



Central Valley Electric Cooperative, Inc.

A Touchstone Energy® Cooperative 

2013 INTEGRATED RESOURCE PLAN

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2013 Integrated Resource Plan
Table of Contents

	Page
UTILITY BACKGROUND	2
UTILITY PROFILE DATA (2012).....	2
LOAD FORECASTING INFORMATION	3
EXISTING ENERGY RESOURCES	3
WESTERN AREA POWER ADMINISTRATION (WAPA).....	3
SOUTHWESTERN PUBLIC SERVICE (SPS) ENERGY.....	4
WESTERN FARMERS ELECTRIC COOPERATIVE (WFEC).....	5
IDENTIFYING OTHER RESOURCE OPTIONS.....	5
SUPPLY-SIDE OPTIONS	5
<i>Wind Energy</i>	<i>6</i>
<i>Solar Energy</i>	<i>7</i>
<i>Bio Mass</i>	<i>8</i>
<i>Geothermal</i>	<i>8</i>
<i>Demand-side Options.....</i>	<i>8</i>
<i>Marathon Water Heater Energy Efficiency Program.....</i>	<i>9</i>
<i>Commercial & Industrial Lighting Rebate Program.....</i>	<i>10</i>
<i>Home Energy Audit Program.....</i>	<i>10</i>
<i>Heating & Air Conditioning Rebate Program.....</i>	<i>11</i>
<i>Interruptible Rate Program</i>	<i>13</i>
<i>Participant's Perspective</i>	<i>13</i>
<i>Ratepayer Perspective.....</i>	<i>13</i>
<i>Utility Perspective.....</i>	<i>13</i>
<i>Total Resource Cost Perspective</i>	<i>13</i>
ENERGY EFFICIENCY OBJECTIVES & GOALS	14
LEAST-COST OPTIONS	15
IRP ACTION PLAN.....	16
<i>TWO YEAR PLAN</i>	<i>17</i>
<i>FIVE YEAR PLAN.....</i>	<i>17</i>
VALIDATION AND EVALUATION.....	17
ENVIRONMENTAL EFFECTS	17

UTILITY BACKGROUND

Central Valley Electric Cooperative, Inc. (CVEC) is a consumer owned, RUS utility serving over 14,000 meters. Central Valley Electric serves members in Eddy, Chaves, and portions of Lea and Otero counties in southeastern New Mexico. CVEC derives its current power needs from purchase contracts provided by Southwestern Public Service Company (SPS), Western Area Power Administration (WAPA), and on June 1, 2012, CVEC started taking a portion of its power from Western Farmers Electric Cooperative (WFEC).

CVEC's peak demand for 2012 was over 117.5 megawatts (MW), with energy sales over 752 million kilowatt hours (kWh). The historical growth rate for CVEC the past 3 years has been an estimated average of 3.32 percent for capacity and an estimated average of 5.10 percent for energy. These increases have been a result of increased activity in the oil and gas industry.

With the utility industry changing as rapidly as it has in the past couple of years, namely the creation of the Southwest Power Pool (SPP) and the desire by the Federal Energy Regulatory Commission to create regional energy markets, it has been difficult to make specific long term plans because of the uncertainty in the industry. Since CVEC first energized its lines in October 1938, the co-op has purchased all of its wholesale power from SPS. However, in recent years SPS has made it clear that they will no longer continue to serve CVEC as a long-term wholesale power customer. CVEC and SPS have entered into a Replacement Power Sales Agreement (RPSA) that will allow CVEC to incrementally reduce wholesale power purchases over an extended period. This reduction in wholesale power will be done in four different phases as discussed further below. In an effort to secure future wholesale power, CVEC has become a member of Western Farmers Electric Cooperative (WFEC), a generation and transmission cooperative headquartered in Anadarko, Oklahoma.

2012 UTILITY PROFILE DATA

System Peak:	117,531 KW	Date:	August 2012
Energy Sales:	752,881,064		
Annual Load Factor:	78.12%		

Generation and Purchases:

A. Contract Energy Purchases	
1. Southwestern Public Service	829,067,817
2. Western Area Power Administration	14,342,168
3. Western Farmers Electric Cooperative	106,010,842
B. Total Purchases (without losses)	804,350,532
C. System Losses	75,702,364
D. System Losses in Percent	6.34%
E. Total Energy to Customers	752,881,064

NOTE: SPS wholesale rate charges losses for deliveries from generation bus to delivery points.

