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The CLEAN ENERGY Solution

To Xcel Energy's Plan

An Analysis of the Risks and Costs of Constructing a New Coal Plant Versus the Benefits of a Clean Energy Alternative

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EXECUTIVE SUMMARY

Colorado is at an energy crossroads- a choice between continued reliance on fossil fuels and pursuing a clean energy path. Our state's largest electric utility, Xcel Energy (the Company), is in the process of forming their energy resource plan for the next decade. The Colorado Public Utilities Commission (PUC) must first approve the Company's proposal. As a central feature, Xcel Energy proposes to self-build a new $1.3 billion, 750 megawatt (MW) pulverized coal-fired power plant. The 'Comanche 3' plant would be the largest coal-fired power plant built in Colorado in more than twenty-five years.

Xcel Energy's plan to continue relying on fossil fuel development is the wrong proposal for Colorado. Building a large coal plant would harm Colorado's consumers as well as its public health and environment. This paper illustrates the opportunities that could be pursued instead of a coal plant- a clean energy solution investing in energy efficiency and renewable energy. In contrast to the drawbacks of a new coal-fired power plant, pursuing energy efficiency and renewable energy would provide broad energy, economic, and environmental benefits for Colorado.

PROBLEMS WITH XCEL ENERGY'S COAL PLANT PROPOSAL

- **Xcel customers will pay the high costs of the new plant.** Xcel Energy proposes to raise its customers' rates in 2005, increasing each month of each year thereafter until the coal plant is built. The Company testified that "[Xcel] customers will pay the actual costs incurred by the Company to build the plant …Of course, if capital and lead-time risk is higher than expected, the customer will pay more than PSCo estimates today because…the customer bears these risks."
- **Xcel has not shown that the coal plant is the least cost option for Colorado consumers.** Colorado has adopted regulations that require investor-owned utilities to engage in competitive bidding in order to construct or acquire new large-scale sources of electricity. This policy is designed to select new sources of electricity with the least cost and risk to Colorado. However, Xcel Energy has requested a waiver from the PUC's bidding requirements as part of its application to self-build the 750 MW coal plant. If the proposed plant cannot survive the competitive bid process, then it is not the least cost option for Colorado ratepayers. The Company states that it's shareholders are "not willing to take on" the risks that a coal plant involves as a fixed price bid.[1] By skipping the bidding requirement and obtaining PUC approval, Xcel Energy will have permission to pass the risks of the coal plant it is not willing to take onto its customers instead.
- **Coal-fired power plants, the largest source of air pollution in Colorado, threaten Colorado's public health and our environment.** Coal-fired power plants produce the largest amount of carbon dioxide, the leading greenhouse gas, and mercury, a neurotoxin that does not leave the ecosystem once emitted. Coal-fired power plants also emit smog and haze-forming nitrogen and sulfur compounds, as well as particulate matter that contribute heavily to heart and lung diseases.

- **Xcel Energy's existing Comanche coal-fired plants are under notice of violation of EPA pollution standards and adding another coal plant will likely become an increasing liability for the Company.** The EPA lists Xcel's two existing coal plants in Pueblo as high priority violators of the Clean Air Act since 2002 and stated that the federal government may sue the Company. In July, six state attorneys general filed suit against Xcel to make the Company limit the greenhouse gas emissions from its existing coal plants. Global warming may present many expensive problems for both Colorado and Xcel Energy's proposed coal-fired power plant.
- **Pueblo may experience adverse public health and economic impacts from being saddled with another polluting power plant.** The community of Pueblo will be subject to increased pollution; approximately 7500 tons of particulate forming pollutants and 0.22 tons of mercury emissions per year in addition to the current coal pant emissions. The large plant could create a boom-bust economic cycle that does not take into account the future and present costs to the community. The Comanche 3 plant would take an additional 5,500 AF of water from Pueblo's allocation, escalating the valley's water burden.

THE CLEAN ENERGY ALTERNATIVE

This dire picture of Colorado's energy future does not have to come to pass. Colorado can meet its future energy needs through a combination of renewable energy and energy efficiency that will save consumers money and protect our public health and the environment.

By spending the same amount on energy efficiency programs in Colorado as Xcel Energy currently spends in its home state of Minnesota, and by constructing an additional 940 MW of renewable wind energy capacity, Xcel Energy could eliminate the need for a new pulverized coal plant.

An alternative solution:

- Xcel has successfully implemented energy efficiency programs in Minnesota and saved 232 MW of power within 2 years, the equivalent to 31% of the Comanche 3 coal plant proposal. In Colorado, the same energy efficiency investments could save half of the estimated electricity supply from Xcel Energy's portion of the proposed coal-fired power plant by the middle of 2011.
- By developing the total amount of wind energy resources Xcel Energy's own estimates describe as cost-effective without a coal plant- 1440 MW, instead of 500 MW, the limit the Company has self-imposed, Xcel Energy could provide the remainder of the energy the coal plant would supply.

Advantages of the Clean Energy Alternative

Clean energy will save consumers money. Clean energy is a "better buy"—it will save consumers and businesses nearly $2 billion over a 20-year period. Second, the clean energy alternative would provide system reliability by significantly reducing peak electric demand. Third, the alternative would diversify Colorado's energy resource portfolio, thereby reducing exposure to potential fuel price hikes and future regulation of carbon dioxide and mercury emissions.

Renewable energy and energy efficiency offer a variety of economic and environmental benefits. Compared to the proposed coal-fired power plant, there would be no fuel costs and no pollutant emissions from wind energy and energy efficiency. This would greatly benefit public health, especially in the Pueblo area. The clean energy alternative would save billions of gallons of water a new coal-fired power would consume. There would be more jobs supported throughout the Colorado economy and there would be increased economic activity in rural areas of the state.

If the coal plant achieves an expected 85% capacity value, it may be valued as a 638 MW resource, with continuous emissions, water consumption, and fuel cost issues. The cost for the coal over its lifetime could exceed its initial capital cost. In contrast, if the 940 MW wind resource achieves an expected 30% capacity value, it will be valued as a 300 MW resource, with no emissions, no water consumption, and no fuel prices over the life of the turbines. Energy efficiency investments similar to what the Company has already accomplished in Minnesota would save more than half of the proposed energy supply the coal plant would generate for Xcel Energy's system.

By upholding consumer protections found in the LCP rules and rejecting the current Comanche 3 proposal, the Colorado PUC can help set the course for a cheaper, safer energy future— to the benefit of all who live, work, and breathe in the state of Colorado, as well as to the benefit of Xcel Energy.

INTRODUCTION

Xcel Energy Corporation, the sixth largest electric utility in the United States (the Company, Public Service Company of Colorado), provides electricity for 75 percent of Colorado's population.[2] In exchange for this monopoly over Colorado electric customers in their exclusive service area, Xcel Energy is subject to the jurisdiction of the Colorado Public Utilities Commission (PUC or the Commission), a state regulatory agency whose Commissioners are appointed by the Governor. The mission of the PUC is to "achieve a flexible regulatory environment that provides safe, reliable and quality services to utility customers on just and reasonable terms, while managing the transition to effective competition where appropriate."[3]

Xcel Energy must present to the PUC its projected electric generation needs and its plans for acquisition of resources to meet those needs. The Least Cost Planning Rules (LCP Rules), revised in 2002, purpose is:

> …to determine the need for additional electric resources by Commission jurisdictional electric utilities…[with] the policy that a competitive acquisition process will normally be used to acquire new utility resources. This process is intended to result in least-cost resource portfolios…the rules are intended to be neutral with respect to fuel type or resource technology.[4]

Xcel Energy's first filing under the LCP Rules occurred on April 30, 2004.[5] A centerpiece of Xcel Energy's LCP is to self-build a 750 Megawatt (MW) 'supercritical' pulverized coal-fired electric generating station. Xcel has already chosen the size and prospective location for this plant, the Comanche generating station, where two of its coal plants currently are located on the outskirts of Pueblo. The proposed 750 MW coal-fired power plant would create the largest aggregate coal-fired generation facility in the state.

