Colorado Springs Utilities

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Electric Integrated Resource Plan

Colorado Springs Utilities
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January 10, 2005

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EIRP Executive Summary

This Electric Integrated Resource Plan (EIRP) describes the planning process Colorado Springs Utilities has used to develop its long-term resource plan and short-term action plan.

Colorado Springs Utilities has developed the EIRP to meet the needs of our service area through the year 2024. As part of the EIRP, Colorado Springs Utilities utilized a mix of coal, gas, and hydropower generation, long-term contracts, spot market purchases, renewable energy, demand side management, and planned future resources to ensure reliable services at the lowest cost.

Existing resources are adequate to meet current customer demands and reliability requirements, however new resources are needed to meet forecasted demand for electricity. To this end, the EIRP considers various criteria and recommends a portfolio of resources that provides a balanced and responsible low-cost plan that meets reliability requirements, is fiscally sound, promotes environmental stewardship, is flexible, and balances risk and cost.

Evaluations for the ongoing EIRP process identified events which have reduced the electric load forecast, making it necessary to defer significant new electric resources until the 2011-2015 timeframe. These events include the economic downturn, changing electric load and load patterns, and outlook of the semiconductor-manufacturing sector with some customer load not increasing as previously forecasted.

The EIRP results show that Colorado Springs Utilities currently has adequate electric generation supplies for the next ten years. Colorado Springs Utilities is primarily dependent on coal generation with growing reliance on natural gas generation, until new generating capacity is required in 2015.

The public involvement process brought stakeholders into an open decision making process that considers reasonable resource options to meet customer needs. Colorado Springs Utilities created two customer groups, the Technical Advisory Group (TAG) and Content Advisory Group (CAG) with members of the environmental community which were able to question, discuss and recommend the plans and environmental issues. The community values, through surveys demonstrated the following priorities:

1. Electricity price
2. Power supply
3. Environmental considerations

The public participation process resulted in one of the most extensive processes in the electric utility industry. The Issues Management Council recognized Springs Utilities for having a “superior issues management process” that addressed customer and community needs through the public participation process in the EIRP. Figure 1 illustrates the complex and integrated activities that support this effort.

The EIRP analysis evaluated 20 scenario options combining current Demand Side Management (DSM) plus four demand side scenarios based on detailed DSM study. It also included combinations of current renewable levels and three additional levels of renewable resources consistent with current capacity needs. The DSM options evaluated increased from current DSM levels to aggressive DSM. The renewable resources added to the system varied from the status quo to a high scenario. The status quo has existing renewable energy from 28 MW Tesla hydro, small hydro units, 1 MW wind purchase, and WAPA hydro purchases of 96 MW winter and 68 MW summer under adverse hydro conditions. Increasing amounts of wind, solar photovoltaic, and biomass are added from the low to the high renewable scenarios. The wind energy costs assumed were a combination of the results from the Renewable Energy Study and bids received through two market inquiries by Springs Utilities in 2004.

EIRP results support pursuing the medium renewable energy levels with small sized hydro energy in 2005, wind power resource in 2006-2008, medium sized hydro energy in 2011, and updating biomass options in 2005-2006. In addition, results support substantially increasing and pursuing moderate DSM levels starting in 2005, and conducting a customer load study in 2005. Regarding conventional supply-side resources, results support conducting the Coal Plants Master Plan and Longevity Assessment in 2005, continuing participation in the Colorado Generation Project, and monitoring clean coal technologies and coal opportunities. Coal based technologies are projected to be the lowest cost for significantly sized supply alternatives. Continue investigating additional transmission interconnection opportunities as needed to support supply options, generation availability and reliability of power supply.

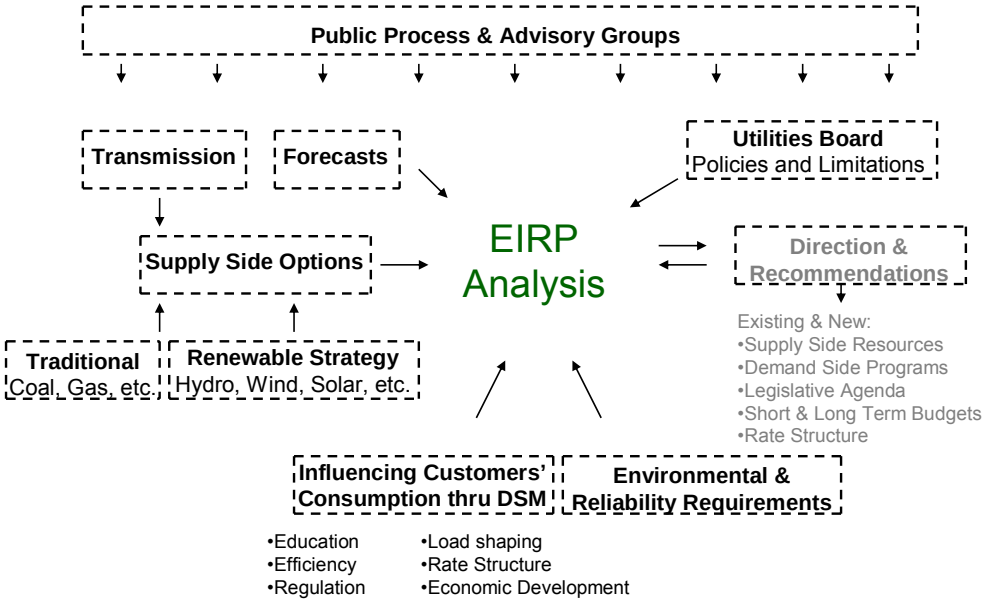
This recommendation will result in the lowest total supply cost and environmental benefits with an insignificant impact to the unit supply cost over the period. Moreover, it provides a proactive view of renewables and DSM technologies and significantly steps up programs in both areas from current levels, consistent with customer's preferences.

On November 22, 2004, the Utilities Board approved EIRP's recommendations. Therefore, Springs Utilities will begin developing DSM programs and renewable resources implementation as outlined in the EIRP, as well as pursuing action items.

Near the end of the EIRP process, the State of Colorado passed Amendment 37 RPS, requiring the state's largest utilities to use renewable energy resources such as wind, solar, small hydro and biomass to produce electricity. Amendment 37 requires producing 3 percent of retail sales produced from renewable resources by 2007, 6 percent by 2011, and 10 percent by 2015, of which 4% must be solar. As currently interpreted, the current EIRP will meet 68% of the 2007 targets, 50% of the 2011 targets and 27% of 2015 targets. To be in compliance for 2007 a small increase in current renewable technologies will be needed along with specified central and customer side solar installations, if applicable.

Springs Utilities has done some preliminary analysis on the economic impact of the RPS on the customers. Since the interpretation and actual implementation of the RPS is uncertain, Springs Utilities is not including this analysis as part of the EIRP. Utilities' strategy towards RPS will be considered in future EIRP reviews and updates.

Figure 1 - EIRP Analysis



Introduction and Purpose

This Electric Integrated Resource Plan (EIRP) is prepared and submitted to the Western Area Power Administration (Western) in compliance with Section 114 of the Energy Policy Act of 1992 (EPAct). The EPAct requires Western customers to engage in an open planning process in which all reasonable resource options to meet future energy service requirements are considered. Resource options must include Demand Side Management (DSM) techniques and renewable energy resources, as well as traditional supply-side resources. To the extent practical, adverse environmental effects must be minimized. Ample opportunity for full public participation in preparing and developing the EIRP must be provided. A five-year Action Plan is required.

The objective of this EIRP is to update the 2002 EIRP, comply with EPA regulations and develop a new EIRP which reflects new information and resource options. Evaluations of the ongoing EIRP process identified events in 2003 such as the economic downturn that have reduced the electric load forecast, making it necessary to defer new electric resources until the 2011-2015 timeframe. Springs Utilities recognized that there was a gap between the pursuit of a potential clean coal plant in 2003, and not specifically mentioning a coal option in the 2002 EIRP. The 2002 EIRP document placed emphasis on a five-year action plan and mentioned evaluating new thermal generation resources which can be coal and combined cycle units. To close that gap Springs Utilities decided to open a full process for an amended EIRP in 2004.

The planning process is said to be an "integrated" planning process because both supply-side and demand-side resources are evaluated together, using a consistent set of evaluation criteria.

This IRP Report describes the planning process Colorado Springs Utilities has used to develop its resource plan, and presents its Action Plan for the five-year period beginning January 2005 and continuing through December 2009.

Springs Utilities' annual peak demand and energy consumption figures for the past five years, required to be provided as part of this report, are shown in Table 5 (page 45).

Evaluation Criteria

Criteria have been developed to evaluate Colorado Springs Utilities' resource options. They are based on strategic direction, corporate priorities, Utility Board direction, industry practices and regulatory requirements, established by senior management, and feedback received from numerous surveys and focus groups conducted by Springs Utilities' staff. They were reviewed as part of the public process conducted during development of this integrated resource plan.

Vision of Service

Colorado Springs Utilities' vision of service to the community and its customers is founded on the wants and needs of its major stakeholders: City Council, Springs Utilities' customers, the business community, employees, local governments, and state and regulatory agencies. These wants and needs were recently evaluated in the context of the major external planning factors as follows.

Social/Political Changes

The citizens of Colorado Springs own Colorado Springs Utilities. Customers expect greater involvement in decision-making and more choices in services offered. The expectations and values of the public continue to evolve. It is clear that, as customers have had to work harder to maintain their standard of living, they have come to expect greater value, involvement, and choice in products and services they receive from Springs Utilities.

Technology's Impact

Technological advances shape the regulatory and competitive environment in which Colorado Springs Utilities does business, and they provide the tools to respond to change in a cost-effective manner. Springs Utilities must take advantage of the opportunities made possible by technological advances to better serve the community.

Environmental/Regulatory Impacts

The sheer volume of environmental regulations requires constant vigilance by Springs Utilities. Congress has enacted over 100 environmental laws, encompassing over 14,000 pages of text. Laws have been enacted covering drinking water, waterways, air quality, hazardous wastes, and other major areas. Other regulations are being developed to address such issues as greenhouse gases, toxic air emissions, and pollution prevention at the source.

Within this challenging environment of myriad laws and regulations, Springs Utilities must continue to develop resource plans and services which best serve its customers needs, while continuing to meet or exceed all environmental statutes and regulations.

Competition

The energy industry is transitioning to a more market-driven, competitive environment. The national Energy Policy Act of 1992 mandates several actions which affect the electric industry, resulting in the Federal Energy Regulatory Commission's movement of the electric and gas industries toward increased competition in the wholesale markets.

As the regulatory climate changes and Colorado Springs Utilities' historic monopoly status in the community could evolve into more open competition, customers will ask questions such as, "Can we buy electric services less expensively from another supplier? Can a private company deliver services more efficiently? Would another organization be more responsive to our community's needs?"

Another form of direct competition that could arise is the potential for mergers and acquisitions. As some utilities' financial health has deteriorated, it has become attractive for more-aggressive organizations to consider purchasing other utilities' assets. Indeed, fiscal challenges experienced by local governments across the country as a result of unfunded mandates, tax-limitation concerns, and changing economic circumstances could lead to pressure for transfer of ownership or operation of utilities to others.

Colorado Springs competes with other communities to attract and retain new industries that support the economic vitality and quality of life of our community. Spring Utilities with its reliable utility services and competitive electricity rates contributes to the economic advantage and low business operating costs that attract new businesses to relocate, positioning the community for the future.

In this impending competitive environment, Springs Utilities will best serve its customers by performing as well or better than any other organization could in acquiring new low cost resources and in providing superior utility services.

Vision Statement

Colorado Springs Utilities' vision statement is: "We add to the quality of life in Colorado Springs by working together to build value for our citizen-owners with a reputation for operational effectiveness, customer loyalty and competitive utility products and services."

The operations of Springs Utilities have a major influence on the quality of life in the Colorado Springs community. Directly, utility services are a necessity of everyday life. Indirectly, the ready availability and reliability of service at a competitive price help maintain our community's economic engine.

Value means something different than lowest possible cost. Customers today have additional expectations. Issues such as overall concern for the community, environmental sensitivity, aesthetics, health concerns, access to information, openness and responsiveness, employee attitudes, customer-friendly policies, and fairness are also involved in how people value Colorado Springs Utilities' services. This is not to say that Springs Utilities will not strive to have the lowest possible costs, but will consider and value other issues as well.

Colorado Springs Utilities is entrusted with resources having great value. Additional resources will be added in the future. Springs Utilities has a responsibility to operate the utilities systems in a manner that assures the safety and health of the public, and educate the public on the safe and efficient use of its products and services. The economic well-being of the community and its overall quality of life is, in part, dependent on Springs Utilities' constant efforts to be good stewards of these resources. Many of utility activities can potentially affect the environment. There are divergent interests which must be balanced to provide the greatest service to the community as a whole.

Planning Guidelines

The following Guidelines have been established at the beginning of the planning process by Springs Utilities senior management. These Guidelines must be fulfilled for Springs Utilities to meet its responsibilities to the Utilities Board and the community, so they cannot be violated.

Springs Utilities Will:

1. Plan for the future electric power needs of its customers.
2. Provide reliable electric service to current and future customers.
3. Meet all local and federal codes and regulations.
4. Identify and compare all practical options for supplying electric power and for using energy more efficiently.
5. Maintain competitive prices.
6. Meet the requirements of the Western Area Power Administration's planning process.
7. Strongly consider the values and preferences expressed by all people involved in this EIRP's public process.
8. Apply its professional judgment in the development of a responsible resource plan.

Evaluation Criteria

The resource plan recommended to the Utilities Board must add to the quality of life in the Colorado Springs community by assuring the highest value utility services. To ensure achievement of this goal, a number of evaluation criteria have been established. The attributes of each candidate resource plan will be evaluated against these criteria.

In some cases, the criteria conflict with one-another. To achieve the goal of providing the highest-value utility services, a balanced resource plan must be developed. Perhaps no single criterion will be achieved to its fullest, but a balanced resource plan will ensure that all criteria are achieved.

Following are the criteria by which resource plans will be evaluated.

Provide Highest-Value Utilities Services for Customers

The citizens of Colorado Springs own Springs Utilities. Springs Utilities' recommended resource plan must provide the highest degree of overall customer satisfaction within our community. The plan must be consistent with Springs Utilities strategic goal of adding to the quality of life by providing the highest-value utilities services for its customers.

Electricity cannot be viewed only as a commodity. Customers need and want varying types of services. While the recommended resource plan will strive to maintain the lowest possible prices, the plan must also serve the needs and wants of Springs Utilities' customers. Customer services which increase electricity prices above the minimum possible price may be recommended to fulfill customers' expressed desire for those services.

Springs Utilities' will strive to have fair and equitable rate designs which correctly charge customers for the cost of the services they are provided.

Meet Springs Utilities and Reserve Group Reliability Requirements

Springs Utilities' resources must assure adequate system reliability and also meet the reserve requirements of the Western Electricity Coordinating Council (WECC).

Springs Utilities system reliability considers how well each resource integrates into the overall system reliability. Factors which affect overall system reliability are a resource's overall availability, its availability during peak hours, and, if not located in the service area, the transmission path that brings the power to the system. Although a firm transmission path to Springs Utilities may exist, interruptions could occur. The likelihood of interruptions increases with the distance from Springs Utilities, the number of transmission systems through which the power is delivered, and the number of transmission TOT's which the power passes through. So a resource located in Wyoming with a firm transmission path to Springs Utilities probably would not be as reliable as a resource located in Colorado which has a firm transmission path.

The cost would be prohibitive for Springs Utilities, alone, to acquire and hold in reserve sufficient resources to assure an uninterrupted supply of electric power for its customers. For this reason, Springs Utilities joins with other electric utilities to create a pool of shared reserves that are available to all reserve group members. Springs Utilities is committed to comply with reserve group rules governing reserve requirements.

One key question is whether a resource will qualify as firm and reliable under reserve group rules. Another question is whether the resource receives credit under reserve group rules for quick-start capability (cold start to full rated capacity in 10 minutes or less). For purchase-power options, a firm transmission path is required to meet the reserve group's reliability requirements.

Maintain Financial Soundness

Many factors affect Springs Utilities' financial soundness. Springs Utilities must remain competitive and viable in the marketplace over the long term. The resource plan should assure Springs Utilities' continued viability in the marketplace.

The effect of a resource plan on Springs Utilities' bond rating will be carefully evaluated. Springs Utilities will recommend no resource plan that substantially erodes its favorable bond rating. Resource plans will be evaluated to determine to what extent the plan would affect the bond rating.

Rate shock also affects financial soundness. Does the resource plan require rate increases over a short time period of such magnitude that customers may be alienated?