Number of Customers & Energy Delivered By Customer Class:

<u>Customer Class:</u>	<u># of Customers:</u>	<u>kWhs:</u>
Residential	5,201	69,221,455
Commercial	925	17,777,117
Irrigation	710	70,503,483
Industrial	3,016	528,061,504
Oil Wells	4,579	66,700,093
Office		484,689
TOTALS	14,431	752,748,341

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 CVEC.

In 2012, CVEC, in conjunction with WFEC, updated its Load Forecast. This forecast will be used as a basis for engineering studies, financial forecasts, system planning and other special studies. This forecast is reviewed annually to update projections on systems load. The forecast is provided to WFEC, SPP and SPS for planning purposes

The contract with SPS, as a total power provider, has historically been beneficial to Central Valley Electric. Scheduling for unexpected load changes due to weather conditions or variations in customer loads is unnecessary for CVEC because any unforeseen additional power requirements are supplied by SPS as the regional balancing authority and by virtue of a transmission agent agreement, as long as 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 CVEC's current energy sources, allocations, and pricing. As mentioned earlier, Central Valley Electric has separate purchase power contracts with Western Area Power Administration, SPS and WFEC. 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. CVEC's demand and energy allotment fluctuates depending upon water flows and other restrictions.

Below are the 2012 energy purchases from WAPA:

	<u>Energy</u>		<u>Energy</u>
January	1,637,981	July	1,174,627
February	1,088,810	August	1,252,016
March	1,218,919	September	1,002,506
April	1,284,964	October	1,130,952
May	1,166,965	November	1,130,952
June	1,085,745	December	1,167,731

Total: 14,342,168

Energy Charges: \$0.01219 per kWh

Southwestern Public Service:

SPS has served CVEC for 75 years. However, SPS will not renew the co-ops purchase power agreement. In response to this decision by SPS, the co-op has acquired all necessary regulatory approvals to join WFEC. CVEC will continue to own and maintain its transmission and distribution system, just as it does now, and the immediate, short-term and load following power requirements will continue to be provided by SPS through the summer of 2022. However, CVEC and SPS have agreed to incrementally step out of wholesale power purchases over an extended period of time. The incremental step out of wholesale power purchases are as follows:

- June 1, 2012, CVEC took 29 MW off the SPS generation system
- By 2017, CVEC has to take an additional 22 MW off the SPS generation system
- By 2022, SPS will only provide CVEC a total of approximately 45 MW
- By 2024, SPS will only provide CVEC a total of approximately 30 MW
- By the end of 2026, CVEC will receive all of its wholesale power from WFEC

Western Farmers Electric Cooperative began providing wholesale power to CVEC in June 2012. The SPS RPSA does allow for CVEC to reduce up to 5 percent of the Phase I and Phase II capacity reductions by demand side resource programs and an additional 5 percent through renewable energy programs.

All scheduling of WAPA power and additional load requirements for CVEC are currently handled by SPS 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. CVEC's demand charge is based on the actual delivery amount or 65 percent of the previous twelve month peak whichever is greater.

Below are the 2012 energy purchases from SPS:

	<u>KW Billed</u>	<u>Energy</u>		<u>KW Billed</u>	<u>Energy</u>
January	91,322	65,159,362	July	86,120	58,388,755
February	95,530	62,609,964	August	88,531	59,130,326
March	107,046	70,876,346	September	94,183	54,900,356
April	107,221	69,336,198	October	80,131	53,682,946
May	108,547	66,931,416	November	71,072	51,203,509
June	78,925	55,975,779	December	77,445	54,862,018

KW Billed Total: 1,238,263
Energy Total: 829,067,817

Capacity Charges: \$6.40 to \$6.60 per KW

Western Farmers Electric Cooperative (WFEC):

On June 1, 2012, CVEC had to take 29 MW off the SPS system. A purchased power agreement (PPA) with WFEC was negotiated to provide for CVEC’s first incremental load reduction of wholesale power from SPS.