For this prospective plant, however, Xcel Energy has requested that the PUC ignore its LCP rules. First, Xcel has included a request for certification approval for a specific project as part of its 'neutral' Least Cost Plan. Second, the Company has asked the plant be approved without competitive bidding. Finally, Xcel's proposed regulatory plant passes the risks and costs of the plant onto ratepayers before it is built, sparing Xcel Energy shareholders who will reap the profits from the investment.

The first objective of this White Paper is to elucidate the many risks, costs, and liabilities associated with Xcel Energy's planned Comanche 3 coal-fired power plant. These include risks to Colorado's ratepayers and clean energy future, to the community of Pueblo, their public health and environment, and the risks, costs and liabilities associated with global climate change and future environmental damage and regulation.

The other objective of this paper is to highlight a clean energy alternative based on greater investment in renewable energy sources and energy efficiency measures. The

clean energy alternative would provide greater economic and environmental benefits for Colorado as well as the Company, compared to construction of the proposed coal-fired power plant. Xcel Energy has already learned this. The Company has successfully developed large amounts of energy efficiency and renewable energy in its home state of Minnesota. Xcel should maintain and expand its cost-effective energy efficiency and load management programs in Colorado, replicating the level of program activity and impact it is having in Minnesota.

Comment:

It is also imperative that an open bid process, designed to safeguard ratepayers from project development risks, be undertaken to allow the evaluation of alternative solutions for Colorado's power needs. Xcel Energy should withdraw its planned coal-fired power plant because its needs can be implemented with cheaper, cleaner, and less risky energy technologies. Furthermore, the authors support regulatory changes necessary to make these clean energy technologies a more attractive investment option for Xcel Energy's shareholders.

PART I. THE DRAWBACKS OF XCEL ENERGY'S PROPOSED COAL PLANT

In their Least Cost Plan (LCP application), Xcel Energy forecasted the need for Colorado electric generation to grow by 3600 MW within the next ten years. Of that figure, the Company expects renewed power contracts to account for approximately 1600 MW, leaving new acquisition to fill in the 2000 MW remainder. To meet this need, Xcel Energy proposes a three-pronged strategy: renewable (presumably wind) energy, an all-source solicitation, and self-building a pulverized coal-fired power plant. The first two prongs will be accomplished in accordance with the LCP rules by engaging request for proposals (RFPs) that will be competitively bid to benefit the Company and ratepayers.

Initially, Xcel Energy has been granted permission to acquire a maximum of 500 MW of wind turbine electric generation. The Company has followed the LCP rules, assuring that the least cost bid will be chosen to meet their proposed resource need. Xcel Energy's pending 'All-Source' RFPs will also utilize the competitive process to provide up to 2800 MW of additional power. The All Source RFP could, on its own, meet the Company's projected resource acquisition needs.

For the final piece of their LCP application, however, Xcel Energy has proposed self-building a coal-fired power plant to produce 750 mega watts (MW) of electric generation. Xcel Energy would own 500 MW of this plant as base-load generation, and could sell the remaining 250 MW to rural electric cooperative equity partners.

Xcel Energy has implemented its strategy to fast-track the proposed coal-fired power plant before the PUC in several ways, including:

- Receiving approval from the PUC for specific regulatory and rate treatment for the project even though the LCP rule require that the plan be "neutral to fuel type" or "resource technology" process.

- Arguing that the proposed coal-fired power plant should be exempt from the competitive bidding requirement of the Commission's LCP Rules.
- Submitting a motion requesting that the PUC approve a regulatory plan that calls for increased rates on residential, small business, commercial and industrial customers in 2005 and increasing each year thereafter through 2009 to pay for financing and capital costs of the coal plant before it is completed, contrary to electric rate-setting procedures and law.[6]
- Successfully arguing to consolidate the regulatory rate plan with the approval of the coal plant and the LCP approval proceedings.

If the PUC grants all of Xcel Energy's motions, then all of the risks, costs, and liabilities of the coal plant will be transferred from Xcel Energy's investors to Colorado ratepayers. The Company's shareholders will avoid liability for the risks and costs of constructing a new coal-fired power plant, yet the shareholders will reap the profits.

I. THE PROPOSED COAL PLANT IS A BAD DEAL FOR COLORADO'S CONSUMERS AND BUSINESSES

Historically a foundation of our electrical supply, today coal poses one of the top dilemmas of energy policy. In the U.S., coal is plentiful and relatively inexpensive. However, it is also the most polluting fossil fuel and a major contributor to worldwide global warming. The price of coal-derived electricity quoted by Xcel Energy does not represent its actual costs. Subsidies to coal, which are many times greater than those given to renewable energy and energy efficiency technologies, artificially deflate the price of coal. For example, the price of coal does not account for the risks, costs, and liabilities of coalmine clean up, increases in lung and heart disease, coal transportation by rail (a significant problem in Pueblo), tax credits, and unregulated emissions.

Comment:

Coal prices today continue to rise. In fact, on August 15, Standard & Poor's warned that credit ratings of some U.S. utilities could be jeopardized over the long term if surging coal prices remain near current levels. The rebounding U.S. economy and China, "has caused coal prices to soar -- in some cases nearly doubling...Higher oil and natural gas prices, low inventories at power plants and railroad bottlenecks also have contributed to the run-up in coal prices, as has the lower U.S. dollar, which encourages U.S. coal exports."[7] Xcel Energy stated in their LCP application that a major motivation to build the coal plant is to better the Company's credit rating, when the plant may actually devalue it.[8]

One of Xcel Energy's other chief arguments for proposing a new coal-fired power plant is the need to avoid the rising and variable cost of natural gas.[9] However, that argument fails to recognize the economic connection between fossil fuel prices. During the mid-1970s and early this decade, in the wake of the oil and gas shortage across the country, the price of coal sharply increased. "Among the…upward pressures on the price of coal was the increased price of oil and gas."[10] If Xcel Energy's modeling did not factor in potential increases in the price of coal, their projections could be well shy of the actual

costs to ratepayers.[11] Renewable energy and energy efficiency have no fuel costs, and thus no danger of fluctuating fuel prices.

Comment:

Xcel Energy justifies constructing a self-build supercritical pulverized coal-fired power plant by citing several factors:[12]

- Increasing customer demand for base-load energy,
- A reduction in the amount of Company owned coal-fired generation capacity from retiring plants at the Arapahoe station,
- A reduction in the amount of coal-based purchases from other utilities,
- The addition of 3,000 MW of gas-fired capacity since 1996, and
- Increased price and volatility of natural gas.

