

VALIDATION AND EVALUATION

Current projects such as the electric heating program and the electric water heating program require different methods to validate present consumption versus projected savings. The electric water heater program will require gathering information on the water heater they are replacing, reviewing the customers' monthly utility bills and determining what portion is for water heater consumption and what portion is for miscellaneous usage. Performing an energy audit of the customers' residence will help to differentiate the differences. Many assumptions will still have to be made regarding the energy usage of various electric devices and consideration for the length of time items are on. Predicting the savings will be based upon manufacturer data estimates and comparing it to previous usage patterns.

ENVIRONMENTAL EFFECTS

Currently, Central Valley Electric Co-op has one resource for its power supply. It would be reasonable to assume that Central Valley's power purchase from Xcel Energy would come from fossil fuels and would, therefore, be considered unfriendly to the environment. Xcel Energy has been very aggressive in resource acquisitions of traditional fossil fuels, renewable and alternative generation sources. Because of the vast amount of resources which Xcel Energy possesses, it is difficult to determine from which generation source Central Valley's power needs are being met.

In an effort to comply with Western's requirements to minimize adverse environmental effects, Xcel Energy located in Amarillo, Texas, was contacted about Xcel's efforts regarding air quality and environmental issues. Their response follows:

Southwestern Public Service Company is undertaking many initiatives to prepare for future climate change regulation and to reduce greenhouse gas emissions from our operations. One way we plan to cut emissions is increasing our renewable energy offerings. Xcel Energy, Southwestern Public Service Company's holding company is already the No. 1 wind energy provider in the nation, and continues to add significant renewable energy additions. Southwestern Public Service Company purchases 600 MW of renewable resources, mainly powered by wind energy located in Texas and New Mexico. Southwestern Public Service Company is continuing to pursue activities, including energy efficiency programs to reduce our environmental impact.

GOVERNING BODY APPROVAL AND PUBLIC PARTICIPATION

Central Valley Electric Co-op scheduled and published a date in the Artesia Daily Press and the Roswell Daily Record for a public hearing regarding the integrated resource plan. **(SEE APPENDIX C FOR AFFIDAVIT OF PUBLICATION)** Copies of the document were made available to the public.

There was no public input. CVE's general manager and executive vice president, Mr. Chuck Pinson, approved the integrated resource plan.

Dated on this the _____ day of December, 2009

Chuck Pinson, General Manager
Central Valley Electric Cooperative, Inc.

APPENDIX A

2008 Load Forecast Study

APPENDIX B

New Mexico Wind Resource Map

New Mexico - Wind Resource at 50 m