Below are the 2012 energy purchases from WFEC:

	<u>KW Billed</u>	<u>Energy</u>		<u>KW Billed</u>	<u>Energy</u>
January			July	29,000	18,264,000
February			August	29,000	17,640,000
March			September	19,000	13,976,800
April			October	18,000	13,368,271
May			November	20,000	13,116,571
June	29,000	16,344,000	December	17,000	13,301,200

KW Billed Total: 164,000
 Energy Total: 106,010,842

Capacity Charges: \$7.50 per KW

IDENTIFYING OTHER RESOURCE OPTIONS

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 CVEC’s new Replacement Power Sales Agreement, CVEC did

conduct an economic analysis of the available options to meet the long term wholesale power needs. The economic analysis performed by EnerVision of Atlanta, Georgia, indicated a purchase power agreement was more favorable than constructing a generation resource, given that CVEC has become a member of WFEC. WFEC will be constructing generation resources to serve CVEC's loads and CVEC will have equity ownership in the generation resources constructed. With the utility industry changing so rapidly, and the concern of global warming and fossil fuel emissions, it appears CVEC's decision to become a member of WFEC was a good decision given no clear road map from Congress and regulators has been decided. This is especially true considering the generation resources to be constructed by WFEC to serve CVEC's loads are envisioned to be high efficiency combined cycle natural gas plants that emit less carbon than traditional pulverized coal plants.

WFEC will conduct all power plant evaluations on behalf of CVEC. Issues to consider in power plant construction would be member's rates, long term economic conditions, availability of capital and the associated interest rates, social, and regulatory issues. These factors would ultimately influence the decisions regarding WFEC ownership.

Pursuant to a state mandated Renewable Portfolio Standard, by 2015, no less than five percent of CVEC'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 2012, 5.91 percent of CVEC's wholesale power, purchased from SPS, was 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. Currently, New Mexico has 750 MW of total wind capacity online, and is ranked 17th in the United States (American Wind Energy Association). As for wind resources, New Mexico is ranked 10th in the U.S.

According to a resource assessment from the National Renewable Energy Lab (NREL), New Mexico's wind resources could provide nearly 75 times the state's current electricity needs. **Most of the commercial-scale turbines installed today are 2 MW in size and cost roughly \$3.5 Million installed.**

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: American Wind Energy Association and Department of Energy)

If you have enough wind resource in your area and the situation is right, small wind electric 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 are nonpolluting.

On average a typical American home would require a small turbine with a 10-kilowatt generating capacity to meet all its electricity needs. The exact size needed to power a home, however, can range from 2 kW to 10 kW based on a home's energy use, average wind speeds, and the turbine's height above

ground (which affects its productivity). Wind turbines under 100 kilowatts cost roughly \$3,000 to \$5,000 per kilowatt of capacity. That means a 10 kilowatt machine (the size needed to power an average home) might cost \$35,000-\$50,000.

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.

Solar Energy

(Source: Department of Energy and National Renewable Energy Laboratory)

A small solar electric or photovoltaic (PV) system can be a reliable and pollution-free producer of electricity for your home or office. Small PV systems also provide a cost-effective power supply in locations where it is expensive or impossible to send electricity through conventional power lines.

Because PV technologies use both direct and scattered sunlight to create electricity, the solar resource across the United States is ample for home solar electric systems. However, the amount of power generated by a solar system at a particular site depends on how much of the sun's energy reaches it. Thus, PV systems, like all solar technologies, function most efficiently in the southwestern United States, which receives the greatest amount of solar energy.

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 through 2015. The Solar Tax Credit will pay 10 percent (up to \$9,000) of a PV or solar thermal system. On top of the state tax credit, the federal government will pay 30 percent in federal tax credits through December 31, 2016. 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.

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.

CVEC members can take advantage of a Photovoltaic (PV) Water Pumping rate, and members can use the sun to pump water for livestock wells or other small needs. In order for the location of the watering system to qualify for this rate, the system must be located at least one-half mile from existing lines. Currently, there are six of these small PV systems in CVEC's service area. Four of the systems are three kilo-watts (KW) and two of the systems are four KW.

CVEC members who don't wish to install renewable energy on their property can still purchase renewable energy. CVEC members can purchase renewable energy in 100 kWh blocks for \$2.25, or a member can elect to have 100 percent of their electricity come from renewable sources for an additional \$0.0225 per kWh above the current filed rate. These renewable energy purchases are considered to be "at a premium," meaning the block rate charged is in addition to what a member is already being charged for their monthly usage. Currently, CVEC has not had any members interested in purchasing renewable energy.