However, none of the above factors support the construction of a new coal-fired power plant. Demand for energy services can be met with far less capital investment than fossil-fueled power plants. Instead, there are several financial and profit-oriented motives directly influencing Xcel Energy's proposal to build Comanche 3.

- Xcel Energy will increase its profit (return on investment) by building and owning most of a large and capital-intensive power plant.[13]
- The favorable outcome that owning a new plant may have on the Company's equity-to-debt ratios.
- The Company's indirect investments in natural gas purchase agreements has led to problems with the Company's stock value and bond rating, as well as systemic over-dependence on an increasingly expensive fossil fuel.

Comment:

The proposed coal plant is, in large measure, intended to bolster the Company's financial position. Building the coal plant would serve Xcel's financial interest, but it does not mean that the new coal-fired power plant is in the public interest. Nor does it mean that the plant should be approved without an open bidding process among resource options or that ratepayers should be required to shoulder project development risks over which they have no control. Nor does it mean that Xcel Energy cannot recover financially with investments in the clean energy alternative.

Comment:

A. Colorado's Businesses and Consumers Will Pay Up Front for the Construction Risks, Costs, and Liabilities of the Coal Plant and Then Pay for the Power

Electric rate regulation predominantly has refused to allow a utility to pass costs of constructing a power plant onto its customers until such plant has become 'used and useful'- in other words, until customers benefit from the product.[14] However, Xcel Energy proposes to pass the costs of the Comanche 3 plant onto Coloradoans before breaking ground.

In other words, the Company proposes that ratepayers pay for the up-front, capital investment costs of constructing the plant, starting in 2005. However, ratepayers will still be charged for the power and energy the plant produces once operational, after having borne all the investment risks usually borne by shareholders. Xcel Energy's shareholders

would still collect the profits, however, when the plant is added to "rate base" and Xcel is allowed to earn a return on this investment.

There are "well recognized risks" associated with construction and operation of a coal-fired power plant. By investing in a self-build power plant, "shareholders are compensated for those risk[s] by being allowed to earn a return on the monies invested to build the plant."[15] Shareholders thus prefer construction over outside contracts because they can make a return on the investment.

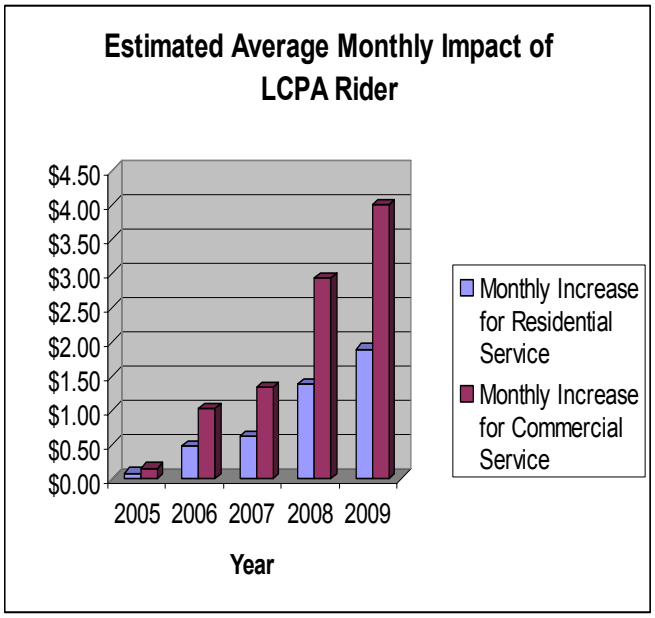
Xcel Energy has chosen the most expensive form of capital to utilize in building this power plant (two to three times more than debt financing). This action will serve to increase the amount of the proposed rate hike on consumer's bills, while decreasing the risks to the Company's shareholders. Once the electric rate rider for the proposed coal plant is approved and put into effect, the ratepayers will be 'on the hook' for all of the problems that may arise- economic, environmental, and otherwise. The Company will have less incentive to manage costs and the PUC will have increased difficulty conducting prudence reviews after the fact.

In their LCP application, the Company stated that the costs to develop a bid for a coal plant are too high for non-utility developers. Further, the Company stated they were not willing to bear the business and financial risks of building the coal plant because conventional financing was "not practical" in light of the risks to cash flow impacts, the risks of inflation over the construction period, the risks to "investors" from "credit rating agencies" and the Company's "stock price." But, the Company noted, they are in the best position to assure that a coal plant gets built because:

> [Xcel] customers will pay the actual costs incurred by the Company to build the plant including actual financing cost…Of course, if capital and lead-time risk is higher than expected, the customer will pay more than PSCo estimates today because…the customer bears these risks.[16]

Thus, to avoid problems with constructing a coal plant and its risks and costs that no other developer is expected to bear, the Company seeks to have consumers shoulder risks even beyond the financing measures markets normally afford utilities.[17] Xcel Energy has filed for a "Least Cost Plan Adjustment Rider" (LCPA) that would raise electric rates each year from 2005 until 2009.

Figure 1 Monthly rate increases for commercial and residential service under the LCPA coal plant rider.[18]



In exchange for their high electric bills and investment, consumers will only be rewarded with a series of economic, health, and environmental risks of adding an additional coal plant to our system, while paying heavily for it. Rates will not go down once the plant is built. If anything, they will continue to rise.

B. Constructing A New Coal-Fired Power Plant Would Decrease Fuel Diversity and Energy Independence in Colorado

Constructing the Comanche 3 power plant would not help Colorado diversify its energy base. It would leave Xcel's captive Colorado customers vulnerable to price increases or shocks due to swings in coal price, CO_2 emissions costs, or new environmental regulations on power plants.

Colorado is already heavily dependent on coal for electricity production. This fuel was responsible for over 88% of the energy input for electricity production in the state in 2000, the most recent year for which data are available (see Table below). Coal dependence has declined somewhat since 2000 with the addition of new gas-fired power plants and two wind power farms, but over 70% of Colorado's energy still comes from coal-fired power plants. As the table below shows, our dependence on coal-based power increased substantially during the 1970s and 1980s.

Table 1: Fuel Consumption for Electricity Generation at Electric Utilities in Colorado (% of total energy input)

	Coal	Natural Gas	Petroleum	Hydroelectric Power	Other
1975	59.3	27.7	4.8	8.2	0.0
1980	79.6	12.3	1.1	7.0	0.0
1985	90.8	1.60	0.2	8.0	0.0
1990	94.3	1.6	0.1	4.0	0.0
1995	92.6	1.1	0.1	6.2	0.0
2000	88.5	7.9	0.3	3.3	0.0

Source: U.S. Energy Information Administration State Energy Data 2000

C. Xcel Energy's Requested Bid Waiver Rejects the Least Cost Solution

The LCP Rules were designed by this PUC to foster market-based competition in the acquisition of electric generation and to benefit Colorado ratepayers and safeguard them from the risks and uncertainties of the electricity supply business over which they have no control.[19] The centerpiece of the market strategy was to create a mandatory competitive bid system for specific projects once the PUC approved the resource need. Although competitive bidding was required, the PUC created an exemption, up to 250 MW during each planning cycle, for niche market opportunities, such as the re-powering of existing facilities or contract renewals, whose circumstances could be shown through rigorous cost-benefit analysis to justify acquisition outside of competitive bidding.