Springs Utilities must have the capacity to raise the capital, that is required to fund the resource plan it recommends with no adverse effect on its financial soundness. Rate increases, if required, must be consistent with Springs Utilities' concern for its customers.

Springs Utilities ability to attract capital at reasonable rates is dependent on its ability to maintain financial integrity. Because a favorable financial rating is important to the customers, the resource acquisition decisions must maintain or improve its current Standard & Poor's AA bond rating and Moody's Aa2 bond rating, and Fitch's AA bond rating. These are high ratings awarded by the credit-rating agencies.

Minimize the Price of Electricity

Springs Utilities seeks to acquire resource options which minimize the price of electricity. When evaluating candidate resource plans, Springs Utilities will give substantial weight to the impact that plan has on the price of electricity. Springs Utilities will also consider the total cost of the resource plan, which includes the total of expenditures made by Springs Utilities and by customers to provide energy services for the community.

Rates and costs in the short term are usually given more weight than longer-term costs and rates, because short-term assumptions are usually more reliable than long-term assumptions.

Utilize Resources Efficiently

Springs Utilities will seek opportunities to develop four-service synergies with its resource plans. Resources which can be used to provide services for two or more product offerings (electricity, water, gas, wastewater), thereby enabling Springs Utilities to provide utilities services to the community at the lowest cost, will be recommended.

Springs Utilities' internal resources must be used efficiently in the implementation of the selected resource plan. Springs Utilities staffing requirements and the overall scheduling/ timing impact of resource additions on internal resources will be considered.

Springs Utilities will assist its customers to use their resources efficiently thereby contributing to their competitiveness and to the economic viability of the Colorado Springs community.

Springs Utilities will evaluate its own resources and will make capital investments in existing resources that will cost-effectively improve the efficiency of those resources.

Balance Benefits to the Environment with Achievement of Other Goals

Springs Utilities is locally owned and must always be a steward of our environment. Springs Utilities will carefully consider the candidate resource plans' impacts on the environment and will seek to achieve a balance between impact on the environment and achievement of its other strategic goals.

Renewable resources such as wind and solar produce no air emissions. They may also reduce perceived risks of heavy reliance on fossil fuels. Springs Utilities will consider all potential applications of renewable resources and will use renewable resources in applications which minimize electric rates. For applications involving renewable resources which do not minimize electric rates, Springs Utilities will weigh the impact on the price of electricity against the benefits of acquiring renewable resources. Such benefits may include reduced expenditures for electric services, reduced environmental impact, reduced long-term risks, and other benefits as well.

Of course, Springs Utilities will meet or exceed all federal, state, and local environmental laws and regulations.

Provide an Acceptable Balance between Risk and Cost

Capital-intensive resources must provide sufficient cost savings to justify their higher initial cost. Standard return on investment analysis will be used to quantify cost versus benefits.

The resource plan recommended by Springs Utilities must provide flexibility to accommodate unforeseen events, while continuing to provide competitively priced and reliable electric service. The recommended plan should be robust. For example, fuels should have long-term supplies and availability; remain cost-effective under future state and federal laws governing environmental impact of energy production, and make use of technologies that will likely remain attractive for power generation purposes into the future.

Emerging technologies, the advent of competition, and changing electric markets create substantial uncertainty and risk. The recommended resource plan must seek to minimize the price of electricity in the present, while providing a high degree of probability that the price will remain low and competitive, regardless of the scenario that unfolds in the future.

In evaluating resource plans. Short-term commitments are generally preferable to long-term commitments and minimizing prices in the short-term is generally preferable to lower overall prices in the long term. Costs incurred during the first five or ten years of a resource plan are given more weight than costs incurred during the second five or ten years of a resource plan. However, Springs Utilities is anxious to consider the potential benefits of entering into a long-term commitment, or making a long-term investment, and may choose to do so if the potential benefits warrant the additional risks that are assumed.

Springs Utilities will continue to have a favorable bond rating. No resource plan will be implemented that creates a substantially different risk position for Springs Utilities and bond holders. For this reason, Springs Utilities will evaluate all resource plans using a constant discount rate that reflects Springs Utilities continued favorable bond rating. Discount rates will not be varied to reflect varying risks of individual resource options.

Public Involvement

Public involvement in the Electric Integrated Resource Plan (EIRP) brought stakeholders into an open decision-making process that considers reasonable resource options to meet customer needs. The goal was to update the 2002 EIRP and develop a new EIRP to reflect new information and resource options. Completion of the EIRP includes public participation, fiscal responsibility and environmental stewardship. The final document reflects resource options which ensure quality and reliable electric service. The effort focused on building informed consent, gathering feedback from a diverse group of stakeholders, and obtaining input on final scenarios or alternatives.

Springs Utilities recognized that there was a gap between the pursuit of a potential clean coal plant in 2003, and the absence of a clean coal option in the 2002 EIRP. To close that gap, it was essential to re-open a full public process for an amended EIRP in 2004.

In addition, environmental stakeholders expressed concern regarding the next steps Springs Utilities will pursue regarding conventional technologies, as well as the analysis to ensure that it is the best alternative for the community. Electric load forecast analysis indicated that the load forecast anticipated in 2002 had dropped from 43 percent growth to 31 percent over the next ten years. The clean coal alternative resource was not originally listed in the five year plan of the 2002 EIRP because it was not an option during the public participation and planning process. As a result, Springs Utilities conducted due diligence within the standards and protocol of an EIRP by initiating a feasibility analysis to determine if clean coal would be the best resource to meet the city's growing electric needs now and in the future. Based on the electric load forecast analysis, which includes population, economic activity and consumption Springs Utilities discontinued the clean coal unit and suspended the feasibility analysis.
Recognizing that the load forecast had changed, Springs Utilities decided to update its 2002 EIRP and extend its study period to 20 years. Those efforts began in December, 2003.

The goals of public involvement and participation in the updated EIRP include:

- Identifying all potentially affected interest groups (stakeholders)
- Identifying all potential issues, concerns and values
- Educating and informing the public on the processes and issues
- Building trust and accountability with stakeholders

- Empowering the stakeholders to have input on the planning processes, so that issues are resolved quickly and efficiently, and project delays or costs are minimized.

Knowing that the stakeholders most impacted by the EIRP do not necessarily attend public meetings, the overall public participation plan focused on a variety of outreach activities to obtain the greatest input possible within the confines of budget and time. The plan included:

- Public meetings
- Content advisory group (CAG)
- Technical advisory group (TAG) for renewable and demand side management plans
- One-on-One stakeholder interviews
- Ambassadors outreach
- Community groups outreach
- Random sample customer surveys
- Focus groups
- Utility bill newsletter articles
- Website information
- Utilities Board and Utilities Public Advisory Committee updates

Strategy and Action Plan

Issue Identification/Problem Definition

In February 2002, Springs Utilities completed its Western Area Power Administration required Electric Integrated Resource Plan (EIRP). The EIRP is prepared and submitted to the Western Area Power Administration once every five years. The document adheres to Section 114 of the Energy Policy Act of 1992 (EP Act). The EP Act requires Western customers to engage in an open planning process which articulates reasonable resource options to meet future energy demands. The EIRP outlines the planning process Springs Utilities will pursue to meet those future demands. All resource options (demand-side management, renewable energy, and conventional) will defer to the EIRP as the guiding master plan.

The plan was completed with public participation and outlined several key strategies for providing resource options through 2007. The plan recognized alternatives that Springs Utilities should pursue for additional electric generation including:

Promoting energy efficiency through new programs, called Demand-Side Resources.

Pursuing hydroelectric power opportunities.

Purchasing wind power.

Utilizing reciprocating engines.

Utilizing combustion turbines.

Adding and converting combined cycle units.

Entering into short-term power purchases.

Expanding the lighting retrofit program.

Highlighted within the plan is the growing need for electric supply in the last five years of this decade. Realizing this in the fall of 2002, Springs Utilities applied for a United States Department of Energy sponsorship under President Bush's Clean Coal Power Initiative, for a 150 MW fluidized bed boiler with state-of-the-art emission controls. Springs Utilities recognized this as an opportunity, and was one of 36 companies to apply for the first round of Clean Coal Initiative funds valued at $5 billion dollars in 2002. In January 2003, the Department of Energy announced that Springs Utilities had been chosen as a demonstration project for a Next-Generation Circulating Fluidized Bed Coal Generating Unit.

A gap existed between the completed 2002 EIRP and the pursuit of the Clean Coal Project. Since coal was briefly referenced as an option in the 2002 IRP, we pursued the EIRP through a public process which would include the project as a resource option. Consequently, we invited our original participants to a workshop on July 28, 2003 to review, and comment on the amended EIRP. In addition, we had an obligation to fulfill the NEPA process which is required for a federally-funded Clean Coal Project. On September 3, Issues Management met with environmental stakeholders to listen and learn about their concerns over the EIRP and Clean Coal Project. That evening, the environmental stakeholders also shared their comments at the Department of Energy's NEPA scoping meeting. Both efforts resulted in environmental stakeholders expressing strong opposition to the Clean Coal Project and concern over the gap in the EIRP.

Major concerns were:

The absence of coal in the 2002 EIRP.

The pursuit and allocation of funds toward the Clean Coal Project.

The need to follow a process that demonstrates the EIRP is thorough and the overarching driver for resource options.

Perception that the Clean Coal Project was a "done-deal" regardless of the EIRP process.

Lack of responsiveness and responsibility for the EIRP document.

Inability to share analysis associated with the EIRP and Clean Coal Project.

Lack of thorough analysis of other resource options in the IRP.

The lack of responsiveness on our part to the environmental stakeholders' questions has generated multiple questions and the creation of a white paper entitled *Opportunities for Clean Energy for the Springs Utilities.* The white paper was given to City Council on September 23, 2003. The environmental stakeholders not favor a clean coal unit.

Desired Outcome

The decision was made to update the 2002 EIRP and develop a new EIRP to reflect new information and resource options. Completion of the Electric Integrated Resource Plan (EIRP) includes public participation, fiscal responsibility and environmental stewardship. The document will reflect resource options which ensure quality and reliable electric service.

In an effort to be responsive, Issues Management has developed a public participation/communications plan to address the new EIRP with the following:

Next Steps

Springs Utilities must listen to all stakeholders and show that we care. While we appreciate environmental concerns, we must also be responsible to our customers and their financial expectations with respect to keeping low rates. Springs Utilities must demonstrate the process is reasonable, sensible and responsible, and that we are the right entity to address the problem. Springs Utilities must also address the problem of meeting electric load demand after 2007 forward.

Stakeholders

Primary: Residential customers, military customers, business users, environmental stewards, Western Area Power Administration.

Secondary: Affiliate government agencies, citizen groups, service organizations, Coalition of Chambers.

Objectives

1. Establish the legitimacy of the agency and project (EIRP)
2. Maintain the legitimacy of the agency and project
3. Establish the legitimacy of our problem-solving and decision-making processes
4. Maintain the legitimacy of our problem-solving and decision-making processes
5. Establish and maintain the legitimacy of earlier decisions and assumptions
6. Get to know all potentially affected interest groups and individuals
7. Get to see the project through their eyes
8. Identify all potentially relevant problems
9. Generate alternative solutions
10. Articulate and clarify the key issues
11. Protect and enhance credibility
12. Provide all the information needed to communicate with various interest groups
13. Receive and understand all information the potentially-affected interests need to communicate to you

14. Depolarize PAI's who have diametrically-opposed values
15. Narrow the gap between interests who are polarized for some other reason

Techniques, Short-term (November, 2003 – June, 2004)

To meet the above objectives:

Inform and educate the public on the EIRP and the rationale for an amendment.

Listen to all stakeholder comments and concerns.

Share all analyses and information to date.

Schedule and document all opportunities for public input and share information with all stakeholders.

Maintain open lines of communication with all stakeholders: listen and respond to all questions, documents.

Work with Resource Supply, Market Planning and Development to integrate resource sub-teams in all public processes now and in all future planning efforts.

Action Steps

Present 2002 EIRP amendment process to original participants and expanded primary stakeholder group: Greg Berwick, Gary Kettner, Gail Conners, Kristin Bricker, July 28, 2003.

Conduct additional one-on-one meetings with environmental stakeholders to address all questions: Lisa Mills, Gail Conners, Wayne Vanderschuere, Diane Walker, John Tancock, (among others) September – October 2003.

Make Issues Management the community liaison for all communication between Springs Utilities and its EIRP primary and secondary stakeholder groups: August-October.

Conduct three public meetings.

Conduct up to 20, one-on-one, 30-minute stakeholder interviews (customers, environmental groups, and affiliate agencies, the media, policy makers) with questions developed by project staff and reviewed by primary stakeholders. Interviews will reflect a broad spectrum of stakeholder interests, perceptions and values. Responses will be incorporated into the amended plan. We solicited internal help with questions, as well as stakeholder involvement. July, 2004.

Create a content advisory committee that consists of a broad spectrum of interests: financial, cultural, socio-economic, etc. Group of 8-10 people will offer public review and comment on the EIRP, and the results of the RES/DSM plan by the Technical Advisory Group. Work schedule is Jan.-Sept., 2004.

Create FAQ document for website (Jan., 2004) based on questions generated from July 28 workshop, and additional stakeholder Q and A on Gail Conners, released to participants on August 27; and Oct. 31, 2003.

Conduct one-on-one meetings as needed with primary and secondary stakeholders requesting additional information (environmental, business groups, etc.) Lisa Mills, Kristin Bricker, Gail Conners, and project team members, Sept. 3, and Oct. 7, 2003.

Schedule presentations to civic, business, environmental and other social groups, (Pikes Peak Area Council of Governments, Springs Industry, CONO, Economic Development Corp., Coalition of Chambers, US Forest Service, etc.) and document all responses, Jan.-Sept., 2004.

Prepare a fact sheet for the July 28, 2004 workshop and any additional presentations and leave behinds: Gail Conners. Done, updated.

Develop a database of all stakeholders to ensure efficient, direct communication on all issues and actions related to the amended EIRP, the Clean Coal Project (discontinued), its Dept. of Energy NEPA process, and the formation of Springs Utilities Renewable Strategy Plan. Ongoing.

Create a process diagram that graphically illustrates how the EIRP, Clean Coal and Renewable Strategy Plan, DSM are interrelated and impact one another, Nov. 2003. Done.

Create a library of study documents and Q and A for public review that articulates the decision-making process. Answer the question, “How did we arrive at our conclusion?” Jan. ’04.

Develop a summary/listening log of all stakeholder comments and place on the Internet. November, ongoing.

Develop project links on Springs Utilities website for the EIRP and Clean Coal Project (discontinued). Links will provide public participation opportunities: a reading library of study documents, fact sheets, press releases related to the projects, schedules and timelines, relevant RFPs (wind power, etc.) and contact information: Jan., ‘04 – ongoing.

Develop a Listening Log via Springs Utilities website for the IRP and Clean Coal Project under “Capital Projects” Jan. ’04.

Introduce the Renewable Strategy Plan and DSM concepts at all public participation activities for EIRP and Clean Coal (discontinued): beginning Jan. ’04.

Work with Resource Supply Department to define the role of the EIRP consultant and its report: (dates subject to change).

Pursue RFP consultant deadline of Dec. 5, 2003.

Pursue consultant report to be completed in October 2004.

Pursue the EIRP is amended and drafted for Utilities Board in September 2004.

Schedule third EIRP workshop prior to draft EIRP report to the Utilities Board (June, 2004). Workshop will review public input, and consultant findings. In short, “Here’s what we heard, did we miss anything?” June, 2004.

Work with Market Planning and Development Research staff to review and implement public process and communications plan for Renewable Energy Strategy Plan; develop primary and secondary stakeholder group; and potential deliberative polling effort. Kick off meeting. 12.1.03. Plan completed 4.30.04.

Publish EIRP/Clean Coal (discontinued) pubic outreach/input opportunities through the media, Springs Utilities' Connection, website and paid advertisements. Two Connection articles in March '04 (during process) and May'04 (draft recommendations) prior to U.B. Paid ads should be placed as an invitation to each of the three public meetings.

Conduct an SDIC/PIO workshop with Clean Coal (discontinued) project team and stakeholders to develop in-depth public participation and communications plan, 12.18.03.

Techniques: Long-term (Jan. 2004 - 2008)

To meet objectives 1-15:

Inform and educate the public on the EIRP and the rationale for an amendment.

Listen to all stakeholder comments and concerns.

Share all analysis and information to date.

Schedule and document all opportunities for public input and share information with all stakeholders.

Maintain open lines of communication with all stakeholders; listen and respond to all questions, documents.

Work with Resource Supply, Market Planning and Development to integrate resource sub-teams in all public processes now and in all future planning efforts

Action Steps

Identify the various stakeholders or 'publics' that should be involved and actively engaged in resource planning decision-making activities (similar to water planning activities) Ongoing.