Biomass

Biomass is receiving increasing attention as scientists, policy makers, and growers search for clean, renewable energy alternatives. Compared with other renewable resources, biomass is very flexible; it can be used as fuel for direct combustion, gasified, used in combined heat and power technologies, or biochemical conversions. Due to the wide range of feed stocks, biomass has a broad geographic distribution.

According to the U.S. Department of Energy, farms and animal-processing operations create animal wastes that constitute a complex source of organic materials with environmental consequences. This waste can be used to make energy or biopower. There are currently 10 gigawatts of installed biopower generation in the United States, with some resources available in the eastern portion of New Mexico.

Central Valley Electric does consider biomass to be a viable renewable energy and in conjunction with WFEC would be agreeable to meet with others interested in pursuing this resource.

Geothermal

Geothermal energy is the heat contained within the earth – a clean, reliable, and renewable energy. It can be used as an energy-efficient heating and cooling alternative and can generate vast electric power across the United States.

In addition to electricity production, lower temperature geothermal resources are used for direct heating applications and the constant temperature that exists at shallow depths can be used as an energy-efficient method of heating and cooling, called ground-source heat pumps.

Ground-source heat pumps are electrically powered devices that use the natural heat storage ability of the earth and/or the earth's groundwater to heat and cool homes and businesses. This process is simply moving heat from one place to another. The earth has the ability to absorb and store heat energy. To use that stored energy, heat is extracted from the earth through a liquid medium, either water or an anti-freeze solution, and is pumped to the heat pump heat exchanger. There, the heat is used to heat a home or office. In the summer, the system is reversed and indoor heat is extracted from a home or office and transferred to the earth through the liquid medium. Closed or open loop systems, along with heat pumps are used to implement the most effective means of transferring energy.

Tax credits are available, at the state and federal level, for both residential and commercial installations of ground-source heat pumps installed before December 31, 2016.

CVEC in conjunction with WFEC are currently in the process of evaluating this technology in an effort to put together a potential member program that would include geothermal. CVEC is also considering using the geothermal HVAC technology within a new headquarters facility currently under construction.

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 retail 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. CVEC 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. Additionally, given the option to reduce up to 10 percent of the RPSA Phase I capacity reduction using DSM programs, CVEC does have a potential financial motive to consider.

Central Valley Electric currently has four programs in place which are considered to be Demand Side Management Programs. Three programs are fairly new and one program has been in place since late 2009. The co-op will continue to evaluate these programs benefits to the co-op and its members. The programs in place consist of:

Marathon Water Heater Energy Efficiency Program

Water heating is the second largest energy consumer in the home. Using hot water efficiently enables members to save energy and money. By selling Marathon Water Heaters, CVEC 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, and have no stand-by heat loss.

In April 2009, CVEC 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, CVEC pays one-half percent of its operating revenue to the Commission for inspection and supervision fees. In accordance with Rule 572, CVEC can recover that fee by collecting one percent of additional revenue from its members. The funds collected from the state and CVEC members must be used for renewable energy and energy efficiency programs that benefit CVEC members.

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

A CVEC 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.

Since the program started in September of 2009, CVEC has sold 143 energy efficient Marathon water heaters (as of December 31, 2012). That is a potential estimated savings to the co-op of 3 kW, or 38,308 kWh, or \$1,885.90 (based on current wholesale rate of \$0.04923 per kWh) a year. That number will continue to increase as the co-op continues to sell water heaters.

Commercial & Industrial Lighting Rebate Program

According to the U.S. Energy Information Administration, lighting accounts for more than 20 percent of energy usage in commercial buildings in the United States.

Energy efficient lighting can help CVEC members save money on their energy bills, at the same time it can help the co-op lower wholesale power demands, thereby reducing the need for additional generation. Therefore, commercial and industrial members who are building new (new construction), or replace/upgrade (retrofit) the following inefficient lighting types (High Intensity Discharge (HID) Mercury Vapor, High and Low Pressure Sodium, Metal Halide, T12 Fluorescent, Incandescent, or Halogen) with the following efficient lighting types (T8 or T5 Fluorescent, Compact Fluorescent Lighting, Light Emitting Diode (LED) or Plasma Lighting) in existing facilities/buildings, or new buildings could be eligible for rebates.