In the first major filing since the Commission adopted the LCP Rules, Xcel Energy requested a waiver of the competitive bidding process for their entire proposed coal-fired power plant. The waiver request is not simply an extension of the exemption limit to cover a 750 MW coal-fired power plant.[20] Rather, the waiver would operate to eliminate the competitive bid process for the largest power plant built in Colorado in the last three decades.

Xcel Energy offered several reasons for requesting a waiver of the competitive bidding process:

- Capital Risk and Construction Lead Time- Coal plant development costs twice as much and takes twice as long as non-coal technologies.[21]
- Complex Design and Permitting Issues- Developing a "bid quality" estimate for a coal plant costs between $10-20 million. Xcel claims to have mitigated these costs by having sited and researched the feasibility of Comanche 3.[22]
- Need for Joint Development- Joint development and ownership in coal plants serves to distribute the high costs and risks of a coal plant between utilities. Negotiating competitive bids between various utilities is time consuming, and hence, expensive.

Exemption from the competitive bid process would result in a windfall for Xcel Energy. Xcel would be able to construct their proposed coal-fired power plant without any market-based investigation of whether or not the proposed coal-fired power plant is truly the least-cost, lowest risk resource for its customers.
The Company claims that this is needed to make a self-build coal-fired power plant feasible. In its rationale for requesting exemption from competitive bidding for the proposed coal plant, the Company made the following conclusion regarding self-building:

> Coal plant development exposes developers to considerably more financial risk than developers of other currently available technologies. Because developers typically offset financial risk by increasing their prices, coal developers must increase their prices relatively more than with less capital intensive projects.[23]

Instead of burdening the developer with financial risks that a prudent company must internalize, but that makes competitive bidding unattractive and causes increased prices, Xcel Energy claims that it can self-build because it can legally pass those increased risks, costs, and liabilities onto Colorado ratepayers once the PUC approves its regulatory plan and coal plant.

Xcel Energy uses the risks and complexity of coal plant development as reasons to avoid competitive bidding, when in fact it is the competitive bidding process that evaluates the costs and benefits of such risks and complexities. **The rationale that a coal project will not win a competitive acquisition bid and therefore should not have to go through the bid process because the Company can pass costs to the consumer to possibly save consumers money is circular. If the plant cannot survive the competitive bid process, then it necessarily is not the least cost plan for Colorado ratepayers.**

Most disturbing in Xcel Energy's request for waiver is the effect it will have on the PUC and the LCP Rules. Granting a waiver for the largest single energy generating resource in 25 years in Colorado, without proving it is the least cost, lowest risk option, turns the very essence of the LCP Rules on their head and is thus not in the public interest.

II. THE PROPOSED COAL-FIRED POWER PLANT WOULD HARM COLORADO'S PUBLIC HEALTH AND ENVIRONMENT

D. Coal-fired power plants are the largest single source of dangerous pollutant emissions in the country

Nationally, coal-fired power plants are the largest single source of carbon dioxide and mercury emissions. Plus, coal-fired power plants produce significant amounts of sulfur dioxide, nitrogen oxide, and heavy and fine particulate matter.[24]

Emissions of each of these pollutants carries serious consequences[25]:

- *Sulfur-dioxide*: SO2 is a major ingredient of smog and haze. It also contributes to the acidification of waterways, falling as "acid rain."
- *Oxides of nitrogen*: These are major contributors to ground-level ozone, which impairs respiratory function and has particularly severe effects on asthma sufferers. Over 2500 children in Pueblo suffer from pediatric asthma.[26] In addition, nitrogen 'loading' severely hampers agricultural productivity, and contributes to regional haze in national parks such as the Great Sand Dunes near Pueblo.
- *Particulates*: Particulate matter in the air impairs respiratory function and contributes to heart disease. According to the American Lung Association, over 42,000 children under 18 are exposed to Comanche's current emissions, including 11,448 who already live in poverty.[27] According to the American Heart Association, particulate emission is responsible for 24,000 deaths each year.[28]
- *Mercury*: Mercury is the perhaps the most dangerous of all coal plant pollutants. It is a potent neurotoxin, causing significant developmental disabilities and neurological disorders. The United States Environmental Protection Agency (EPA) recently more than doubled, to 630,000, its estimates of the number of infants born with elevated mercury levels.[29] Coal plant mercury emissions are deposited in Colorado's rivers, lakes, and streams, threatening aquatic wildlife and recreational fishing. The fish in the waters around Pueblo have not been tested for mercury levels in over 20 years.
- *Carbon Dioxide:* Carbon dioxide is the primary 'greenhouse gas' responsible for increased global temperatures and the significant and mounting problems caused by rapid global warming. A recent report by the World Health Organization (WHO) estimates that global warming is already responsible for 150,000 deaths annually and that this number may rise to 300,000 deaths per year by 2030 unless further action is taken worldwide to reduce emissions of carbon dioxide and other greenhouse gases.[30]

Comment:

- *Xcel Energy's Existing Pueblo Coal Power Plants Are Under Federal Pollution Violation Notice*

Xcel Energy, through PSCo, has not proven its ability to successfully manage pollution costs, or lower consumer rates, at its existing coal plants in Colorado. The EPA indicates that the Comanche 1 and 2 facilities are currently designated as a High Priority Violator under the Clean Air Act.[31] Even while under violation, Xcel has not retrofitted Comanche plants 1 and 2 units with "scrubbing" technology necessary to remove sulfur dioxide.

Comment:

The EPA issued Notice of Violation to Xcel Energy on June 27, 2002 for exceeding air pollution allowances at the Comanche facility. To date, Xcel has not complied with the Notice of Violation.

Comment: .

E. The Community of Pueblo's Health has not been adequately addressed

Whether or not Xcel Energy's proposed coal-fired power plant provides the short and long-term benefits Xcel claims, it would harm the Pueblo community in a number of

ways. Pueblo is a community that is already experiencing adverse public health impacts from air pollution. Air quality in Pueblo's will further deteriorate if the new coal-fired power plant is built.

Environmental justice combines the issues of environmental health with social justice.[32] Local activists from Pueblo petitioned the EPA to have their community considered for environmental justice community status. The EPA determined that Pueblo "meets all of the classic criteria for an environmental justice community."[33]

> [Pueblo] is disproportionately impacted by major polluting facilities, none of which are locally owned... Only a tiny fraction of the money generated by the production and sale of those products [manufactured] stays here in Pueblo. More than 40% of Pueblo's population is Hispanic, African-American, or of other non-Caucasian heritage. Pueblo's median family income is less than two-thirds of the national average. Pueblo's unemployment rate is about 7%, versus 5.6% nationally and 5.9% statewide. Pueblo's asthma rates are among the highest in Colorado and Colorado's are among the highest in the nation. Health insurance rates are much higher here than in any other part of Colorado. The Arkansas River through and below Pueblo already has been classified by the State of Colorado as "impaired" because of poor water quality.[34]

According to Xcel Energy's estimates, the proposed 750 MW pulverized coal plant will involve expenditures of approximately $1.3 billion, and generate approximately 1,000 temporary construction jobs and 40 permanent operations and maintenance jobs. This scenario represents a dramatic boom-bust cycle for the Pueblo economy. To build the large power plant, Xcel would need to bring in skilled construction workers from outside Pueblo, or even outside Colorado. Substantial portions of the wages paid to non-Pueblo-based workers would not be spent or reinvested into the Pueblo economy, but would be sent back home. Once the construction of the plant was complete, these jobs would disappear but the workers might not, forcing Pueblo to bare the burden of the bust cycle. Yet the economic activity from the construction phase would disappear entirely from the Pueblo economy.