Develop a detailed communications plan for each project (including budget, collateral materials, media story ideas, speaker's bureau, any advertising or marketing efforts and costs, press kits, media conferences, special events coordination, brochures, videos or newsletters). First quarter 2004.

Create a Renewable Energy Strategy technical content advisory group as a planning mechanism to Market Planning and Development. Group could be culled from the existing EIRP/Clean Coal (discontinued) stakeholder groups. Jan. '04 through 2005.

Consistently relate through all public meetings and all collateral material that the Renewable, DSM, or Clean Coal activities relate back to the "master plan," or EIRP. Ongoing.

Attend and participate in local renewable energy strategy and other sustainability project planning efforts (Fort Carson, community coalition groups, etc.) Ongoing.

Establish an EIRP decision-making process that includes the following steps:

Pursues a project planning/framework and endorsement by decision-makers.

Solicits issues and develops evaluation criteria: criteria to be used to evaluate the solutions based on community concerns/fiscal responsibility/technical/environmental factors.

Identifies resource alternatives that could address customer needs. Solicit stakeholder input.

Analyzes alternatives relative to the evaluation criteria (and stakeholder issues).

Makes a recommendation to final decision-makers.

Makes this decision process known to all.

Works with project team to identify content experts (Resource Supply, Planning and Engineering and Market Planning and Development) to make presentations as part of an ongoing Speaker's Bureau.

Techniques for Group Objectives 1, 2, 5, 8, 9, 11

Inform and educate all stakeholders on the EIRP and its resource options.

Listen to all stakeholder comments and concerns.

Share all analysis and rationale (public input and technical analysis) in choosing resource options now and in future planning efforts.

Look for creative and diverse public input opportunities to ensure all stakeholder interests are represented in the planning process.

Action Steps

Ensure that all Springs Utilities communications on the projects are received and understood.

Spell out in clear, concise language the "null alternative" if Springs Utilities chose not to enact or review fuel options (Clean Coal, Renewable Energy, Demand Side Management).

Maintain a reading library of all study documents, analyses, and public comment and make available through presentations, meetings and the website.

Maintain a fully functional internal database system for documentation on the EIRP/Clean Coal (discontinued) and Renewable Energy Strategy, now and for future planning efforts.

Develop resource options and links to other entities, such as the Dept. of Energy and Western Area Power Administration (WAPA) websites.

Meet the requirements of the NEPA process by working closely with the Department of Energy and sharing all comments and information with the DOE and Springs Utilities stakeholders.

Demonstrate how the NEPA process parallels Springs Utilities' own public outreach efforts.

Produce and release all collateral materials to all EIRP/Clean Coal (discontinued) and Renewable Strategy stakeholders and the media.

Establish and maintain the legitimacy of assumptions and earlier decisions of the 2002 EIRP and Clean Coal Project (discontinued) process by locating and making available previous study documents and ongoing analysis documents such as the auditor's report due by December, 2003.

Review public comments and previous customer marketing studies which contributed to the 2002 EIRP and current efforts, such as DSM and Renewable Strategy. Ongoing.

Work with project team to identify content experts (Resource Supply, Planning and Engineering and Market Planning and Development) to make presentations as part of an ongoing Speaker's Bureau. Ongoing.

Minimize impact of misinformation by identifying all potential problems; creating a "myths vs. facts" document; articulating the key issues and findings; incorporating all stakeholder values and concerns into the decision-making processes and consistently "reporting back" to stakeholders all key findings, timelines and opportunities for involvement. Ongoing.

Public Meetings

Four public meetings were held throughout the planning process: January 29, March 31, June 2 and August 31. Each meeting focused on a specific concept.

January 29, 2004 Meeting

This meeting was intended to introduce, educate and inform stakeholders on the EIRP process by providing the public an opportunity to comment on our planning process, identify stakeholders and potential issues and concerns. Break-out sessions were conducted on potential stakeholders, criteria for energy resource selection, and public process considerations.

Outcome: The meeting concentrated on the public process: identifying stakeholders, key issues and concerns regarding our planning processes, and reviewing EIRP criteria. Twenty-four participants attended the event. The SWOT (strength, weaknesses, opportunities and threats) analysis revealed:

- Strengths: low rates, reliability and responsiveness
- Weaknesses: forecasting difficulties, perception of "not listening"
- Opportunities: education, information and partnerships for long-term resource planning

- Threats: uninformed stakeholders and hidden costs such as air quality, compliance regulations which could hinder lower rates.

March 31, 2004 Meeting

This meeting was called to review and comment on major components for EIRP consideration including:

- Current forecast situation
- Existing resources
- Demand Side Management
- Supply additions and new technology
- Renewable Energy Strategy, including wind power

Outcome: Thirty-six participants were educated on the scope of the EIRP and its overarching relationship to the Demand Side Management and Renewable Energy Options plans. Those in attendance were divided into rotating groups to learn about DSM, renewable energy options and conventional technology.

June 2, 2004 Meeting

This meeting focused on reviewing the public process to date:

- What we have heard, and what we have missed based on each strategy of the EIRP (Demand Side Management, Renewable Energy and Conventional Energy), and planning processes to date.
- Survey results shared
- Status reports and preliminary findings for Demand Side Management, Renewable Energy Strategy and Conventional Energy

Outcome: Twenty-eight participants visited four stations in an open house format. The stations consisted of: public comment and survey results, renewable energy options, DSM options and conventional energy options. Participants engaged in conversation with subject matter experts who reported out at the end of the meeting.

August 31, 2004 Meeting

The purpose of this meeting was to review EIRP scenarios and obtain public input prior to review by the Utilities Board and Utilities Public Advisory Committee.

Outcome: Twenty-nine participants were in attendance to review four scenarios for final consideration of the EIRP. Subject matter experts and facilitators were at each station to answer questions and record comments. The four scenarios were:

- Status Quo
- Low: not trivial DSM and low renewables
- Medium: moderate DSM and medium renewables
- High: moderate/aggressive DSM and high renewables

Participants were then asked the following questions:

Do the criteria we are using make sense?

Are the combinations (conventional, DSM and renewable options) used for the final study reasonable?

Are the amounts of each combination reasonable?

Did we miss anything?

Are drivers and additional scenarios reasonable?

Content Advisory Group (CAG)

The EIRP CAG was a representative cross section of the Colorado Springs community, which helped guide public processes in alignment with the technical analysis required for the long-range Electric Integrated Resource Plan. The CAG was a forum for bringing the public's ideas, issues and concerns into the planning process. The CAG focused on impacted stakeholders and made recommendations to the project team to help ensure the plan reflects the concerns of all potential interests. The CAG and Springs Utilities helped create an informed public so that the plan would have informed decision makers. The CAG was a collaborative effort between Springs Utilities and its citizen-owners. In January 2004, invitations were sent to 34 agencies or individuals to solicit membership in the CAG. Also in January, two ads were placed in ***The Gazette*** soliciting volunteers for the CAG. Selection was made based on the diversity of applicants. Membership was sought from environmental, small commercial, homeowners associations, senior citizens, the ratepayers group, residential, industrial, military, education, non-profit and government sectors.

Overall Comments: Though some members were lost through attrition, the majority of the CAG members felt the experience was beneficial and have offered sound suggestions and advice for improving future long-range planning processes.

Technical Advisory Group (TAG)

The purpose of the TAG was to provide technical input on individual Renewable Energy and Demand Side Management (DSM) technologies (programs, plans) as well as to review broader Renewable Energy/DSM strategies. Eleven DSM and renewable energy technical experts volunteered to advise and offer input to the reports. TAG met monthly for six months and provided invaluable insight and comments on the respective reports and the EIRP.

The TAG reviewed:

Strategy approach and methodology.

Draft Renewable Technology Analysis (including cost and implementation feasibility).

The technology screening tool used to determine the feasibility of various technologies.

Overall draft document review.

The Environmental Ends and UPAC's recommendations related to these Ends.

Customer survey.

The proposed questions in our "long" survey.

The results of the long and short surveys.

All components of the DSM Plan including:

Objectives and strategies

Cost effectiveness, calculations and modeling

Program options

Screening criteria

Scenario target modeling

Overall draft plan

One-on-One Stakeholder Interviews

To attain the values and sentiments of a cross-section of the community, Springs Utilities conducted 17 one-on-one stakeholder interviews with a cross-section of the community, which included representatives from the following:

- Large, medium and small businesses
- Voter's advocacy groups
- Environmental groups
- Community/service agencies
- Parent-teacher group
- Builder/developer community
- Government
- Military
- Media
- Economic development
- Chambers of Commerce

Overall Comments: One-on-one stakeholder interviews were not significantly different from statistically-valid survey results. The majority of ratepayers interviewed support demand-side management programs and renewable energy, prefer to see less reliance on coal and expensive gas, are concerned with dwindling conventional fuel stocks, are divided on who should pay for the services, and suggested that educating and informing the public is integral to the decision-making process.

Ambassadors Outreach

One method used to reach a broader audience was to solicit the help of Springs Utilities' Ambassadors. The Ambassador program is a volunteer program for employees who are encouraged to belong to local civic and community groups to be the "ears and voice" of Springs Utilities. Ambassadors actively participate in local organizations helping to communicate key messages, gather feedback from the community, and build one-on-one relationships with our citizen owners. Ambassadors receive training in key communications, procedures for capturing and reporting customer feedback and utilize Springs Utilities resources to further educate and inform customers and citizen-owners. In February 2004, the Ambassadors received an EIRP presentation and a packet of EIRP materials. They were asked to hand out the EIRP fact sheet and three citizen value-oriented questions at their respective meetings and then collect and return the surveys to the project team. Market Planning and Development reviewed the responses from the Ambassadors with randomly surveyed customers to represent a voice of the typical customer. Altogether, 831 three-question surveys were received in March and April. Data was received from a variety of sources:

- Ambassador Surveys (546)
- Outbound Randomly designated Customer Phone Surveys (200)
- Web/Customer Surveys (74)
- Web/Employee Surveys (11).

The survey read:

Beginning in January, 2004, Springs Utilities will begin its public planning process for its Electric Integrated Resource Plan (EIRP). The EIRP is long-term strategic plan used for the company's business development, which also meets the requirements of the Energy Policy Act of 1992. To arrive at a final plan, energy planners must look at a number of factors which constantly change. Cost, efficiency, legislative regulations, competition, customer-preferences, the environment, and population are key to a successful planning effort. Your efforts to the following questions will help us in determining customer preferences.

1. We are initiating the development of our EIRP (Electric Integrated Resource Plan) which will outline future plans for Springs Utilities in the generation and supply of electricity to our community. As we begin this effort, what would you want to be sure we address in our strategic planning? Submit all thoughts that apply:

2. Thinking of any number between 0 and 10 where 0 is "not important" and 10 is "very important"; please rate how important the following are to you as a member of the Colorado Springs community and as a customer of Springs Utilities:

a) Springs Utilities shows concern for the environment, circle one number:

"Not important" 0 1 2 3 4 5 6 7 8 9 10 "Very important"

b) Springs Utilities delivers what they promise, on time, every time, circle one number:

"Not important" 0 1 2 3 4 5 6 7 8 9 10 "Very important"

c) Springs Utilities offers low rates, circle one number:

"Not important" 0 1 2 3 4 5 6 7 8 9 10 "Very important"

d) Springs Utilities offers the convenience of four combined utility services, circle one number:

"Not important" 0 1 2 3 4 5 6 7 8 9 10 "Very important"

3. Of the following priorities that we must consider, please tell me which of the following is your FIRST priority, which is SECOND priority, and THIRD priority?

a) price

b) adequate power supply, where power supply is defined as Springs Utilities' ability to meet customer power needs

c) environmental considerations

FIRST PRIORITY, circle one: a) b) c)

SECOND PRIORITY, circle one: a) b) c)

THIRD PRIORITY, circle one: a) b) c)

Results

The first three-question survey was launched in February. It was designed to help Springs Utilities understand our customers' values as we proceeded with the EIRP.

We found people prioritized their values as below:

78.7 percent feel it is important Springs Utilities delivers what it promises

69.6 percent feel it is important to show concern for the environment

66.2 percent feel it is important that Springs Utilities offers the convenience of four services

Of the following priorities that we must consider, please tell us which of the following is your FIRST, SECOND, and THIRD priority. Is it: price, adequate power supply, or environmental considerations?

49.3 percent said adequate power supply is the top priority

32.4 percent said price was the top priority

18.4 percent said environmental considerations were the top priority

Community Groups Outreach

On February 19, 2004 a letter detailing the EIRP plan was sent to 566 community groups, service organizations and homeowner groups, to generate interest in EIRP presentations. Of the 566, 84 were returned. The EIRP project team made presentations to 26 groups between February and May. In addition to a presentation and general questions and answers, the groups also responded to the three-question value survey. They included:

El Paso Council PTA

Edward Jones Investments

Organization of Westside Neighbors

Patty Jewett HOA

Home and Garden Show, Phil Long Expo

Old Town Bike Shop Environmental Annual Meeting

Park Hill Neighborhood Assoc.

Family Expo

Rotary Club East Colorado Springs

Rampart Range Kiwanis

Civitan Club

Pikes Peak Sertoma Club

West Side Optimist Club

Woodman Hills Sertoma Club

Pikes Peak Lions Club

Mill St. Neighborhood

HBA Home and Garden Show

Business Users Group

El Paso County, Dept. of Parks and Leisure Services Advisory Board,

Leadership Pikes Peak

R and J Landscaping Show

Agilent Technologies

Holland Park HOA

Mesa Springs HOA

Colorado Renewable Energy

Raven Hills HOA

Random Sample Customer Surveys

In all, three customer surveys were launched during the EIRP planning process. The first three-question survey was designed to understand citizen values, the second statistically-valid survey focused on citizen-owner knowledge of renewable energy and demand side management programs, the third statistically-valid survey focused on determining the price associated with those programs and the customers' sensitivity to pay for those programs. Several members of the CAG raised questions regarding the use of a deliberative poll. Deliberative polling is a trademarked process developed by Professor James S. Fishkin, at the University of Texas at Austin. It is "a technique which combines deliberation in small group discussions with scientific random sampling to provide public consultation for public policy and for electoral issues." While Springs Utilities acknowledges the value of deliberative polling in some situations, other processes were adopted that were more cost-effective and timely. The team worked with the CAG and TAG to craft surveys that would accomplish similar results. In addition to the three-question values survey, two additional statistically-valid surveys were launched.

Survey Two (April, 2004): The second survey was launched in April and had 181 respondents. The survey focused on determining residential customers' awareness and preferences for renewable energy.

Survey Three (May, 2004): The third survey was more in-depth and examined customers' willingness to pay for renewable and demand-side management programs. The survey yielded responses from 300 residential and 200 commercial customers.

Highlights of the Surveys:

- When developing the Electric Integrated Resource Plan, customers advised us to consider PRICE first, then adequate POWER SUPPLY, then ENVIRONMENTAL CONSIDERATIONS (or low emissions).
- Only 52 percent of our customers are familiar with the term "renewable energy".
- Those familiar with renewables are most aware of wind, then solar and hydro.
- Given the choice of using renewables or fossil fuels for additional electric power generation, 86 percent feel we should focus on renewables. Eighty three percent of customers feel we should use more than we use today.
- Those familiar with renewables see the predominant benefits being cleaner air and endless supply. They see the drawbacks as expense and poor dependability.
- Fifty percent of our customers chose utility employees as the most trusted decision-makers regarding future use of renewables; 37 percent trusted customers to make the decisions.
- Customers feel it is of equal importance for Springs Utilities to invest in renewable sources and to develop programs to help customers use less electricity (DSM).
- Sixty five percent of our residential customers want Springs Utilities to include renewable energy sources in our supply mix even if it costs more than other supply options (an additional 10% said yes, depending on how much more it costs).

- Sixty six percent of our residential customers feel the additional cost for renewables and DSM (if there was incremental cost) should be charged to all customers through utility rates.
- The majority of our residential customers would pay $1 - $2 more per month to increase or double DSM programs and renewable power sources from current levels.
- The majority of our commercial customers agree with the concept of increasing the amount of renewables in our supply mix.
- The majority of our commercial customers agree with our commitment to increase the number of programs to help customers use less electricity.
- Fifty two percent of our commercial customers think the extra cost (if any) for renewables should be charged only to customers who choose those programs. Thirty nine percent said the extra cost should be charged to all customers through rates.
- The majority of commercial customers would accept a 3 percent monthly additional charge to increase renewable and DSM programs from present levels of less than one percent. The majority do not support a 6 percent increase to double programs.
- Community acknowledgement for commercial account participation in renewable programs is not considered important.