Retrofit Rebates

The rebate on lighting projects is determined by comparing the actual lighting KW usage with the proposed KW lighting usage to be installed for existing buildings. Rebates will be paid at \$350 per KW reduced.

New Construction Rebates

Members installing tube fluorescents or compact fluorescent bulbs will receive a rebate of 15 percent of the equipment cost (labor costs not included). Tube fluorescent lighting must have high efficient electronic ballasts. Members installing Light Emitting Diode (LED) or Plasma lighting will receive a rebate of 30 percent of the equipment cost (labor costs not included).

*Rebates cannot exceed 60 percent of the lighting equipment cost (labor not included).

Since the program started in August of 2011, CVEC has had eight commercial and industrial members take advantage of this program. As of December 31, 2012, there has been an estimated annual savings of 68.48 KW or 458,697 kWh or \$22,581.65 (based on current wholesale rate of \$0.04923 per kWh). The energy savings will continue to increase as more members take advantage of the this rebate program.

Home Energy Audit Program

A home energy audit is the first step in assessing how much energy a home consumes, and can be used to evaluate what measures need to be taken to make the home more energy efficient. CVEC believes air infiltration and duct efficiency are two areas that can be assessed in a home energy audit that has the potential to lower a home's energy use and promote better air quality within the home.

CVEC has contracted with Star Efficiency Services to perform free home energy audits on member's homes and to make the appropriate corrections in the areas of air infiltration and duct efficiency.

Star Efficiency Services is a licensed and insured energy solutions consultant. They perform infiltration testing using a blower door test. If they find problems they will address them by means of sealing plumbing penetrations, window caulking, weather stripping around doors, sealing cracks and small to medium size holes. They also test the supply and return of HVAC systems. With this test they are able to find leaks in the supply and the return system that could be putting air into the attic, crawl space or walls, inefficiencies that could increase energy use.

This program is available to all CVEC residential members who have a home set on a permanent foundation.

The program started in September 2012, and as of December 31, 2012, there have been 24 homes that have received this free home energy audit. Based on calculations from the homes where audits were performed, there is an estimated annual savings of 23.94 KW or 146,734 kWh or \$7,223.71 (based on current wholesale rate of \$0.04923 per kWh) a year. As more members take advantage of the Home Energy Audit Program this number will continue to increase.

Heating & Air Conditioning Rebate Program

Heating and cooling is the number one energy consumer in the home. CVEC wants to encourage members to install energy efficient heating and cooling products when constructing new buildings or remodeling existing buildings. Therefore, CVEC offers the following rebate program for Heating and Cooling.

As members of Western Farmers Electric Cooperative, CVEC participated in their 2012 Rebate Programs for Ground Source and Air Source Heat Pumps.

Residential Program (Includes manufactured homes on a permanent foundation)

Ground Source Heat Pumps (GSHP) Rebate (*Desuperheater required*) – GSHPs use the constant temperature of the earth as the exchange medium instead of the outside air temperature. This allows the system to reach fairly high efficiencies (300%-600%) on the coldest of winter nights. On average, a typical home will require a 3-ton unit. System life is estimated at 25 years for the inside components and 50 plus years for the ground loop. A desuperheater is a small auxiliary heat exchanger that uses superheated gases from the heat pump’s compressor to heat water. This hot water then circulates through a pipe to the home’s storage water heater tank. In the summer, the desuperheater uses the excess heat that would otherwise be expelled to the ground. Therefore, when the geothermal heat pump runs frequently during the summer, it can heat all of your water. During the fall, winter, and spring – when the desuperheater isn’t producing as much excess heat – you’ll need to rely more on your storage or demand water heater to heat the water. (SOURCE: U.S. Department of Energy).