Typically, only approximately 20% of construction labor for in-state power plants comes from Colorado. Xcel claims it will "bring" up to 1,000 construction jobs to Pueblo. However, it is likely that only 200 of these jobs will be for in-state workers, spread out over the entire construction period of the project. In addition, Xcel touts 40 permanent jobs for Pueblo. Up to 60% of operational labor is usually from within the state, so this means about 23 permanent jobs.[35]

In addition, Pueblo's city council has promised significant tax breaks to the new generating facility, such that Pueblo might actually lose money, considering the additional costs it would bear to support the boom/bust cycle, the decreased availability of water, and the effects of increased exposure to pollution. The City of Pueblo is

proposing a 50% tax break for Xcel (on real and personal property taxes) with a value of at least $24 million over ten years. Both the tax revenue and the job creation will likely be much less significant for the Pueblo community than Xcel makes them appear.

F. Constructing a Large Coal-fired Power Plant Would Put Pressure on Pueblo's Water Supply

The proposed coal-fired power plant would consume a large amount of water—a very precious resource in Colorado. Xcel Energy estimates that with a hybrid wet-dry cooling system, the Comanche Unit 3 plant would consume approximately 5,500 acre-feet (AF) of water every year.[36] Xcel Energy's Comanche 1 and 2 plants currently use approximately 9,500 AF of water every year. The projected water consumption of Unit 3 alone is equivalent to the water use of about 10,000 typical households in the region.

During the 2002 drought, Pueblo experienced low water supplies and was forced to enact watering restrictions. As Pueblo approaches the limit of its existing water resources especially in periodic low-water years, the 15,000 AF of water to be committed to power generation is water that cannot be used to support new business development, residential expansion, or nearby farms and rural communities.

The Pueblo Board of Water Works anticipates "build-out" – the point at which water demand meets Pueblo's currently available supply – in roughly 2060. Current projections are that Pueblo's population will grow at a much faster annual rate – 1.6% – over the next 25 years.[37] It is likely that Pueblo's water supply build-out will be reached well within the life of the proposed new plant. In order to support additional growth, Pueblo may be forced to purchase new water rights – at current prices, roughly $5,000 per acre-foot – or attempt to build expensive and uncertain water storage facilities. This would increase the cost of water to all households and businesses in Pueblo.

In addition to a coal plant's direct water consumption, according to recent research, air pollution from the proposed coal-fired power plant may decrease precipitation and worsen drought conditions in the West. Research based at the Storm Peak Laboratory in Steamboat Springs, CO, confirmed that particulate pollution from sources including coal-fired power plants reduced the amount of precipitation and snowfall from mountain clouds and prevented the formation of rain droplets that would otherwise have fallen to the surface. *See* Borys, R.D., D.H. Lowenthal, S.A. Cohn, and W.O.J. Brown, "Mountaintop and radar measurements of anthropogenic aerosol effects on snow growth and snowfall rate." *Geophysical Research Letters 30*, No. 10, 1538. 2003.

G. Constructing a Large New Coal-Fired Power Plant will Contribute to Global Warming and Cause Higher Costs If Carbon Dioxide Emissions are Taxed or Regulated

Comment:

The phenomenon of climate change is now very well established and is best summarized in the documents of the Intergovernmental Panel on Climate Change (IPCC).[38] Fossil fuel

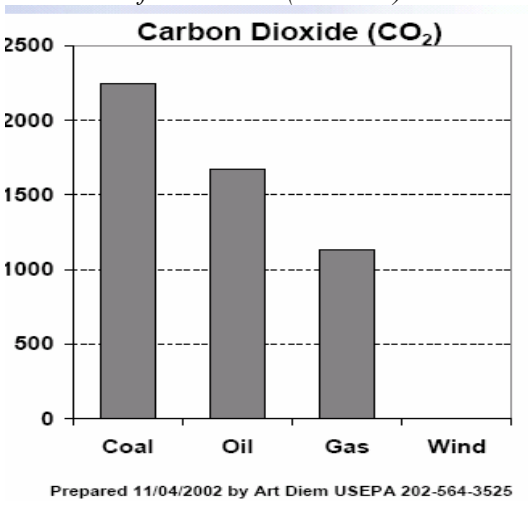
combustion accounts for over three-quarters of human-caused emissions of carbon dioxide (CO_2), the main greenhouse gas linked to climate change.[39] With the buildup of carbon dioxide and other greenhouse gases in the atmosphere, the average temperature of the earth's surface increased 1.1°F over the past century. The 1990s were the warmest decade on record, 1998 was the single warmest year in the past 1,000 years, and 2002 and 2003 tied for the second warmest year.[40] As of Xcel Energy's LCP application, the U.S. government has not regulated carbon dioxide or mercury emissions from power plants. This means that emission levels can be determined by the utility without recourse, and that future and pending regulation affecting those pollutants presents unknown costs to a new coal plant.

The EPA, in its U.S. Climate Action Report 2002, evaluated potential costly and disruptive impacts from global warming.[41] The predicted impacts in the Interior West include:

Comment:

- Less snow during the winter, leading to reduced snowpack. Reduced snowpack affects water supply, agriculture, and the billion-dollar winter sports industry.
- Disappearance of alpine meadows and the ecosystems they support.
- More frequent and severe wildfires.
- More rain in the summer leading to flooding due to extended rainy seasons.
- Loss of cold-water fish, such as trout, from Rocky Mountain fisheries.

Figure 2: Emission Rates: Fossil fuels v. wind (lbs/MWh) 1998



Colorado is feeling the effects of global warming. Our state has hit record summer temperatures over the last four years, and has experienced prolonged drought whose equal has not been found in the historical record. Severe wildfires have accompanied the drought. At the same time, there has been flooding and habitat loss in rivers and alpine areas.

The PUC has stated that they do not consider climate change to be a factor in determining the least cost resource plan and the risks and costs of a coal-fired power plant. But at the PUC pre-hearing conference on July 8, 2004, Xcel Energy testified that they were forced to recalculate their electric load projections due to enhanced "weather related variability." More frequent and extreme weather events including droughts, floods, and heat waves, the Company said, affect electricity load increases, and thus rate increases. There appears to be an important, but unacknowledged, link between "enhanced weather related variability" and global climate change. Increasing greenhouse gas emissions through additional coal-fired generation would likely only exacerbate the weather related variability problems identified by Xcel Energy.

In July of 2004, six state attorneys general filed suit against several electric utilities, including Xcel Energy, for their failure to address climate change and greenhouse gas emissions.[42] Lawsuits such as these pose a specter of massive financial uncertainty for the Company and its ability to quantify the risks, costs, and liabilities of adding to their greenhouse gas emissions by constructing a new coal plant. Of course, those risks and costs would be borne by the consumer if Xcel wins PUC approval of its plans. Contrary to the PUC's position, climate change poses a serious threat to increase consumer rates.