Discussion Groups

Springs Utilities conducted three discussion groups from March through May. The groups were targeted as those least likely to attend public meetings, but who are directly impacted by the outcome of the EIRP. Focus groups consisted of: senior citizens; low-income/affordable housing recipients; and commercial accounts.

- ***Senior Citizens***: A senior citizen focus group was held on April 21 and 23 seniors attended.
    - Seniors are more skeptical of utilities leadership and practice than customer base in general. For example, when Springs Utilities shared the Green Power product offer, they expressed doubt that the $3 per month would actually go to this program, as opposed to salaries or something else.
    - Seniors expressed support for renewable sources of power, but are skeptical it would cost more. They believed that Springs Utilities could invest capital to build a wind farm, and then enjoy less expensive power once the capital investment had been paid off.
    - Seniors were concerned about what they have already paid for in capital after years of paying bills, followed by the suggestion that now it is time the "young people" take their turn to pay for new things.
    - Seniors are sensitive to growth. They understand why people want to move here, but think that developers should absorb the incremental cost of growth.
    - Seniors favored cleaner energy sources overall, but are more price sensitive than the general customer base.

- ***Low Income/Affordable Housing Recipients:*** A discussion group was conducted on April 6, and five people attended. We caution that this group is probably not a valid representation of the total population of low income/affordable housing recipients.
    - Overall the participants favored environmentally-favorable energy alternatives.
    - Participants showed interest in the Green Power program, but they would most likely not be eligible to participate since some were delinquent in utility bill payments.
    - Though sensitive to a potential increase in cost, they still favored renewables.
- ***Commercial Accounts***: A focus group was held on April 29 and three commercial accounts attended. We caution that this group is probably not a valid representation of the commercial market.
    - Business representatives were open to using renewable sources of energy, due to the high rate of gas consumption.
    - They expressed the need for more incentives for demand side management programs.
    - They were skeptical about growth forecasts and Springs Utilities' motivation. Their preference was to spend smaller amounts of money at a given time, and minimize their investment.
    - The business group sees the value of renewables, but they have concerns over availability, reliability and consistent supply when the wind does not blow and the sun does not shine.
    - The business group said that experts on energy supply should be making the decisions, and if it is not Springs Utilities' staff, then the company should solicit help from experts in the field.
    - Group expressed concern that a politically-driven long range plan would be a disaster. They felt that a separate committee should ultimately set the policy.
    - Overall, the group mentioned that the business community should not bear the brunt of any increases due to new energy sources, or they will be forced to move their business elsewhere. They also believe developers should shoulder the costs of increased demand.

Conclusions

Based on the EIRP project team and its consultant RW Beck's analysis, no substantial new electric generation is needed until 2015, given adequate electric supplies well into the next decade. However, the analysis evaluated 20 different scenario options which combined various levels of DSM and Renewable Energy Options. The DSM options ran from modest but not trivial, to aggressive. The reference case, or current portfolio with DSM and renewable options, shows that customer demand could be met with new coal units in 2014, 2019 and 2023. The reference case was measured against 19 other DSM and renewable options. Then three final scenarios were developed with low present value of supply costs. The project team determined that the preferred scenario is a combination of moderate DSM and medium renewable levels which would keep costs low and respond to customer preferences, which are:

- Three megawatts of small hydro in 2006
- Thirteen megawatts of medium hydro in 2011
- Ten megawatts of wind power in 2006
- New coal capacity in 2016 and 2021
- Update biomass options in 2005 and 2006

Public input received during the planning process raised many issues and concerns:

- Should additional ratepayer dollars be spent on renewable resources now if they are not needed in the next 12-to-15 years?
- Who should pay for the cost of a moderate demand side management program and greater renewable energy resources – just those who want it, or should it be spread evenly among all customers?
- What will be the impact of Amendment 37 on all customers?
- What is the cost threshold that residential and commercial customers are willing to spend to have demand side management and renewable energy options.

Demand Side Management programs were highly valued by nearly all participants, who appreciate conservation measures and rebates. Many are familiar with the impact of the Water Savers conservation program, and understand the urgency of water conservation. However, many ratepayers indicated that they did not see the urgency of saving electricity, and therefore, more attention should be paid to informing and educating the public. Given the amount of public input, it is clear that the community generally supports less reliance on standard energy resources such as gas and coal, but is polarized over how much they are willing to pay for DSM programs and renewable energy options. Many participants felt that the costs for those services should be borne by those who want them, while those who indicated greater interest in DSM and renewables felt all customers should bear the cost for implementation. In short, public input revealed:

- Community values demonstrate the following priorities: 1. price, 2. power supply, 3. environmental considerations.
- People generally support renewable energy and demand side management programs, but cost is a deciding factor in overall acceptance.
- Springs Utilities should look for partnering opportunities to educate and inform the public about long-term resource planning

- Utilities needs to continue using multiple communication avenues to inform and educate the public regarding the EIRP, such as public meetings, the web site, media, bill inserts, and community outreach presentations.
- The majority of stakeholders feel Springs Utilities must be weaned away from coal and natural gas, resources which are finite resources and have increasing natural costs.

The Springs Utilities Electric System

Springs Utilities is owned by the citizens of Colorado Springs. Springs Utilities provides four utility services: electric, gas, water, and wastewater. Springs Utilities also owns and operates its own meter-reading and customer billing systems, its information-processing systems, and its own customer services group.

Because Springs Utilities provides four utility services, substantial economies of scale are realized. Springs Utilities also takes advantage of opportunities for synergy between utility services. One example of such synergy is the construction and operation of the Tesla hydroelectric unit at the outlet of the tunnel which conveys water from Rampart Reservoir to the McCullough Water Treatment Plant. By realizing economies of scale and synergies between the four utility services, Springs Utilities is able to minimize the prices paid for utilities services by its customers, and provide the highest-value utility services for its citizen-owners.

Electric Service Area

Springs Utilities serves 194,369 electric meter accounts. The Springs Utilities electric service area is approximately 500 square miles and has a population of 500,000. This area includes the cities/towns of Colorado Springs, Manitou Springs, Chipita Park, Green Mountain Falls, parts of Security, and some other unincorporated areas of El Paso and Teller Counties. Four military installations are located in the service area and are served by contract sales: Fort Carson, Peterson Air Force Base, Cheyenne Mountain Air Station, and the United States Air Force Academy. The City of Fountain will be served by contract sales through June 2005.

To provide electric service to these customers, Springs Utilities owns and operates nine thermal generating units and four hydroelectric units, has two long-term purchase contracts for hydroelectric power with the Federal government, has one long-term purchase contract for wind power, and has one long-term purchase contract from Front Range Power. Springs Utilities owns and operates 221 miles of transmission lines and 2,998 miles of distribution lines, of which 2,089 miles are underground.

Electric Generating Units

Springs Utilities owns and operates 614 megawatts of installed generation capacity, as shown in Table 1. Capacity ratings differ slightly between the summer and winter seasons because capacity ratings on Springs Utilities' combustion turbines are reduced during summer months due to higher ambient air temperatures, and capacity ratings on the Manitou and Ruxton hydroelectric units are lower during winter months because of reduced water flow from Springs Utilities' reservoirs.

Springs Utilities' four coal units total 463 megawatts and provide low-cost, base-load energy for the Springs Utilities system. Springs Utilities has an ongoing preventative maintenance program for its generating units, and these units are assumed to remain available throughout the study period. The reliability of Springs Utilities coal units consistently exceeds moderates for similarly sized units. Although the reliability of the units may decline over the coming years, existing maintenance programs should ensure that the decline will not be substantial.

Springs Utilities has 125 megawatts of natural-gas generation: two 35 megawatt combustion turbines located at the Nixon site and three steam units totaling 55 megawatts at the Birdsall site. These units are used for peaking service.

Springs Utilities also has 33 megawatts of hydroelectric capacity. The Tesla hydroelectric unit is 28 megawatts and has a lower reservoir which enables its energy to be used primarily during peaking hours. The two Manitou hydroelectric units total 4 megawatts during the summer season, but reduced water flow during the winter season reduce the Manitou capacity to two megawatts. The Ruxton hydroelectric unit is one megawatt and operates only during the summer seasons.

Beginning in 2005, Springs Utilities will start developing master plans for the Drake Power Plant, Nixon Power Plant, and the Birdsall Power Plant. As these facilities age it becomes essential to assess their condition and plan accordingly for continued maintenance or their retirement if appropriate. The master plans will include future maintenance costs, assessment of future environmental controls, reliability and efficiency improvement considerations, and an evaluation of compatibility with future developments near these facilities. These master plans will assist in development of annual budgets for the plants and in long range planning for new electric generation resources.

Purchase Power Contracts

Springs Utilities' purchase power contracts are shown in Table 2.

Western - SLC. This federal purchase contract is 40 MW during the winter season and 8 MW during the summer season. Contract term is considered to continue indefinitely.

Western - LAO. This federal purchase contract is 57 MW during the winter season and 60 MW during the summer season. Contract term is considered to continue indefinitely.

Front Range Power. The Front Range Power (FRP) contract began in May 2003 and has a 20-year term. The initial capacity was 150 MW and it increases every summer and winter season as Springs Utilities' forecasted electric loads increase. The capacity purchase for each season is shown in Table 2.

Table 1: Generating Units

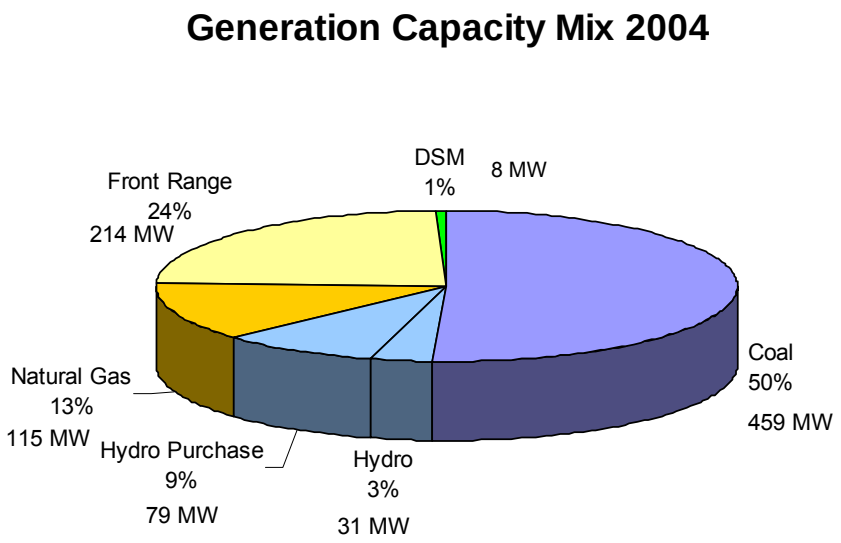
Generation:	Summer Capacity (MW)	Winter Capacity (MW)	Year Installed	Unit Type	Primary Fuel
Ruxton	1	0	1925	Conv. hydro	
Manitou 1	1	1	1939	Conv. hydro	
Manitou 2	1	1	1927	Conv. hydro	
Tesla Hydro	28	28	1997	Ponded hydro	
Birdsall 1	16	16	1953	Steam turbine	Natural gas
Birdsall 2	16	16	1954	Steam turbine	Natural gas
Birdsall 3	23	23	1957	Steam turbine	Natural gas
Drake 5	46	46	1962	Steam turbine	Coal
Drake 6	75	75	1968	Steam turbine	Coal
Drake 7	130	130	1974	Steam turbine	Coal
Nixon 1	208	208	1980	Steam turbine	Coal
Nixon 2	30	35	1999	Comb. turbine	Natural gas
Nixon 3	30	35	1999	Comb. turbine	Natural gas
Total generation	605	614			

Table 2: Purchase Power Contracts

Purchases:		Summer Capacity (MW)	Winter Capacity (MW)
Western - Loveland Area Office		60	57
Western - Salt Lake City Office		8	41
Front Range Power*	2003	150	168
	2004	214	197
	2005	244	225
	2006	272	251
	2007	299	279
	2008	327	308
	2009	357	337
	2010	393	365
	2011	422	392
	2012	447	417
	2013	460	442
	2014	460	470
	2015	460	480

*Summer capacity is from April to September, winter capacity is from October to March.

Figure 2 – Generation Capacity Mix



Transmission System

Springs Utilities owns and operates a local portion of the interconnected electric transmission system extending from Colorado to California and from parts of Mexico into Canada. Participation in this interconnection enhances overall reliability of the electric service and within the capabilities of the transmission system, enables us to import and export electric energy. The criteria governing the reliability of this interconnected system are developed and overseen by the North American Electric Reliability Council, and the Western Electricity Coordinating Council. In 2002 an in-house system expansion plan was developed to guide the enhancement of the electric transmission system through the 1250 megawatt load level. These enhancements were identified to adhere to the participation requirements of the interconnected system, and are now included in the long-range financial forecasts.

Springs Utilities recently took part in a long-range state-wide planning effort for the expansion of the electric transmission system in Colorado. Three scenarios were developed and studied. For each scenario, bulk power systems were designed and enhancements to the underlying load serving systems were preliminarily identified. Results of this study were presented to the Colorado Public Utilities Commission and the Office of Consumer's Counsel. Springs Utilities also participated in a joint planning study to identify the transmission system additions necessary to support the addition of a 750MW generation at the Comanche station in Pueblo. These state-wide planning efforts will form the basis for an update of the Transmission System Expansion Plan.

The interconnected transmission system delivers energy to the electric substations that provide service to Springs Utilities customers. These substations are typically planned more than 5 years in advance and are sited at the time properties are annexed into the City. The electric distribution lines originating from these substations are routed based on master plans as the properties are developed. The need for these distribution lines is driven by new or expanding customers. Planning for these facilities typically occurs from a few months to two years in advance.

Springs Utilities has been closely following Federal Energy Regulatory Commission (FERC) comments and rule-making and is assessing the impact of requirements that would be imposed on Springs Utilities for both electric and gas services. The comprehensive re-regulation of the wholesale electric markets to a standard market design will likely impact Springs Utilities' electric operation and planning including a 4 to 5 percent increase in electric system reserve margins. It could also result in a substantial transmission cost increase if Springs Utilities is required to join a Regional Transmission Organization (RTO) and pay a levelized RTO transmission rate.

Demand-Side Options

Demand-side resources affect customer consumption patterns. When customers consume less electricity, fewer generating units are required to serve system loads, and less fuel is burned.

A number of cost-effectiveness tests may be applied to demand-side programs to evaluate the programs from several different perspectives. These tests are described in the Analysis section of the DSM. However, not all demand-side programs need pass the cost-effectiveness tests for Springs Utilities to offer them. In many cases, demand-side management (DSM) programs constitute services which Springs Utilities' customers want so Springs Utilities offers them to meet customer needs. Springs Utilities also recognizes its responsibility, as a community-owned utility, for environmental stewardship.

Background

Demand Side Management (DSM) is the planning and implementation of utility activities designed to encourage customers to modify their level and pattern of electricity usage in ways that will produce desired changes in the utility's load shape.

DSM programs benefit both the utility and its customers. The utility benefits because DSM programs can be used as an alternative resource option to help produce a least cost plan in meeting customers' future electricity demand. Changes in the timing and magnitude of electricity demand can make more productive and cost-effective use of their generating resources. Customers benefit because they have more opportunities to better control energy use and utility bill costs through DSM.

Springs Utilities has been actively promoting DSM programs for many years. The current DSM efforts include energy efficiency rebates, energy audits, rate options and low income programs. As a further step in elevating its DSM efforts, Springs Utilities initiated a DSM Strategic Plan Project in 2004. The purpose of the Strategic Plan is to set a long term direction for defining Springs Utilities' role in shaping customer behavior regarding energy use, thus creating value for its citizen owners and contributing to the organization's core business.

DSM Strategic Options

Colorado Springs Utilities' DSM objectives are:

Contributing to improved system reliability

Helping mitigate price volatility and associated risks

Helping customers use electricity more efficiently

Positively contributing to environmental responsibilities

Two primary DSM strategies, load management and consumption reduction, are key to achieving the above four objectives in the short- and long-term. Load management can be achieved through peak clipping, peak shifting and valley filling, while consumption reduction can be attained through energy efficiency and conservation.

As the residential, commercial and industrial sectors are contributing approximately equal shares in sales and peak demand to the electricity system, DSM efforts should be focused on these market segments equally at this time.

A portfolio of program categories including incentives, rates, regulatory, market transformation, RD&D (Research, Development & Demonstration), customer education, and low income/community projects is suggested in order to achieve a balance among short and long term benefits, demand and energy reduction, firm and soft savings of the DSM objectives.