Residential Program (Includes manufactured homes on permanent foundation)

Ground Source Heat Pump (GSHP) Rebate (*Desuperheater required*)

➤ **Tier 1:**

- ✓ *On-site verification required*
 - ◆ Up to \$525/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 15.9 EER & ≥ 3.3 COP..... (*Desuperheater required*)
 - Open Loop: ≥ 18.0 EER & ≥ 3.6 COP.....(*Desuperheater required*)

➤ **Tier 2:**

- ✓ *On-site verification required*
 - ◆ Up to \$650/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 18.5 EER & ≥ 3.6 COP..... (*Desuperheater required*)

- Open Loop: ≥ 20.2 EER & ≥ 4.0 COP.....(*Desuperheater required*)

➤ **GSHP to GSHP:**

- ✓ *On-site verification required*
 - ◆ Up to \$225/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 3.0 EER Increase & ≥ 3.3 COP...(*Desuperheater required*)
 - Open Loop: ≥ 3.0 EER Increase & ≥ 3.6 COP.....(*Desuperheater required*)

Ground Source Heat Pump (GSHP) Rebate (*Desuperheater not required*)

➤ **Tier 1:**

- ✓ *On-site verification required*
 - ◆ Up to \$225/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 15.9 EER & ≥ 3.3 COP..... (*Desuperheater not required*)
 - Open Loop: ≥ 18.0 EER & ≥ 3.6 COP.....(*Desuperheater not required*)

➤ **Tier 2:**

- ✓ *On-site verification required*
 - ◆ Up to \$375/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 18.5 EER & ≥ 3.6 COP..... (*Desuperheater not required*)
 - Open Loop: ≥ 20.2 EER & ≥ 4.0 COP.....(*Desuperheater not required*)

➤ **GSHP to GSHP:**

- ✓ *On-site verification required*
 - ◆ Up to \$75/ton rebate
 - ◆ Minimum Specifications:
 - Closed Loop: ≥ 3.0 EER Increase & ≥ 3.3 COP...(*Desuperheater required*)
 - Open Loop: ≥ 3.0 EER Increase & ≥ 3.6 COP.....(*Desuperheater required*)

Air Source Heat Pump (ASHP) Rebate

- ✓ *On-site verification required*
 - ◆ Up to \$112.50/ton rebate
 - ◆ Minimum Specifications:
 - Minimum SEER of 16
 - Minimum EER of 13.4
 - Minimum HSPF of 8.5
 - Backup/Supplemental heat can be Natural Gas or Propane

In New Mexico there is a 30% (maximum \$9,000) tax credit for installing a GSHP (expires December 31, 2020). There is also a federal tax credit of 30% (no maximum). These systems must be installed by December 31, 2016 to qualify for the federal tax credit.

* EER – Energy Efficiency Rating is how many British Thermal Units (BTU) per hour are used for each watt of power it draws.

*COP – Coefficient of Performance is heat delivered (output) in BTUs per hour divided by the heat equivalent of the electric energy input. The higher the COP, the higher the efficiency of the equipment.

*Seasonal Energy Efficiency Ratio (SEER), which is the total heat removed from the conditioned space during the annual cooling season, expressed in Btu, divided by the total electrical energy consumed by the heat pump during the same season, expressed in watt-hours.

*Heating Season Performance Factor (HSPF), which is the total space heating required during the heating season, expressed in Btu, divided by the total electrical energy consumed by the heat pump system during the same season, expressed in watt-hours.

As of December 31, 2012, there have been no rebates issued through this program. CVEC is still working closely with WFEC to determine the geothermal potential and to come up with a geothermal program.

Interruptible Rate Program- The objective of this program is to provide a credit for members 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. Currently, CVEC does not have any members signed up for the Interruptible Rate Program.

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 members. Central Valley Electric envisions an Interruptible Rate program may be beneficial, and the evaluation of such a program is planned.

ENERGY EFFICIENCY OBJECTIVES

Energy efficiency is using less energy to provide the same service. Energy efficiency is not energy conservation, which is reducing or going without a service to save energy. Anywhere energy is used; there are opportunities to increase efficiency. In most cases, energy efficiency measures will pay for themselves over time in the form of lower energy bills.

How quickly they pay back their investment depends on a lot of factors, such as the cost of energy, and the overall use of the measure – for example, how many hours an appliance is on. Weather is a factor when the measure is related to maintaining environmental conditions – in air conditioning, or heating for example.

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, and enhances the economy.

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.