Not all governments and utilities are ignoring the scientific and economic evidence that human activity is contributing to climate change and that this warming is producing adverse impacts. Many industrialized countries have enacted greenhouse gas emissions caps pursuant to the Kyoto Protocol. There is growing support for action on global climate change in the U.S. Congress- 43 Senators recently voted for caps on CO2 emissions from power plants and industrial sources.[43] In the Interior West, several communities, including Albuquerque, Salt Lake City, Aspen, Boulder, Denver, Fort Collins, Mesa, AZ, and Tucson have adopted goals for greenhouse gas emission reductions through the Cities for Climate Protection program of the International Council for Local Environmental Initiatives.

Several investor-owned utilities have recognized the importance of cutting (not increasing) their level of carbon dioxide and greenhouse gas emissions. The box below highlights utilities that have committed to reducing their absolute level of emissions, unlike Xcel Energy which has pledged to reduce CO2 emissions per unit of electric energy production, which means that Xcel's absolute emissions could still rise.

Action on CO_2 Emissions by U.S. Power Companies

American Electric Power will cap CO_2 emissions at the average of 1998-2001 levels and reduce or offset them by a cumulative 10 percent over the period 2003-2006.
Cinergy Corp. pledged to reduce greenhouse gas emissions to an average of 5 percent below 2000 levels during the period 2010-2012.
DTE Energy committed to reducing greenhouse gas emissions by 5 percent from 1999 levels by 2005.
Entergy will stabilize CO_2 emissions at 2000 levels through 2005.
PSEG committed in 1993 to stabilize CO_2 emissions from power plants in New Jersey at 1990 levels by 2000. They have achieved this goal while generating 2 million more megawatt-hours in 2000 than in 1990.

Figure 3: U.S. power companies with carbon dioxide emissions programs- from the WRA Balanced Energy Plan

PART II. THE CLEAN ENERGY ALTERNATIVE

A new coal-fired power plant is not the only option for serving Colorado's growing population and economy. Consumers, businesses, and environment would be better served by a more cost-effective approach to meet our growing demand for energy services- a clean energy solution that combines increased investment in energy efficiency and renewable energy sources.

In the past, heavy dependence on fossil fuel-based central power plants has delivered fairly reliable electricity at relatively low rates in Colorado. However, this situation has changed. The cost of power is rising due to higher natural gas prices, drought-reduced hydroelectric generation, and compliance with tightening environmental regulations. The power grid is becoming increasingly vulnerable to disruption due to natural or man-made causes.[44] By pursuing an alternative approach– one based on additional investment in distributed renewable energy and energy efficiency resources – Xcel Energy can diversify its resource mix, save its customers money, and better protect the environment.[45]

Colorado has about 15 times more renewable energy potential than the entire state currently consumes in electricity each year. Colorado's potential electricity production from renewable energy resources (wind, solar, geothermal, and biomass) is estimated to be around 689,000 GWh/yr. In 2002, total electricity consumption in Colorado was approximately 46,000 GWh/yr.[46] Xcel Energy is proposing to purchase an additional 500 MW of wind power capacity by the end of 2006. This capacity, if built, would generate about 1,270 GWh/yr of electricity annually according to the Company. This is a good start towards diversifying and adding more clean resources to Xcel Energy's overall power mix. But much more can and should be done to develop renewable energy resources in Colorado.

Colorado's energy efficiency resource is also very large and relatively untapped. One in-depth study estimated that adoption of cost-effective energy efficiency measures in homes and businesses could reduce electricity load growth during 2003-2020-- dropping from 2.8% per year (base scenario) to 0.7% per year (high efficiency scenario). This would translate into 31% less electricity use by 2020 in the 'high' efficiency scenario, or eliminating the need to construct seven 500 MW power plants or their equivalent. The study also found that realizing this level of energy savings over an 18-year period could produce net customer savings of $6.4 billion (i.e., value of the energy savings minus the cost of the efficiency measures).[47]

In considering alternatives to Xcel's 500 MW base-load share of the proposed 750 MW coal-fired power plant, we assume the plant operates at 85% capacity factor when it is fully operational. This means the Xcel portion would generate 3,723 GWh/yr of electricity. Assuming 7% transmission and distribution losses on average, the Xcel portion would supply 3,462 GWh/yr of electricity to consumers and the plant would provide a net output of 638 MW.

Comment:

By combining a strong energy efficiency effort with additional renewable energy development, Xcel Energy could replace its share of the proposed Comanche 3 coal-fired power plant with resources that are smaller scale, more diverse, more cost-effective for consumers and businesses, more labor intensive, less water consuming, and less pollutant producing.

Figure 4: A Balanced Energy Plan for the Interior West: Summary

A Balanced Energy Plan for the Interior West
(available at www.westernresourceadvocates.org)
A report issued by Western Resource Advocates which used the utility industry's modeling software demonstrated that it is possible to reliably serve the future demand for electric energy services from a resource mix that does not include new large coal-fired plants. The Balanced Energy Plan examined the economic, environmental, and other effects of pursuing a portfolio that includes substantial amounts of renewable energy and energy efficiency in contrast to a "Business as Usual" scenario which would continue deployment of conventional resources to meet the growing demand for electricity and to replace retired power plants. The study covered the period between 2002 and 2020 and examined seven interior West states, including Colorado. By adding 2670 MW renewable resources to Colorado's energy portfolio by 2020 and by employing a rigorous energy efficiency campaign, the Balanced Energy Plan projected expected annual savings of $450 million by 2020. Additional benefits of the Balanced Energy Plan include less exposure to risk of rising fossil fuel prices, lower pollutant emissions, and less water consumption for cooling in power plants.

In the analysis below, we illustrate why energy efficiency and renewable energy should be pursued instead of the proposed Comanche 3 coal-fired power plant here in Colorado.

I. A PREFERABLE METHOD TO REACH 750 MW THROUGH ENERGY EFFICIENCY AND RENEWABLE ENERGY

A. Wind and Other Renewable Energy Technologies Are Cost-competitive with Coal-Fired Power Plants

Wind power is the fastest-growing energy resource in the world. At the best sites, wind power is cost-competitive with fossil fuel generation. As of January 2004, installed capacity in the seven Interior West states was around 700 MW. New, utility-scale wind projects are coming in at less than 3 cents to 3.5 cents per kilowatt-hour (kWh) and those costs continue to decline. Wind power has environmental advantages relative to conventional generation of electricity, though it must be properly sited to avoid land-use conflicts, impacts on birds or other wildlife, and unwanted aesthetic impacts.[48] With those stipulations, The *Renewable Energy Atlas of the West - A Guide to the Region's Resource Potential* (www.energyatlas.org) found sufficient found sufficient renewable resources exist in Colorado to provide over 15 times the electricity currently consumed.

The Colorado PUC investigated the need for back up generation when it approved the 162 MW Lamar wind farm in Southeastern Colorado, in 2001. The PUC found complete

backup for the Lamar site was unnecessary and that system backup costs would be minor.[49] The PUC approved the contract for the Lamar wind project, finding it more economical and less risky for consumers than conventional fossil-fuel resources, resulting in an estimated $6.9 million in net benefits (present value 2001 dollars) for Colorado ratepayers.[50]

B. Demand Side Management and Energy Efficiency Reduce the Need for a New Coal Power Plant

Energy efficiency measures can reduce electric consumption without impairing the level or quality of the energy services provided.[51] Demand side management (DSM) and energy efficiency represent specific technologies and programs that can cost-effectively reduce the amount of electricity consumed for a given level of services such as cooling, lighting, or refrigeration. Thus, while not direct sources of energy, DSM and energy efficiency programs are considered alternative sources of energy because they reduce the need for other energy resources.[52] To illustrate, because of their ability to reduce peak load, i.e. midday summer spikes in electricity use, installing ENERGY STAR rated air conditioners can cut the need for expensive peak load energy production. Xcel Energy can gain equity by investing in a program that buys and distributes such equipment.