A list of 130 plus potential DSM program options have been identified and a set of evaluation criteria has also been established for the screening and selection of these programs into future DSM Work Plan. These include:

Technical Feasibility

Cost and cost-effectiveness

Amount of demand and energy savings

Environmental benefits

Level of effort

Ends and limitations

DSM Targets

A benchmarking exercise was done in order to establish practical DSM targets for Springs Utilities. Based on the DSM Strategic Plan Project study, several scenarios were prepared and their implications for demand and energy savings, costs, benefits, and rate impacts were evaluated. These scenario data were inputted into the EIRP for further resource integration analysis and finalization.

As DSM is considered an alternative resource option to supply side, DSM targets should be in line with the projected energy supply requirements in the future and integrated with the supply side options to produce a least-cost resource plan in an established planning horizon. Theoretically, the least-cost combination of supply side and demand side is at the level where the marginal cost of increasing either resource is equal. But we have to take into account the nature of DSM programs, which are mainly market driven, and their acceptance depends as much on customer value and behavior as on energy usage. In other words, DSM program results are relatively unpredictable, especially in a longer-term horizon. However the national data on program spending and savings provided us with useful information for target benchmarking purposes.

Based on benchmarking information as discussed above, we have modeled 6 scenarios with different levels of demand and energy savings for inclusion in the EIRP.

Scenario 1- Modest But Not Trivial

To reduce system energy and demand by 0.15% and 0.25% per year respectively (Projected energy savings for Springs Utilities' existing programs in year 2003 is 0.06% only).

Scenario 2 – Moderate

To reduce system energy and demand by 0.25% and 0.4% per year respectively.

Scenario 3 – Moderate to Aggressive

To reduce system energy and demand by 0.6% and 1.0% per year respectively.

Scenario 4 – Aggressive

To reduce system energy and demand by 1.0% and 1.5% per year respectively.

Scenario 5 – 3 years to reach Scenario 3 from Scenario 1

To increase system energy and demand savings progressively from 0.15% and 0.25% respectively in the first year, and to 0.6% and 1.0% respectively in the third year and the years thereafter.

Scenario 6 – 3 years to reach Scenario 4 from Scenario 1

To increase system energy and demand savings progressively from 0.15% and 0.25% respectively in the first year, and to 1.0% and 1.5% respectively in the third year and the years thereafter.

Other Major Assumptions for the Scenario Analysis

All dollar values are present value at 2005 prices.

The estimated benefits in each year reflect the avoided supply costs due to energy and demand savings achieved in that year. For the avoided costs assumptions, please refer to the Economic Impacts Evaluation section.

The average life time of a DSM measure is 10 years

Figure 3 – DSM Scenarios

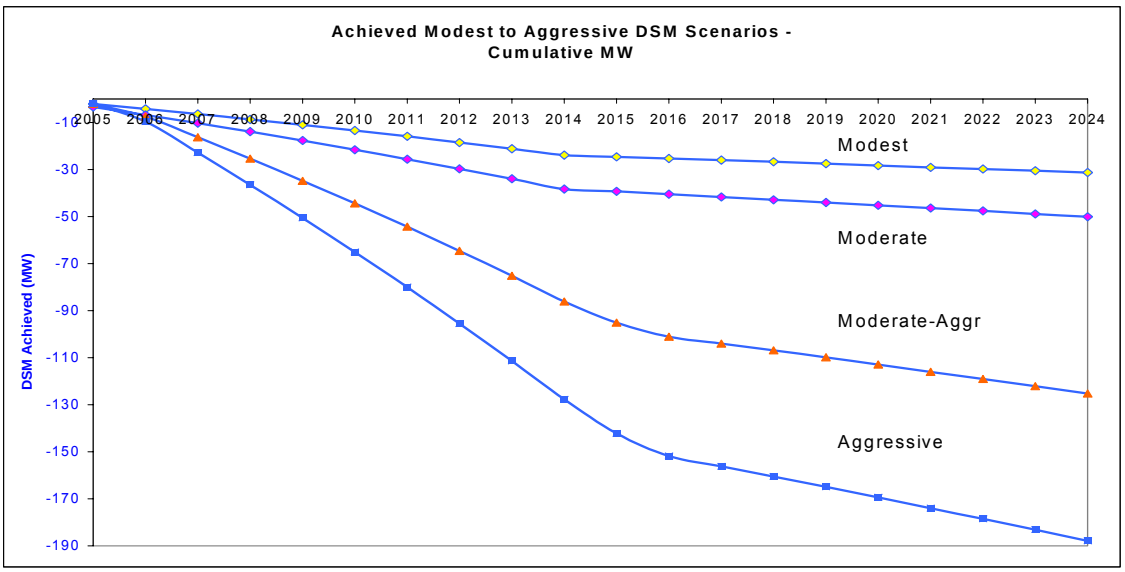


Table 3 presents the annual energy and demand savings for each of the scenarios. As an example, to achieve a moderate of 0.25% and 0.4% of system energy and demand reduction respectively, for example, the Scenario 2 will achieve the following for the period from 2005 - 2025:

Maximum cumulative demand impact: 50 MW

Maximum cumulative energy impact: 161 GWh

Estimated lifetime energy savings: 3,090 GWh

Estimated program costs: $47M

The next step following the DSM Strategic Options will be the preparation of a detailed DSM work options based on the direction, strategies, and guidelines established in this project.

Table 3: Cumulative GWh and MW Savings from DSM Scenarios

Cumulative GWh Savings

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
2005	7.1	11.8	28.3	47.2	7.1	7.1
2006	14.3	23.8	57.0	95.1	25.1	34.6
2007	21.6	36.0	86.3	143.9	54.4	83.4
2008	29.1	48.6	116.4	194.1	84.5	133.6
2009	36.8	61.5	147.3	245.5	115.4	185.0
2010	44.6	74.6	178.7	297.8	146.8	237.3
2011	52.6	88.0	210.8	351.4	178.9	290.9
2012	60.8	101.7	243.8	406.3	211.9	345.8
2013	69.2	115.8	277.6	462.6	245.7	402.1
2014	77.8	130.2	312.1	520.1	280.2	459.6
2015	79.5	133.0	318.9	531.4	308.2	511.0
2016	81.3	136.0	326.1	543.3	326.1	543.3
2017	83.2	139.1	333.5	555.6	333.5	555.6
2018	85.1	142.1	340.8	567.8	340.8	567.8
2019	87.0	145.1	348.1	580.1	348.1	580.1
2020	89.0	148.3	355.7	592.9	355.7	592.9
2021	91.0	151.5	363.4	605.7	363.4	605.7
2022	93.0	154.7	371.0	618.5	371.0	618.5
2023	95.0	157.9	378.6	631.3	378.6	631.3
2024	97.0	161.1	386.4	644.2	386.4	644.2

Cumulative MW Savings

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
2005	2.1	3.4	8.4	12.7	2.1	2.1
2006	4.2	6.8	17.0	25.6	7.5	9.6
2007	6.4	10.3	25.8	38.8	16.3	22.8
2008	8.7	13.9	34.9	52.5	25.4	36.5
2009	11.0	17.7	44.3	66.6	34.8	50.6
2010	13.4	21.6	53.9	81.1	44.4	65.1
2011	15.9	25.6	63.8	96.0	54.3	80.0
2012	18.5	29.7	74.1	111.5	64.6	95.5
2013	21.2	33.9	84.7	127.4	75.2	111.4
2014	23.9	38.3	95.6	143.7	86.1	127.7
2015	24.6	39.3	98.3	147.6	95.1	142.2
2016	25.3	40.5	101.1	151.8	101.1	151.8
2017	26.0	41.7	104.0	156.2	104.0	156.2
2018	26.7	42.9	106.9	160.5	106.9	160.5
2019	27.5	44.0	109.8	164.9	109.8	164.9
2020	28.3	45.2	112.9	169.4	112.9	169.4
2021	29.1	46.4	116.0	174.0	116.0	174.0
2022	29.8	47.6	119.0	178.5	119.0	178.5
2023	30.5	48.9	122.1	183.1	122.1	183.1
2024	31.3	50.1	125.2	187.9	125.2	187.9

Renewable Energy Options

Renewable energy is defined as an energy source that is replaced or replenished rapidly by natural processes. Renewable energy technologies have a lower environmental impact than conventional energy technologies. Examples include solar and wind power, hydropower, geothermal, and various types of biomass. As part of the renewable energy

options analysis, Springs Utilities will determine direction for renewable energy programs at customer facilities, at Springs Utilities facilities, and as community demonstration projects.

Renewable Energy Study

Springs Utilities began development of a renewable energy options assessment in 2004. The goal of this study was to review the range of renewable energy options and programs and to identify those that are the best fit with Springs Utilities. Based on the assessment, a number of renewable energy options could be implemented by Springs Utilities, as summarized in Table 4. Some of these are already being pursued by Springs Utilities, such as development of low-impact hydro along the water supply system and the purchase of wind power. In all, Springs Utilities could pursue various renewable resources and programs that, if fully deployed, could provide more than 100 megawatts (MW) of capacity and meet roughly 6.4% of projected sales in 2015 based on current projections. To achieve this amount of renewable generation, more than half would need to be from wind power. Thus, renewables are not likely to significantly impact the need for firm capacity, but can play a meaningful role in offsetting energy generation from fossil fuels.

Supply-Side Options

Wind Power

Wind power represents a favorable renewable energy resource potential for Springs Utilities and offers moderate cost with the prospect of improving economics in the future. However, integration of wind power into the mix is more complex than for any other renewable energy option. Integrating a wind power purchase is technically possible but several issues need to be addressed, including transmission access, availability, costs, regulation and impacts on operations. Because wind power is intermittent and non-dispatchable, if Springs Utilities were to add wind to its resource supply mix, it would need to increase the cycling of its low-cost coal units in the short term since much of the wind power output is expected to occur during off-peak periods;[1] potentially plan for more ancillary services to manage the real-time variation in wind power output; and continue to plan for capacity in the long term assuming that wind cannot contribute in a significant way to firm capacity.

[1] In the medium-long term, this issue will abate as load grows and natural gas is more often on the margin. This will improve the relative economics of wind since it will be displacing more gas-fired generation, which is more costly than coal-fire generation.

The Federal production tax credit (PTC), which provides a 1.8 cents/kWh subsidy, was renewed thru 2005, and as a result, a large amount of wind is scheduled to be developed. Wind industry experts expect the PTC to be renewed thru 2006 and beyond, but the current uncertainty surrounding the PTC only adds to the complications in making decisions on a wind power purchase. The viability of Springs Utilities constructing its own wind farm will depend on the ability to find a suitable site, given the relatively poor wind resources in and around Colorado Springs as compared to other parts of Colorado. The farther away Springs Utilities must go to find a suitable site the greater the transmissions costs, which offsets the economic advantages of leveraging out low cost of capital relative to the wind purchase option. Springs Utilities is currently collecting wind data to assess the viability of wind power on parts of its property.

Hydroelectric Power

The low-impact hydro option shows favorable economic and essentially zero environmental impact, and could potentially add a total of 15MW (at five sites – all close to electric transmission) to the resource supply mix by 2011. Although hydropower is not fully dispatchable, its output profile will be fairly predictable as it will be based on water demand which will minimize the grid integration issues. Springs Utilities can also draw upon its extensive experience with small hydro to implement this resource.

Biomass

Woody biomass represents a potentially important opportunity for Colorado Springs but also presents some unique challenges. With the expectation of forest thinning activities to address the wildfire threat and increase water yields, enough biomass could be available to generate relatively large amounts of renewable energy compared to some of the other options evaluated in this study. Unlike most other renewable energy options, biomass power can achieve very high capacity factors (85-95%). Thus, per megawatt, biomass power can produce roughly 3-4 times the energy as a wind farm and up to 5 times that of photovoltaics. The trade-off is that biomass combustion in a power plant does produce emissions, and Springs Utilities must also deal with the issues of fuel price and fuel availability. Specifically, if fuel became too expensive or unavailable, it could lead to a stranded investment if the biomass plant could not operate. The other main benefit of using forest thinning for power production is that the alternative would be to burn the biomass in the field, which would generate significant air emissions.

The two woody biomass options for Springs Utilities are to co-fire the biomass in the existing Nixon power plant or to build a separate, dedicated biomass power plant. Co-firing offers the potential for much better economics, but a range of technical and operations issues related to the retrofit of the Nixon plant must be carefully addressed in a detailed engineering study before this option can be declared feasible. A separate, stand-alone biomass plant would bypass these issues but would generate less electricity per unit of fuel due to a higher heat rate, and would require a higher up-front capital investment, however, could include other biomass, alternate fuels as well as traditional fuels.

Customer-Side Options

Photovoltaics

Customer-sited photovoltaics (PV) could contribute to overall renewable energy generation, but to do so will require Springs Utilities to implement a focused program that would include rebates and incentives to offset the high initial cost of PV. Regardless of whether Springs Utilities chooses to offer rebates, any effort to increase customer-side renewables use would need to include a net metering program and standard interconnection agreements. Springs Utilities is currently evaluating a customer-side PV program.

Geoexchange Heat Pumps

Geoexchange heat pumps can slow peak demand growth through high efficiency cooling, and they can improve Springs Utilities' system load factor. This technology utilizes the static temperature under the Earth's surface, yet this option is more closely associated with energy efficiency/DSM than renewables. Springs Utilities could promote geo-exchange heat pumps under its DSM program.

Table 4: Summary of Leading Renewable Energy Options

Leading Renewable Energy Options for Colorado Springs Utilities				
Technology		**Key Benefits**	**Key Development Issues/Hurdles**	**Comments**
Supply-Side Options	**Wind Power Purchase**	• Moderate cost • Most significant resource potential of all the options identified	• Availability and cost of transmission • Integration into utilities mix, given current supply-demand balance	• Renewal of Federal production tax credit is uncertain, but considered critical.
	Utilities Owned Wind Farm	• Moderate cost • Avoids transmission costs	• Resource potential is very limited within service territory	• May require partnerships to develop suitable site outside of service territory
	Low-Impact Hydro	• Low cost • No environmental impact	• Plan for sufficient lead time for FERC licensing process for larger unit	• Five attractive sites with access to transmission identified along water supply system • Initial projects under development
	Woody Biomass Co-firing at the Nixon Coal Plant	• Low cost • Environmental benefits through direct displacement of coal and beneficial use of forest thinnings	• Greatest technology risk of all options • Could negatively impact Nixon plant performance/reliability	• Detailed engineering study needed to fully evaluate this option • Most complex technical issues compared to all other options
	Stand-alone 100% Woody Biomass	• Environmental benefits through beneficial use of forest thinnings	• Higher total cost than co-firing • Risk of stranded investment if fuel becomes unavailable or too expensive	• Mature, low risk technology • Can be developed as alternative to co-firing
	Biogas cogen at Clear Spring Ranch	• Low-moderate cost • Utilizes "free" fuel (by-product of sewage sludge treatment)	• Removal of contaminants from gas to maintain equipment life & performance • Permitting, if net emissions increase	• 50% of biogas is currently burned off in a flare
Customer-Side Options	**Photovoltaics**	• High visibility • Output is fairly co-incident with peak demand	• Would require a targeted program with rebates to achieve market penetration beyond a handful of "early adopters"	• Despite current high costs, costs are expected to decrease over the coming years
	Geo-exchange heat pumps	• Can slow peak demand growth through high efficiency cooling • Improves Utilities' system load factor	• Would require a targeted program with rebates to achieve accelerated market penetration	• This option is more closely associated with energy efficiency/DSM than renewables.

Renewable Energy Summary

An important aspect of the overall renewable energy analysis was to conduct customer research and solicit stakeholder input into the role of renewables. Customer research related to the renewable energy assessment was addressed in the Electric Integrated Resource Plan (EIRP). A stakeholder input process was conducted and involved several activities, including public meetings, two statistically-valid customer surveys, and a five question survey offered under the Ambassador Program and at the Utilities website. Other input and public interface occurred at the three EIRP public meetings, via a presentation to the Utilities Policy Advisory Committee (UPAC) and through bi-weekly Technical Advisory Group (TAG)[2] meetings.

Another aspect of the study revolved around the issue of Renewable Energy Certificates (RECs)[3]. RECs are emerging as a mechanism for valuing, buying and selling the attributes of renewable energy. RECs can be bought and sold independently of the power generated and are easily tracked, so they can greatly simplify the process of defining the attributes of the power sold to end-users. Therefore, they can create new opportunities for supporting the development of renewables locally, regionally, and nationally. RECs present both buy and sell opportunities for Springs Utilities. Instead of buying *bundled renewable energy* (energy plus attributes) from a third party to meet its renewable energy goals, Utilities could purchase attributes only (in the form of RECs) and meet its power obligations via traditional options. Depending on the circumstances, this could be a lower cost option for meeting renewable energy goals.