2012 Energy Efficiency Goals

The following are energy efficiency goals for CVEC for the year 2012 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 co-op website. The co-op will also utilize new resources which are available because of the co-ops membership in Touchstone Energy (Together We Save website, numerous articles and printed materials, as well as radio spots and bill stuffers). Through these energy

efficiency programs, CVEC 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 2012, CVEC published numerous articles on energy efficiency, such as proper maintenance of HVAC systems, the advantages of using energy efficient lights, programmable thermostats and more. Also, co-op employees would offer energy efficient tips to members calling about high bills, or those inquiring about how to save money on their electric bills.
- CVEC will participate in an energy efficiency study with WFEC to help determine potential energy saving programs for agricultural and oil and gas applications.
 - WFEC has to conduct an energy efficiency study.
- CVEC will participate in a study with WFEC to determine the potential for a geothermal heat pump program.
 - This is currently still in progress.
- CVEC will continue to evaluate the above mentioned commercial and industrial lighting rebate program, and recommend changes if the need arises.
 - Changes to this program were modified in June 2012. The program was changed to offer a rebate based more on the KW saved rather than on the equipment. Changes to the program were listed on page 10.
- CVEC will research and implement an energy audit program for residential and commercial members.
 - In 2012, CVEC implemented a Home Energy Audit Program. This program allows members to get a Home Energy Audit at no cost to them. Program details were listed on page 10.

2013 Energy Efficiency Goals

The following are energy efficiency goals for CVEC for the year 2013:

- 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 co-op website. The co-op will also utilize new resources which are available because of the co-ops membership in Touchstone Energy (Together We Save website, numerous articles and printed materials, as well as radio spots and bill stuffers). Through these energy efficiency programs, CVEC 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.
- CVEC will continue to work with WFEC to determine the potential for a geothermal heat pump program.
- CVEC will evaluate the following as potential DSM programs.
 - Programmable Thermostats
 - LED light bulbs
 - Insulation
 - Distributive Generation

- CVEC will continue to monitor and evaluate current DSM programs and make adjustments as necessary.

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 result of load reductions in the RPSA, Central Valley Electric 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 gas 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, CVEC 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 the existing SPS Replacement Power Sales Agreement and wholesale power purchases from WFEC to meet current and future power needs. This decision is based upon the following reasons:

1. The SPS RPSA, when compared to other resources, was well below in cost per kWh.

2. WFEC is expected to build generation resources to meet CVEC's long term wholesale power requirements. CVEC will have an equity ownership in these power plants and has begun paying equity to WFEC. Additionally, WFEC will provide for CVEC's Phase I Load Reduction within the SPS RPSA beginning June 1, 2012.
3. Power reliability has been good with SPS, as well as their handling of Central Valley Electric's scheduling and power needs. This allows the co-op to forego having a full-time forecaster and planner/scheduler for daily and hourly power requirements. WFEC will take over this function beginning in 2022.

Central Valley Electric Cooperative is recommending the above programs and will research ways in which we can incorporate more energy efficiency programs.

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 for CVEC's current Load Forecast Study. CVEC does provide an annual load forecast to WFEC, SPP and SPS for planning purposes.

1. The Load Forecast Study is expected to be updated annually.
2. WFEC will become CVEC's wholesale power provider in the future and therefore will have input into generation resource decisions as CVEC will have representation on the WFEC Board of Trustees to provide input on generation decisions.
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.

VALIDATION AND EVALUATION

Current projects such as the Marathon electric water heating program, the Home Energy Audit Program or the commercial and industrial lighting rebate program require different methods to validate present consumption versus projected savings. With the lighting program information will be gathered on the type of lighting being replaced and comparing that with the energy usage of the new lighting. The electric water heater program will require gathering information on the water heater being replaced, reviewing the customers' monthly utility bills and determining what portion is for water heater consumption and what portion is for miscellaneous usage. 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 Cooperative has two resources for its power supply. It would be reasonable to assume that the majority of Central Valley's power purchases from SPS or WFEC would come from fossil fuels and would, therefore, be considered unfriendly to the environment. However, in

2012, 6.07 percent of CVEC's wholesale power from SPS was tagged as renewable energy. Because of the vast amount of resources which SPS and WFEC possesses, it is difficult to determine from which generation source Central Valley's power needs are being met.

CVEC had begun paying equity to WFEC towards construction of a highly-efficient, combined cycle natural gas power plant to be located in Woodward, Oklahoma. This power plant will emit much less carbon than the power plants owned and operated by SPS. The power plant is expected to be commercial by June 2017, coincident with CVEC's Phase II Load Reduction requirements in the SPS RPSA.

Action taken by Board:

On January 23, 2013, CVEC's board of trustees voted to adopt this Integrated Resource Plan.