Despite the proven benefits of utility-sponsored DSM, Xcel Energy did not consider any specific demand side management technology or programs in its LCP application. As required by the PUC in the LCP rules, the Company will initiate a competitive solicitation process in which energy efficiency resources may bid. However, Xcel Energy did not include DSM in its resource analysis. Xcel Energy stated that it limited its modeling analysis to supply-side resources for the following reasons:

- standard information is more readily available for supply-side resources
- cost and performance characteristics of demand-side resources are relatively independent of the utility system in which they are installed.
- Inclusion of DSM technologies would have likely made optimization a problem too large to solve within the thirty-year timeframe examined.[53]

Colorado is in an opportune position to take advantage of successful DSM models. Readily available, cost-effective, energy-efficiency measures produce energy bill savings many times greater than their first cost, but are underutilized due to a lack of public awareness and utility incentives to promote the same. Many states and utilities have adopted energy efficiency programs to accelerate the adoption of cost-effective energy efficiency measures.

II. DEMAND SIDE MANAGEMENT AND ENERGY EFFICIENCY PROPOSAL

A. Expanding Energy Efficiency Programs Gives Proven Returns

There are opportunities to cost effectively save electricity in virtually every home, business, and public building in the Xcel Energy service territory.[54] All of the measures

detailed in endnote 54 below provide energy bill savings over their lifetime that is many times greater than their first cost (or additional first cost).

Because of this situation, most utilities operate energy efficiency and load management programs (also known as DSM programs) to stimulate greater adoption of cost-effective efficiency measures. National funding for utility and ratepayer-supported energy efficiency programs increased from $0.9 billion in 1997 to $1.1 billion in 2000, mainly due to adoption of "public benefits" charges and funds in a number of states. By 2003, DSM program funding further increased to approximately $1.45 billion.[55]

Leading electric utilities in the country have spent 2-3% of their revenues on DSM programs. These programs in turn have saved the equivalent of around 1% of electricity sales each year and these programs have cut electricity use approximately 5% after five years of effort, 10% after ten years, etc. The percentage reduction in consumption is greater than the percentage increase in rates to pay for the programs, meaning that participant overall energy bills decline as a result of DSM efforts.

Below are several examples of leading utility energy efficiency and DSM programs from different parts of the country, starting with Xcel Energy itself.

Xcel Energy -- Minnesota

Xcel Energy is the main investor-owned utility in Minnesota and is responsible for about half the electricity sold in the state. The utility spent about $38.5 million on energy efficiency and other DSM programs in 2002 and $42 million in 2003, approximately 2.35% of revenues from retail electricity sales. The utility estimates it saved 267 GWh/yr and cut peak demand by 121 MW due to 2002 programs, and saved 245 GWh/yr and cut peak demand by 111 MW due to 2003 programs. The 2002 energy savings were equivalent to about 0.9% of retail sales. In addition, it is estimated that the programs operated in 2002-03 will generate net benefits of $193 million over the lifetime of measures installed each year (utility perspective only). Based on these positive results, the utility receives a substantial financial bonus in addition to program cost recovery.[56]

Connecticut Light and Power and United Illuminating Co.

The two major investor-owned utilities in Connecticut spent $87 million per year on energy efficiency and load management programs as of 2001 and 2002, representing approximately 2.8% of their overall revenues from retail electricity sales. The 2001 programs saved an estimated 314 GWh/yr (1.1% of sales); the 2002 programs saved an estimated 246 GWh/yr (0.83% of sales). The estimated peak load reductions are 66 MW from 2001 programs and 99 MW from 2002 programs. The comprehensive programs include financial incentives and technical assistance for all customer classes. The programs yield economic benefits equal to

about 1.6 times costs for residential programs and 2.2 times costs for commercial and industrial programs.[57]

PacifiCorp -- Utah

PacifiCorp is a large investor-owned utility that provides close to 80% of the electricity sold at the retail level in Utah through its Utah Power subsidiary. PacifiCorp is ramping up its DSM programs in Utah and expects to spend $17 million (about 1.5% of revenues) on these programs in 2004, up from $10 million in 2003. The 2004 DSM programs are projected to save about 104 GWh/yr of electricity. PacifiCorp is continuing to develop and implement new DSM programs in Utah, and expects to spend $20-25 million per year on these programs by 2005 or 2006. The programs are very cost effective with an average levelized cost of saved energy of about $0.02/kWh.[58]

City of Austin Municipal Utility -- Texas

The City of Austin, TX municipal utility initiated a comprehensive set of DSM programs in 1992 as an alternative to investing in a 450 MW coal-fired power plant. This effort was successful, providing over 150 MW of load reduction from residential programs and over 400 MW of load reduction from commercial sector programs implemented during 1992-2000.[59] The most successful programs included incentives for high efficiency appliances, energy code enforcement, incentives for high efficiency products for the commercial sector, and green building standards (the latter two providing 73% of the savings).

Xcel Energy currently operates well-funded and cost-effective DSM programs in Minnesota. These programs have saved residential and commercial consumers money while reducing the rate of growth of electricity demand and providing environmental benefits.[60] As a result, fewer costly and controversial new power plants have been constructed. It is important to note that the Company has been given incentive to invest in DSM programs in Minnesota. It is allowed to earn a performance bonus on its investment in cost-effective energy efficiency measures. With the performance bonus, the utility earns a higher rate of return on energy efficiency investments than on building new power plants or transmission and distribution lines. In effect, legislators and utility regulators in Minnesota have made energy efficiency investments a “win-win” strategy for Xcel and its customers. This could be accomplished in the Colorado legislature as well.

Unfortunately, Xcel Energy’s achievements in the energy efficiency arena in Minnesota have not been transferred to Colorado. In Colorado, the Company operates relatively limited DSM programs as a result of a Settlement Agreement concluded and approved by the Colorado PUC in 2000. The Agreement called for the Company to reduce peak electricity demand by 124 MW over a five-year period (2001-2005), and to spend up to $75 million on DSM programs in order to meet this goal. By comparison, in Minnesota, Xcel Energy’s DSM programs reduce peak demand by 110-140 MW each year. As of

spring 2004, Xcel was on track for meeting the 124 MW goal in Colorado and was doing so cost effectively (i.e., with economic benefits that exceeded the cost of the energy efficiency measures and programs).

However, Xcel Energy has begun to phase out its Colorado DSM programs and has stated it plans to end the programs after 2005.[61] Xcel Energy did not consider continuation or expansion of its current DSM programs in the Least-Cost Resource Plan it filed on April 30, 2004.