Ultimately, the approach to the utilization of renewable energy adopted by Utilities may include a mix of buying, selling, and retention of renewable energy and RECs. A variety of other considerations, such as whether or not Springs Utilities wants to support local renewable energy projects versus purchase RECs from out of state, will influence the REC strategy. The higher risk associated with RECs (their price is less predictable than a renewable energy power purchase) also needs to be considered.

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[2] The TAG is a volunteer group that is comprised of DSM and renewable energy experts.

[3] Also called green tags, renewable energy credits, tradable renewable electricity certificates (T-RECs), tradable renewable certificates (TRCs), and green tickets.

Electric Load Forecast and System Reserves

Electric Load Forecast

The 20-year electric load forecast used in this planning process was developed by an outside consultant and distributed to Springs Utilities staff during the spring of 2004. The electric forecasting model needed to be updated because Springs Utilities was re-evaluating its need for new capacity. The economy had changed significantly since the forecast was originally prepared. The general approach used in the update was the same as the approach used in the original model development in 2002. The model uses econometric equations of sales or use per customer to develop forecasts. For the update, the equations developed in the original effort were re-estimated using updated data. In most cases, the statistical properties for the variables in the updated equations were still acceptable. For some customer classes, variables in the equations became insignificant or inapplicable in the update. In these instances, the equations were analyzed in more detail.

A summer peak demand forecasting equation was also developed in the update because of the importance of the resource planning implications of the new forecast. The peak demand equation relates weather, monthly residential sales and dummy variables to peak. An equation for winter peak demand was not developed, in part due to limited numbers of cold days in recent years. A load factor approach was used to forecast winter peak demand based on the average load factor from 1992 to 2000. The total sales projected in the model are converted to electric load assuming 4% losses.

A revised electric load forecast (Table 5) was published in October 2004 to reflect the exclusion of the City of Fountain load beginning in July 2005. The new forecast maintains the same general economic assumptions.

The electric load forecast incorporates Springs Utilities current level of demand-side management program staffing and expenditures and assumes that Springs Utilities' present demand-side management programs, or similar programs, will be continued into the future. Load reductions from these programs are not explicitly shown, but rather are reflected in the seasonal peak demand and the annual system energy figures contained in the forecast.

Reserve Requirements

Historically, Springs Utilities was required by the Rocky Mountain Reserve Group to maintain a minimum of 45 MW of reserve capacity during all hours of operation. Springs Utilities operators require an additional 20 MW of online capacity for system regulation (responding to rapid increases in system load). So a minimum of 65 MW of operating reserves was maintained. Beginning in 2005, Springs Utilities will be maintaining a 12% reserve margin.

There are several risk factors which make it prudent for utilities to maintain more than the minimum required operating reserves and a percentage of annual peak demand over the long term. Several years are required to permit and build thermal generating units, or to create and put into place demand-side management programs that can reduce load growth. Delays can be experienced as generating units are built. Penetration rates and load reductions from demand-side programs are problematic. Over a period of a few years, regional reserve margins may decline as loads grow faster than anticipated, or as planned resource additions are delayed. When these risk events occur, the result may be power shortages, price spikes and substantially higher purchase costs in regional power markets, and possibly, brownouts or blackouts.

To assure ability to serve native electric loads, utilities have traditionally maintained substantially higher reserve margins than those required for hour-to-hour operation of their electric systems. Many utilities maintain planning reserves equal to 12 to 22 percent of annual peak demand. The National Electric Reliability Council (NERC) has published suggested guidelines for higher long-term planning reserve levels, but these guidelines are sometimes ambiguous and apply to regions rather than individual utilities. Also, they have had no enforcement provisions, so compliance by electric utilities and their regulating bodies has been largely voluntary.

In response to the trend toward deregulation, and following the reliability problems that California experienced during 2001, NERC is now in the process of developing reserve margin standards which will be mandatory. Utilities must comply. These standards are expected to be finalized and published by the end of 2005, and will likely take effect several years later. Until then, long-term planning reserve requirements remain uncertain and voluntary.

System Reserves

Table 6 shows Springs Utilities resources on a season-by-season basis. The resource base remains constant except for a decrease in Western capacity in 2008. Also, the FRP contract increases each season to approximately match Springs Utilities forecasted load increases.

Table 6 also compares Springs Utilities' forecasted seasonal peak electric demands to its resources and calculates forecasted reserve margins for each season. Reserve margins are calculated in megawatts and in percent of seasonal peak demand.

Springs Utilities has ample operating reserves through the winter 2009-2010. Which remain above 12% reserve through the summer of 2012.

Table 5: Electric Load Forecast

Year	System energy			Winter peak			Summer peak		
	Level (GWh)	Change (%)	Five year avg. change (%)	Level (MW)	Change (%)	Five year avg. change (%)	Level (MW)	Change (%)	Five year avg. change (%)
1991	*3,122*	*2.4*	*3.0*	*541*	*4.7*	*2.4*	*499*	*6.3*	*2.8*
1992	*3,184*	*2.0*	*2.1*	*537*	*(0.8)*	*1.5*	*488*	*(2.2)*	*0.9*
1993	*3,289*	*3.3*	*2.2*	*546*	*1.8*	*2.1*	*510*	*4.4*	*2.1*
1994	*3,430*	*4.3*	*2.6*	*588*	*7.6*	*2.9*	*534*	*4.7*	*2.9*
1995	*3,576*	*4.3*	*3.2*	*609*	*3.6*	*3.3*	*576*	*7.9*	*4.2*
1996	*3,795*	*6.1*	*4.0*	*642*	*5.4*	*3.5*	*585*	*1.6*	*3.2*
1997	*3,952*	*4.1*	*4.4*	*665*	*3.6*	*4.4*	*626*	*7.0*	*5.1*
1998	*4,088*	*3.4*	*4.4*	*676*	*1.7*	*4.3*	*658*	*5.1*	*5.2*
1999	*4,219*	*3.2*	*4.2*	*696*	*3.0*	*3.4*	*681*	*3.5*	*5.0*
2000	*4,473*	*6.0*	*4.6*	*738*	*6.0*	*3.9*	*732*	*7.5*	*4.9*
2001	*4,596*	*2.7*	*3.9*	*709*	*(3.9)*	*2.0*	*745*	*1.8*	*5.0*
2002	*4,636*	*0.9*	*3.2*	*733*	*3.4*	*2.0*	*784*	*5.2*	*4.6*
2003	*4,628*	*(0.2)*	*2.5*	*751*	*2.5*	*2.1*	*825*	*5.2*	*4.6*
2004	4,650	0.5	2.0	777	3.5	2.2	815	(1.3)	3.6
2005	4,618	(0.7)	0.6	760	(2.3)	0.6	810	(0.6)	2.0
2006	4,580	(0.8)	(0.1)	773	1.8	1.8	821	1.3	2.0
2007	4,661	1.8	0.1	791	2.3	1.5	842	2.6	1.4
2008	4,798	2.9	0.7	819	3.5	1.7	871	3.5	1.1
2009	4,911	2.4	1.1	842	2.9	1.6	899	3.2	2.0
2010	4,994	1.7	1.6	861	2.2	2.5	923	2.7	2.7
2011	5,107	2.3	2.2	885	2.8	2.7	950	2.9	3.0
2012	5,235	2.5	2.3	912	3.0	2.9	986	3.8	3.2
2013	5,360	2.4	2.2	939	2.9	2.8	1,015	2.9	3.1
2014	5,471	2.1	2.2	964	2.6	2.7	1,043	2.7	3.0
2015	5,570	1.8	2.2	986	2.3	2.8	1,061	1.7	2.8
2016	5,688	2.1	2.2	1,013	2.7	2.7	1,090	2.8	2.8
2017	5,808	2.1	2.1	1,040	2.6	2.7	1,120	2.7	2.6
2018	5,931	2.1	2.0	1,067	2.6	2.6	1,151	2.7	2.5
2019	6,055	2.1	2.0	1,095	2.7	2.6	1,181	2.7	2.5
2020	6,177	2.0	2.1	1,123	2.5	2.6	1,213	2.7	2.7
2021	6,302	2.0	2.1	1,152	2.6	2.6	1,245	2.6	2.7
2022	6,426	2.0	2.0	1,181	2.6	2.6	1,277	2.6	2.7
2023	6,549	1.9	2.0	1,210	2.4	2.6	1,311	2.6	2.6
2024	6,676	1.9	2.0	1,241	2.5	2.5	1,344	2.6	2.6

Table 6: Electric Resources and Reserve Margins (MW)

Reserve Margins MW

Generation	05 S	05-06 W	06 S	06-07 W	07 S	07-08 W	08 S	08-09 W	09 S	09-10 W
Drake 5	46	46	46	46	46	46	44	44	44	44
Drake 6	75	75	75	75	75	75	75	75	73	73
Drake 7	130	130	130	130	130	130	130	130	130	130
Nixon 1	208	208	208	208	208	208	208	208	208	208
Nixon 2	30	35	30	35	30	35	30	35	30	35
Nixon 3	30	35	30	35	30	35	30	35	30	35
Birdsall 1	16	16	16	16	16	16	16	16	16	16
Birdsall 2	16	16	16	16	16	16	16	16	16	16
Birdsall 3	23	23	23	23	23	23	23	23	23	23
Ruxton & Manitou Hydro	3	2	3	2	3	2	3	2	3	2
Tesla Hydro	28	28	28	28	28	28	28	28	28	28
Total generation	605	614	605	614	605	614	603	612	601	610

Purchases	05 S	05-06 W	06 S	06-07 W	07 S	07-08 W	08 S	08-09 W	09 S	09-10 W
Front Range Power Contract	244	225	272	251	299	279	327	308	357	337
WAPA-SLC low hydro conditions	8	41	8	41	8	41	8	41	8	41
WAPA-LAO	60	57	60	57	60	57	60	57	60	57
Wind Purchase (100% firm)	1	1	1	1	1	1	1	1	1	1
Total Purchases	313	324	341	350	368	378	396	407	426	436

Reserve Calculation	05 S	05-06 W	06 S	06-07 W	07 S	07-08 W	08 S	08-09 W	09 S	09-10 W
Generation	605	614	605	614	605	614	603	612	601	610
Purchases	313	324	341	350	368	378	396	407	426	436
Total Resources	918	938	946	964	973	992	999	1019	1027	1046
Peak Demand	810	773	821	791	842	819	871	842	899	861
Calculated reserve	108	165	125	173	131	173	128	177	128	185
Calculated reserve (%)	13%	21%	15%	22%	16%	21%	15%	21%	14%	21%

Notes: Low hydro conditions have affected power deliveries from WAPA.

WAPA SLC was 15 MW in the summer 2005 and 60 MW in the winter.

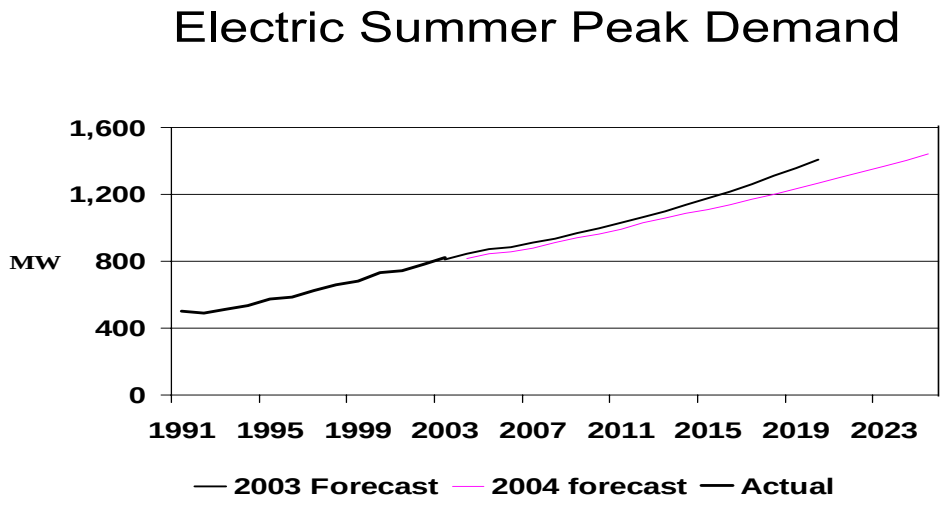
WAPA LAO was 60 MW in the summer 2005 and 57 MW in the winter.

Reduced WAPA SLC could drop from 8 to 7 MW starting summer 2006 and from 41 to 16 MW winter.

Reduced WAPA LAO could drop from 60 to 47 MW starting summer 2006, and from 57 to 47 MW winter

04/21/2005

Figure 4 – Electric Summer Peak Forecast



Resource Options

Springs Utilities evaluated six conventional supply-side resource options, four renewable supply-side resource options, and four demand-side resource options. The renewable and demand-side options were developed from the studies discussed above.

Conventional Supply-Side Resource Options

Springs Utilities evaluated six thermal resource options.

45 MW Combustion Turbine. This is a GE LM6000 aero derivative combustion turbine. Firm gas transportation would be purchased by Springs Utilities. Capital and operating costs were provided by an engineering-services company.

70 MW Combustion Turbine. This is a GE Frame 7EA combustion turbine. Firm gas transportation would be purchased by Springs Utilities. Capital and operating costs were provided by an engineering-services company.

150 MW Combustion Turbine. This is a GE Frame 7FA combustion turbine. Firm gas transportation would be purchased by Springs Utilities. Capital and operating costs were provided by an engineering-services company.

250 MW Combined Cycle Unit. This is a GE Frame 7FA combustion turbine with a heat recovery steam generator and a steam turbine. The unit is built in two phases: First, the combustion turbine is built. One or more years later, the steam components are added. Capital cost is higher for this option than for the combined cycle unit that is not phased. Firm gas transportation would be purchased by Springs Utilities. Capital and operating costs were provided by an engineering-services company.

150 MW of the Colorado Generating Project. This would be a joint project with Tri-State G&T and other utilities in Colorado. The project would not be complete before 2012. Springs Utilities' take of this project would be 150 MW. Capital and operating costs were provided by an engineering-services company.

150 MW Pulverized Coal Unit. This option is available only after the Colorado Generating Project has been installed. It would be a separate coal unit, either developed with other partners or 150 MW purchased from another company that owns a coal resource.

Springs Utilities evaluated Integrated Gasification Combined Cycle units (IGCC) in November 2003. The EIRP eliminated this technology from further consideration based on several factors that included: (a) few IGCC demonstration plants have been developed, (b) capital costs are in the range or above conventional coal plants, and (c) uncertainty in performance availability of IGCC demonstration plants.

Renewable Supply-Side Resource Options

Springs Utilities evaluated four renewable resource options. Table 7 presents a summary of the operating characteristics and costs assumed.

Hydroelectric Units. Springs Utilities staff screened possible opportunities to add hydroelectric generating capacity to the Springs Utilities water collection and distribution system. Preliminary capital costs and energy generation figures have been developed, but site-specific costs, such as cost to connect to the transmission system, are undeveloped. Substantially more engineering work and economic analysis needs to be done, but the data from the screening study are used to evaluate whether these generating units could be a cost-effective resource addition.

Wind Energy. This study evaluated four different blocks of wind power, 50 MW, 25 MW, 10 MW and a 4 MW. Unlike the Green Power program, in which customers voluntarily contribute a premium of three cents per kilowatt-hour to offset the higher cost of wind energy, this evaluation of wind power assumes that the resource is brought directly into the Springs Utilities system and the costs are born by all Springs Utilities customers. The wind energy costs assumed were a combination of the results from the Renewable Energy Study and bids received through two market inquiries by Springs Utilities in 2004. Wind energy is a non-firm resource. Current reliability guidelines issued by the various NERC reliability councils do not allow wind power to be treated as a firm resource. For this reason, wind power is modeled with 15% of the capacity considered firm.

Biomass. For the EIRP, Springs Utilities only evaluated the stand-alone biomass option discussed in the previous section. The operational risks of co-firing at Nixon were considered too great to consider this option in the near-term. The average heat rate of this unit was modeled as 16,000 MMBtu/MWh and the cost of fuel was assumed to be around $2.00/MMBtu.

Photovoltaics. While photovoltaics can be considered a customer-side resource, they were modeled in the EIRP as a supply-side resource. For simplicity, the business-sited 250 kW units were used for the analysis. Like the wind resource, PV is not fully dispatchable, its highest output most likely coincides with summer peak hours and 75% of their capacity is considered firm. While the cost of PV is currently very high ($6000/kw), this drops considerably over time ($3590/kw in 2015).

Table 7: Renewable Supply-Side Options and Costs (all dollars in 2005$)

	Hydro		Wind					
	Site 1&2	Site 4	Tesla 2	50 MW	25 MW	10 MW	Biomass	PV
Maximum Capacity (MW)	0.88	2.11	10	50	25	10	6.5	0.25
Annual Energy (MWh)	5,761	7,618	30,000	175,200	87,600	35,040	48,399	372
Capacity Factor (%)	75%	41%	34%	40%	40%	40%	85%	17%
Variable Costs ($/MWh)	$0.00	$0.00	$0.00	$44.15	$57.39	$60.90	$2.50	$0.00
Fixed Costs ($/kw-yr)	$46	$20	$27	$0	$0	$0	$125	$12
Installed Cost ($/kw)	$1,463	$1,349	$1,366	$0	$0	$0	$2,000	$6,000

Demand-Side Resource Options

Of the six demand-side targets discussed above, Springs Utilities selected four to use in the EIRP analysis. Scenarios 1, 2, 5, and 6 were used in the analysis. Scenarios 3 and 5 were identical targets except that Scenario 5 allowed three years to ramp up. Springs Utilities determined that a certain amount of ramping time was deemed necessary to achieve these levels of reduction. Scenarios 4 and 6 also had the same targets, but Scenario 6 had a three year ramp up time as well.

The DSM targets were modeled as load modifiers. For each of the scenarios, the base case load energy and peaks were modified to achieve the reductions reported in Table 3. The DSM costs for each of the scenarios were added to the total resource cost.

Evaluation of Resource Options

Evaluation Methodology

Electric system-simulation software is used to model a large number of possible resource expansion plans. The software calculates annual capital and operating costs, and annual emissions for each resource plan. For resource plans which include the demand side management scenarios, electric loads are reduced and comparable amounts of supply-side resources are eliminated from the resource plans.

Evaluation for each resource plan includes three tests.

Total Supply Cost Test. This asks whether it is less costly for the community to invest in renewable resources, spend money on DSM programs, or to build and operate new generating units.

The Per Unit Supply Cost Test looks at Springs Utilities' costs and the price it must charge to recover costs. For resource plans with higher DSM targets, capital and operating expenditures for new generating units are reduced because loads are reduced. Sales revenues are also reduced. The question is whether Springs Utilities' savings in capital and operating costs are sufficient to offset the lost revenues. If not, then Springs Utilities must increase its prices to recover a portion of the lost revenues, and the resource plan fails the Per Unit Supply Cost Test.

Customer Preference Test. This is a qualitative test. From our public process, certain objectives have been highlighted by our customers. There was a desire to pursue more renewable resources in our portfolio and to encourage more demand-side management adaptation. The trade-off between costs and pursuing these objectives was evaluated by the Springs Utilities staff.

After the resource plans are evaluated using these criteria, further evaluation is made using all of the Evaluation Criteria established for this planning process. The results of this overall evaluation are found at the end of this section.

EIRP Scenarios

Springs Utilities has developed the EIRP to meet the needs of our service area through the year 2024. As part of the EIRP, Springs Utilities utilized a mix of coal, gas, and hydro-powered generation, long-term contracts, spot market purchases, renewable energy, demand side management, and planned future resources to ensure reliable services at the lowest costs. Because all of the electric systems in the western United States are interconnected, Springs Utilities is also dependent on other utilities having adequate supplies. The region has transmission constraints and when it is short of generating resources Springs Utilities may have problems even after securing adequate supplies. Therefore, Springs Utilities strives to minimize reliance on external resources and transmission of the western electric system to meet the electric needs of our customers.

Existing resources are adequate to meet current customer demands and reliability requirements, however new resources are needed to meet forecasted demand for electricity. Therefore, to meet this need the EIRP considers various criteria and recommends a portfolio of resources that provides a balanced and responsible low-cost plan that meets reliability requirements, is fiscally sound, promotes environmental stewardship, is flexible, and balances risk and cost.

Evaluations for the ongoing EIRP process identified events which have reduced the electric load forecast, making it necessary to defer significant new electric resources until the 2011-2015 timeframe. These events include the economic downturn, changing electric load and load patterns, and outlook of the semiconductor-manufacturing sector with some customer load not increasing as initially forecasted.

Recent results of the EIRP show that Springs Utilities currently has adequate electric generation supplies for the next ten years. Springs Utilities is primarily dependent on coal generation with growing reliance on natural gas generation, until new generating capacity is required in 2014.

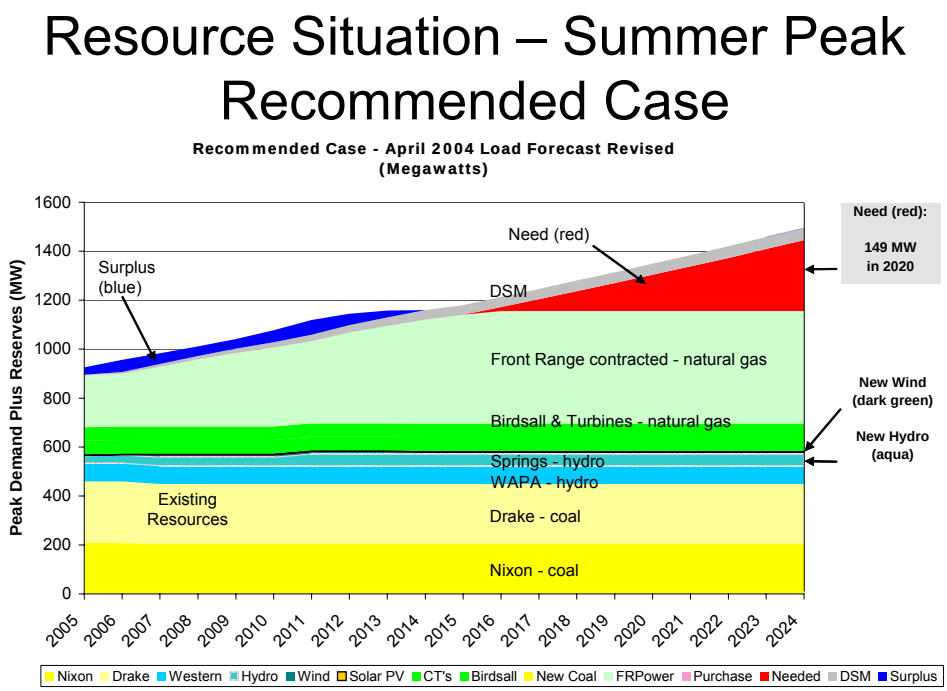
The EIRP analysis evaluated 20 scenario options combining current DSM plus the four Demand-Side Scenarios mentioned above. It also included combinations of current renewable levels and three additional levels of renewable resources consistent with current capacity needs. Table 8 presents the twenty scenarios run as part of this EIRP process. The columns across the top represent increasing levels of Demand-side management being implemented, from the current DSM levels to the Aggressive DSM Scenario. The rows down the side represent increasing amounts of renewables being added to the system. The status quo has existing renewable energy from 28 MW Tesla, small hydro units and a 1 MW wind purchase. Increasing amounts of wind, photovoltaics, and biomass are added from the low to high renewable scenarios. The individual grid cells identify when and at what size resources are added to the system. For example, under a status quo renewable scenario and Medium DSM, no new resources are needed before 2016. By adding a high level of renewable resources under Medium DSM, no new conventional technologies are needed before 2017.

Table 8: Twenty EIRP Scenario Grid Options

		DEMAND SIDE MANAGEMENT				
		Current DSM	**Modest**	**Moderate**	**Moderate to Aggressive**	**Aggressive**
RENEWABLES	**Status Quo**	Coal-2014 Coal-2019 Coal-2023	Coal-2015 Coal-2020 Coal-2024	Coal-2016 Coal-2020	Coal-2018 Coal-2023	Coal-2020
	Low	*3 MW Small Hydro-2006* *5MW Wind-2006* Coal-2014 Coal-2019 Coal-2023	*3 MW Small Hydro-2006* *5MW Wind-2006* Coal-2015 Coal-2020 Coal-2024	*3 MW Small Hydro-2006* *5MW Wind-2006* Coal-2016 Coal-2021	*3 MW Small Hydro-2006* *5MW Wind-2006* Coal-2018 Coal-2023	*3 MW Small Hydro-2006* *5MW Wind-2006* Coal-2020
	Medium	*3MW Small Hydro-2006* *10MW Wind-2006* *13MW Med Hydro-2011* Coal-2015 Coal-2019 Coal-2024	*3MW Small Hydro-2006* *10MW Wind-2006* *13MW Med Hydro-2011* Coal-2016 Coal-2020	***3MW Small Hydro-2006*** ***10MW Wind-2006*** ***13MW Med Hydro-2011*** **Coal-2016** **Coal-2021**	*3MW Small Hydro-2006* *10MW Wind-2006* *13MW Med Hydro-2011* Coal-2019 Coal-2023	*3MW Small Hydro-2006* *10MW Wind-2006* *13MW Med Hydro-2011* Coal-2021
	High	*3MW Small Hydro-2006* *25MW Wind-2006* *1MW PV-2007* *7MW Biomass-2011* *13MW Med Hydro-2011* *1MW PV-2011* Coal-2015 Coal-2020 Gas-2024	*3MW Small Hydro-2006* *25MW Wind-2006* *1MW PV-2007* *7MW Biomass-2011* *13MW Med Hydro-2011* *1MW PV-2011* Coal-2016 Coal-2021	*3MW Small Hydro-2006* *25MW Wind-2006* *1MW PV-2007* *7MW Biomass-2011* *13MW Med Hydro-2011* *1MW PV-2011* Coal-2017 Coal-2021	*3MW Small Hydro-2006* *25MW Wind-2006* *1MW PV-2007* *7MW Biomass-2011* *13MW Med Hydro-2011* *1MW PV-2011* Coal-2019 Coal-2023	*3MW Small Hydro-2006* *25MW Wind-2006* *1MW PV-2007* *7MW Biomass-2011* *13MW Med Hydro-2011* *1MW PV-2011* Coal-2021

The public preference feedback in the public participation process varied from general preference for low rates, to partial preference for aggressive DSM, and partial preference for high renewable energy. This was used as a test to balance customer needs. Also, 65% of the residential customers wanted to include renewable energy in the supply mix, even if it costs more than other supply options. Residential customers felt it was of equal importance to invest in renewable sources as to develop programs that help customers use less electricity (DSM).

Figure 5 – Resource Situation Recommended Case



The EIRP computer optimization results show that coal generation resulted in the best long-term option, and participation in the Colorado Power Project (CPP) is currently the best opportunity. Both the CPP and the pulverized coal generation were the least cost resource additions in 2014, with lower cost than other technologies such as natural gas fueled generation. The CPP capital costs plus estimated transmission costs would be similar or less than a pulverized coal unit located at the Nixon Power Plant. The scenario with the CPP is $31 million lower in present worth than a pulverized coal unit in 2014, excluding transmission costs.

Analysis and Findings

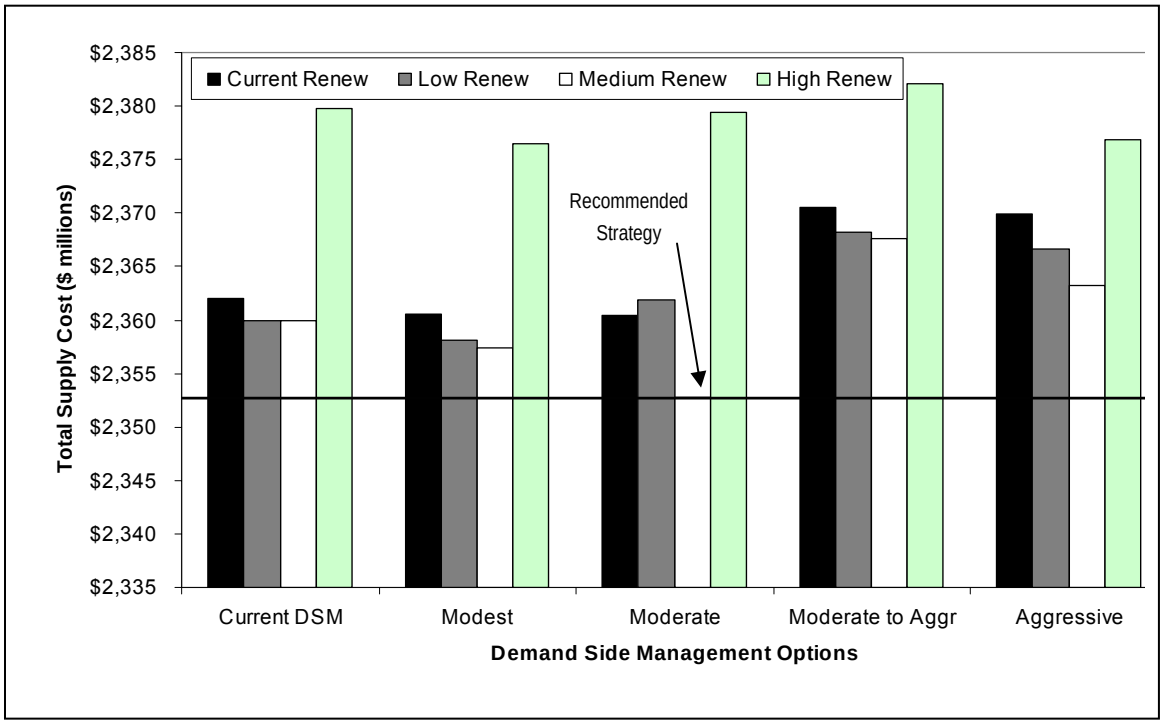
This section presents results of modeling analysis. Dollar figures quoted represent the cumulative present worth of dollar savings.

Total Supply Cost Test

The total supply cost for the utility includes all the costs of generation, fuel purchases, power purchases, variable operating costs, fuel transportation charges, Front Range capacity payments, and new capital expenses. It does not include other administrative overheads costs that would be included in the final rate base.

Figure 1 presents a comparison of the total supply costs under each scenario. The supply costs decrease as the level of DSM increases, until it reaches the Moderate to Aggressive DSM scenario. At higher DSM scenarios, the total cost increases. The scenario with the lowest total supply costs are the Medium Renewable Scenario under the Moderate DSM Scenario.

Figure 6: Total Supply Cost Comparison

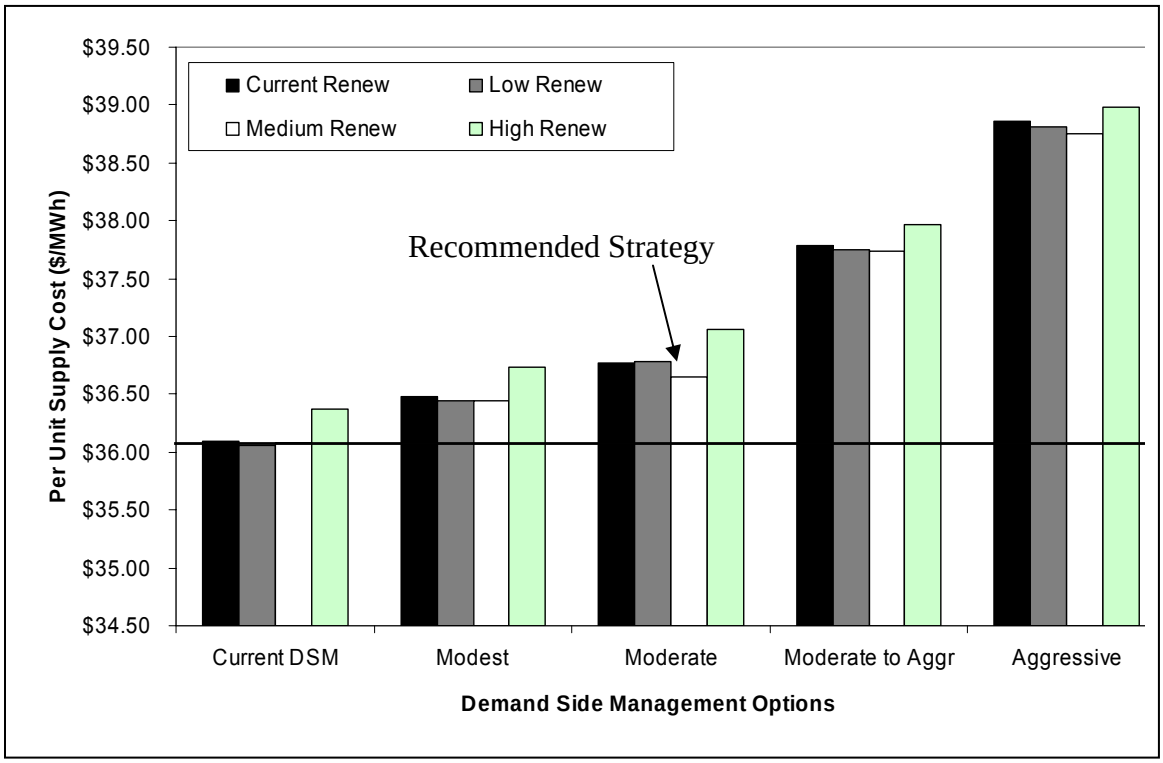


Per Unit Supply Cost Test

The per unit supply cost is calculated by dividing the total supply cost described above by the total load. This gives us a rate in terms of $/MWh cost that would be seen by our customers. This is not the actual rate because all of the additional administrative and overhead costs are not included in the total supply cost, but can be an indicator of cost trends on a per unit basis.

Figure 2 presents a comparison of the per unit supply costs for each scenario. In this graph the per unit supply costs increase steadily as higher DSM reductions are achieved. The lowest per unit supply costs are under the current DSM at Current, Low and Medium Levels of Renewables.

Figure 7: Per Unit Supply Cost Comparison



Emissions

Emissions reduction is an important part of the evaluation process as was noted in the public participation process. For the most part, the rate of emission reduction under the twenty scenarios does not change significantly. Figures 3 through 6 present comparisons of the emission rates for four pollutants, SO_2, NO_X, Mercury, and CO_2.

Figure 8: Comparison of SO2 Emission Rates

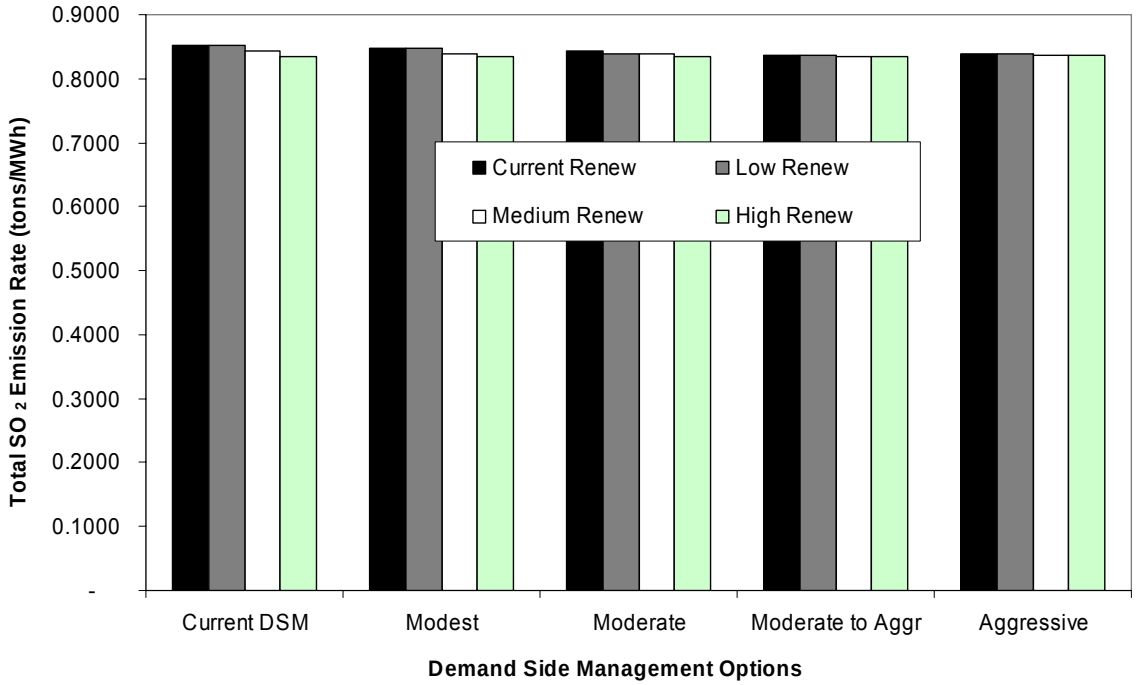


Figure 9: Comparison of NOX Emission Rates

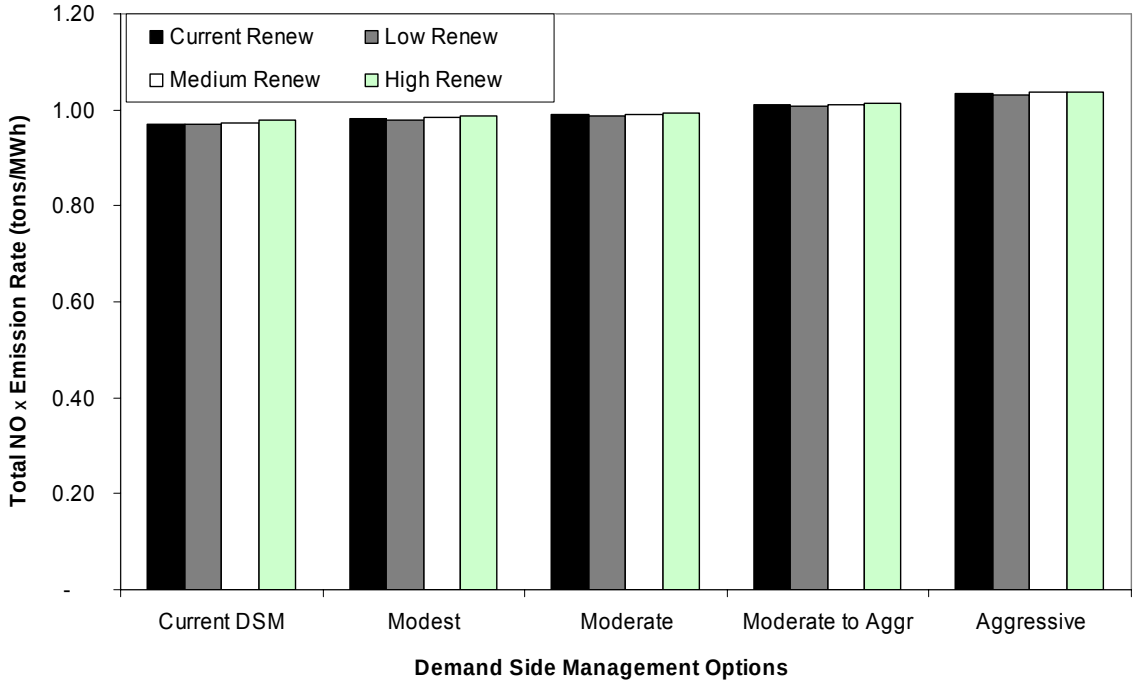


Figure 10: Comparison of Mercury Emission Rates

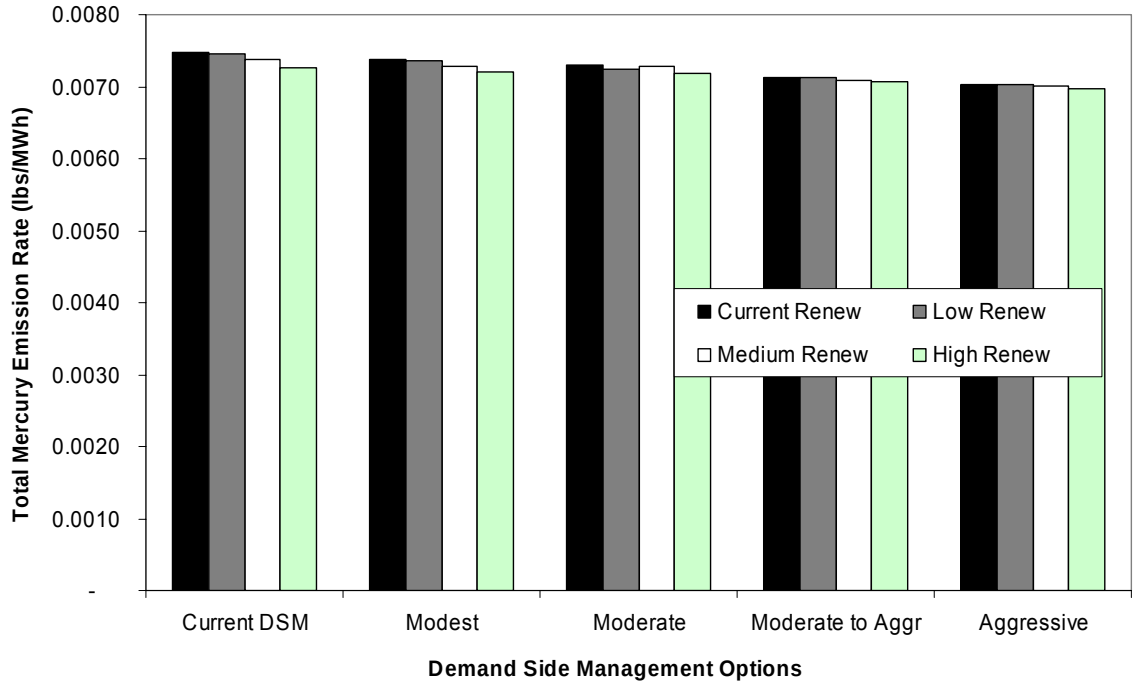
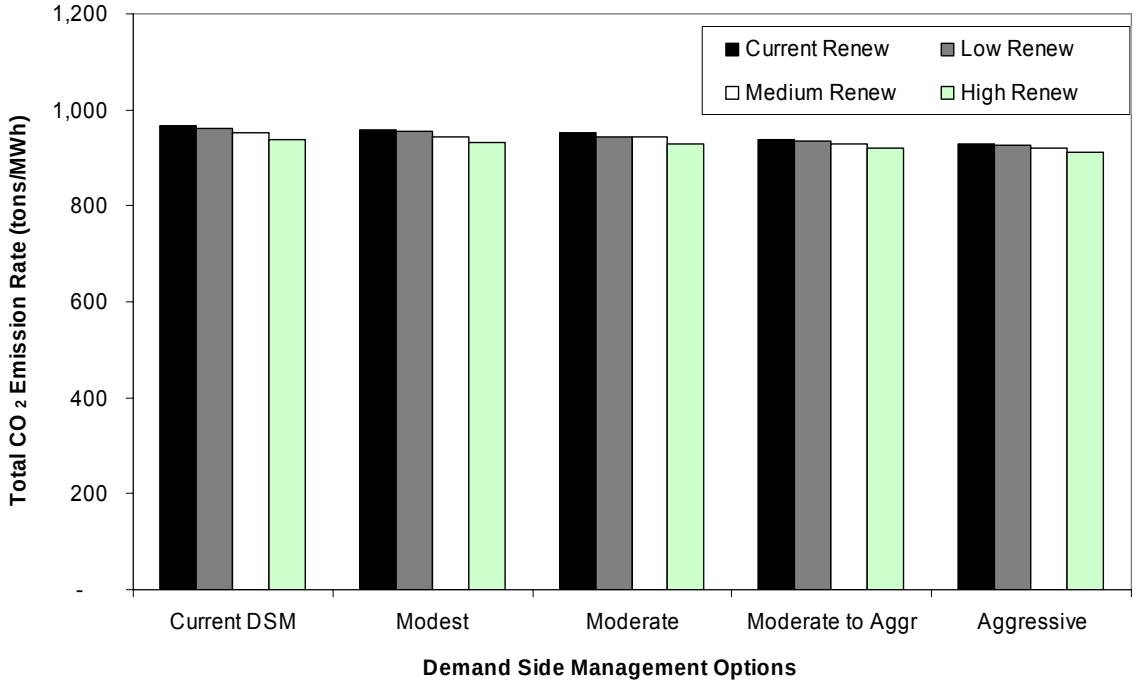


Figure 11: Comparison of CO2 Emission Rates



Overall Evaluation

The difficulty in having multiple metrics is deciding how to weight the results. To evaluate the differences between the total supply costs and the per unit supply costs, both costs were combined graphically to identify trends and clusters of the most attractive scenarios. Figure 7 presents the total supply costs graphed against the per unit supply costs for each scenario over 20 years. This figure shows both the lowest total supply cost value and the lowest per unit supply cost value. It also identifies a cluster of results that are not significantly different. Knowing that the customers prefer low cost, greater DSM and renewable efforts, this cluster helps identify the desired plan. Within this cluster, the scenario that represents both Moderate DSM targets and Medium Renewables levels is the best option.

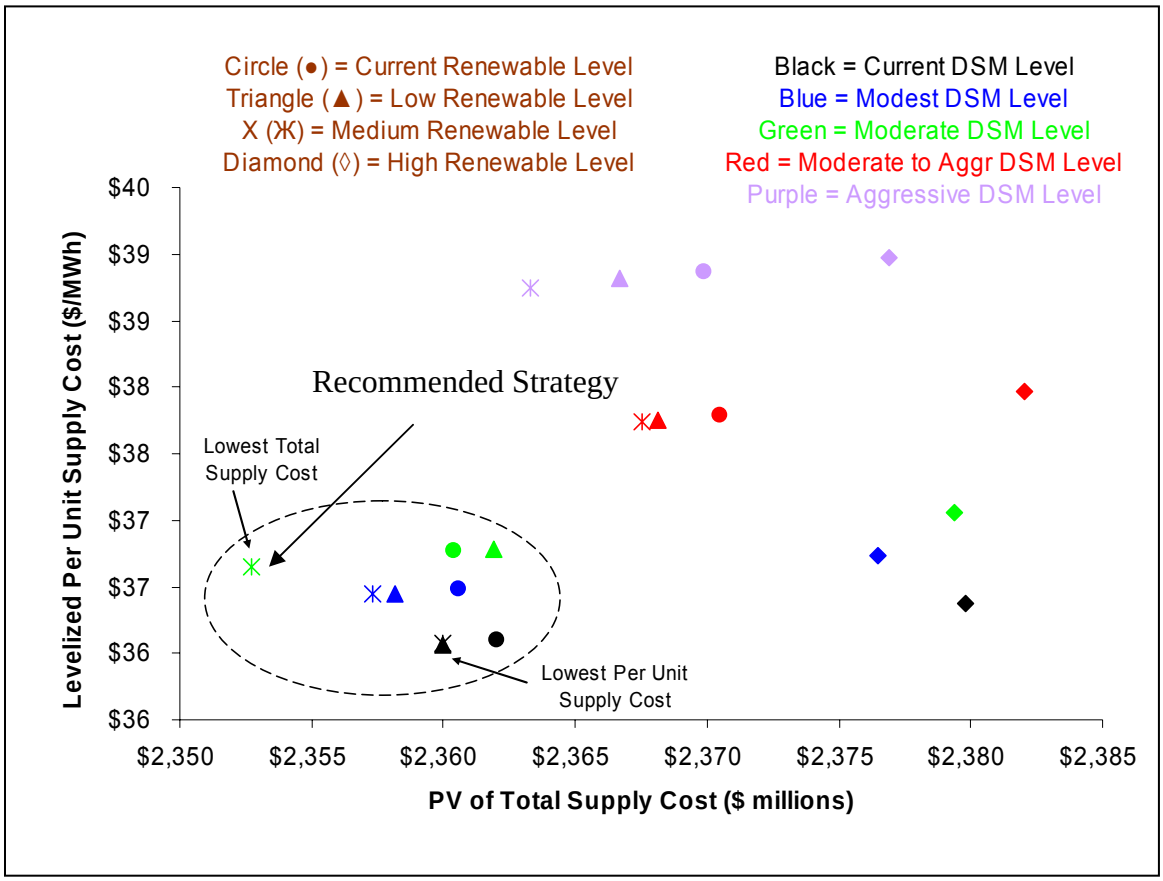


Figure 12: Comparison of Total Supply and Per Unit Supply Cost Differences

Action Plan

This Action Plan covers the period February 26, 2005, through February 25, 2010.

The model results identified the following action items:

1. Renewable Resource Options

   Pursue small hydro power, 2005

   Pursue hydro power, 2011

   Initiate wind power resource, 2006

   Conduct additional analysis of biomass options, 2005-6

2. Demand-Side Options

   Initiate and pursue the Moderate DSM Scenario levels, 2005

   Conduct the customer load study, 2005

3. Conventional Technology Options

   Conduct Coal Plants' Master Plan and Longevity Assessment, 2005

   Manage coal supply-side technologies

   - Continue participation in the Colorado Generation Project
   - Monitor clean coal technologies and coal opportunities

4. Renewable Portfolio Standard

   Continue to evaluate options for compliance

   Monitor the Public Utility Commission's or legislative interpretation of the RPS.

5. Transmission interconnection opportunities

   Continue to investigate additional transmission opportunities, as needed to support supply options

6. Photovoltaic Service Pilot Program

   Gain experience with PV Pilot Program in 2005-2007

   Evaluate benefits, costs and safety related issues

7. Net metering and interconnection of small distributed generation

   Implement net metering tariff in 2005

   Gain experience with net metering in 2005-2007

   Evaluate benefits, costs and safety related issues

8. Load and resources annual review

9. EIRP update by 2010 or as needed

Appendix

Appendix A: **Condensed EIRP Presentation**