DSM is not included in the section of the LCP application that screened different resource options. Instead Xcel has indicated it will consider DSM options in response to the all-source bidding process. However, the all-source bidding process is unlikely to stimulate very much incremental energy efficiency improvement in Xcel's service territory. First, it is too complex and costly for small-scale energy efficiency projects to participate. Second, very few larger energy efficiency projects are likely to apply or be accepted for development given the high transaction costs, the uncertain outcome, and the unfavorable and biased cost effectiveness rules adopted by the Colorado PUC.[62]

In 2002, the Colorado PUC adopted an unduly restrictive rate impact analysis for determining whether or not DSM programs are cost effective. The test considers energy efficiency measures and programs cost effective only if they minimize electricity rates.[63] However, consumers pay electricity bills – not rates. By using less energy, customers bills can go down even if their rates may increase slightly to pay for certain types of DSM programs. Many types of DSM programs are so cost-effective that customer bills will go down and rates will be reduced.[64] However, Xcel has not even proposed these types of "clearly cost-effective" programs.

Rather than abandoning a proven approach for helping consumers and businesses lower their energy bills, Xcel should expand its cost-effective DSM programs under a Total Resource Cost (TRC) or societal perspective, requesting a waiver from the rule that established the rate minimization test as the means for judging cost effectiveness. This waiver would benefit customers as a whole, unlike Xcel Energy's proposed waiver for building a very costly and polluting coal-fired power plant without proper bidding procedures. At the same time, Xcel should request financial incentives for operating effective and economically sound DSM programs in Colorado, along the lines of incentives it receives in Minnesota.

B. Energy Efficiency Proposal

We propose that Xcel Energy devote 2.35% of its electric revenues to energy efficiency and load management programs in Colorado, as it does in Minnesota. Given the experience of Xcel and many other utilities, this level of DSM program activity is justified and would result in large net economic benefits for consumers and businesses as a whole, assuming reasonable program design and implementation. This level of DSM program funding would generate about $40 million per year for DSM programs starting in 2005, given projected electricity sales and revenues.[65] Further, we assume that the

amount of DSM funding increases 1% per year after 2005 as electricity sales and revenues grow (but at a reduced rate- compared to growth without substantial funding for utility-based DSM programs).

The majority of the DSM funding should be dedicated to well-proven energy efficiency programs, including energy efficiency programs for low-income households. The money could be used for a variety of activities that save energy and reduce peak demand cost effectively, including:

- weatherization of low-income households,
- rebates for consumers who purchase energy-efficient appliances and lighting devices or undertake home retrofits,
- audits for and rebates to businesses that upgrade the efficiency of their heating, cooling, and lighting equipment,
- technology and financing assistance to industries that are interested in improving the energy efficiency of their processes,
- grants to pay a portion of the cost for energy savings projects in local government buildings and schools,
- training, certification, and outreach to increase the skills of builders, contractors, and energy efficiency service providers in the Xcel service area,
- education and promotion to increase the availability of and markets for energy-efficient products,
- market-based demand-side bidding to solicit energy efficiency projects from businesses and Energy Service Companies (ESCOs), and
- design assistance and incentives to builders and owners that construct highly energy-efficient new homes and commercial buildings.

In order to estimate the electricity savings that would result from this level of DSM activity, we consider the comprehensive and well-funded DSM programs that Xcel implemented in Minnesota during 2000-2003. Xcel spent over $150 million on these programs during this period, and saved 6.7 kWh/yr per program dollar on average. The Minnesota Department of Commerce reviewed and authenticated these results.[66] This ratio of energy savings to utility program funding is reasonable and perhaps conservative for Colorado, where much less has been done to increase energy efficiency. [67]

Table 2 shows the proposed level of program funding and resulting level of energy savings given the assumptions presented above. We estimate that the DSM programs would result in about 280 GWh/yr of electricity savings on average from program activity each year (at point of generation).[68] Cumulative DSM efforts would yield about 1,650 GWh/yr of electricity savings by 2010, and 2,510 GWh/yr of savings by 2013. These estimates include energy savings from programs in 2005, the final year of Xcel's current DSM commitment. Xcel Energy's current Colorado programs are focused on peak load reduction rather than energy savings, and are slated to end in 2005.

Table 2 – Proposed Funding for and Projected Electricity Savings from Xcel Energy DSM Programs

Year	DSM funding level (Million 2005 $)	Electricity Savings from Programs each Year (GWh/yr)	Avoided peak demand each year (MW)
2005	40	268	128
2006	40.5	270.7	129
2007	40.8	273.3	130
2008	41.2	276.1	131
2009	41.6	278.9	133
2010	42	281.7	134
2011	42.5	284.5	135
2012	42.9	287.3	137
2013	43.3	290.2	138
Totals	**$374.8 Million**	**2510.7 GWh**	**1195 MW**

In determining the cumulative energy savings, no savings degradation is assumed over time. This assumption is based on the nine years of program activity included. The proposed DSM effort continues through 2013 in this analysis to coincide with Xcel Energy's LCP acquisition period. However, most energy efficiency measures have more than a nine-year lifetime, and will keep delivering energy savings beyond 2013.[69]

This multi-year DSM effort would save half of the estimated electricity supply from Xcel Energy's portion of the proposed coal-fired power plant by the middle of 2011. The projected electricity savings by the end of 2013 is equivalent to 7.8% of total projected retail electricity sales (32,100 GWh) in 2013 in the absence of DSM programs.[70] The DSM programs would not eliminate load growth in Xcel's service territory, but they would reduce load growth to a more manageable level; i.e., from about 2.4% per year to 1.6% per year on average.

In addition to the energy savings, DSM programs provide substantial peak demand reduction. Based on the peak demand-to-energy savings ratio from Xcel's DSM programs in Minnesota as well as ratios from DSM programs in nearby states, it is reasonable to assume a peak-average demand reduction ratio of 4.0 from a comprehensive set of DSM programs in Colorado.[71] Based on this ratio, the multi-year DSM effort proposed above would result in 780 MW of peak demand reduction by 2010 and 1,195 MW of peak demand reduction by 2013, at the generator. The latter value is equivalent to about 17% of the summer peak demand Xcel is forecasting for 2013 in its latest base case forecast. This very substantial peak demand reduction would help Xcel Energy increase its average load factor and make better use of the generating capacity from which it owns and acquires power.

III. RENEWABLE ENERGY PROPOSAL

Colorado has abundant available renewable energy resources- enough wind resources alone to generate 10 times the amount of electricity the state currently consumes. Renewable energy sources, in conjunction with demand side management, can reliably account for the electricity that would be generated by a new coal-fired power plant. Renewable energy technologies such as wind, geothermal, biomass, and solar energy diversify energy supplies with clean, domestic resources; help stabilize electricity prices, hedge against future fuel price increases and volatility, and hedge against the costs of complying with potential future environmental regulation. Further, renewable energy projects create jobs- especially in rural areas, and bring new income and economic development to Colorado's energy technology businesses. Renewable energy projects provide rental income to farmers and ranchers. Finally, renewable energy is the most popular energy source according to consumer surveys.

A. Independent and Government Studies Have Demonstrated that Wind Energy and other Renewable Energy Investments can Save Consumers Money and Reliably Meet System Demands

In 2004, the research study *A Balanced Energy Plan for the Interior West (Balanced Energy Plan)*, developed by Western Resource Advocates (WRA), analyzed a mix of renewable resources (including intermittent resources) and conventional resources in the western United States that could provide sufficient electric generation capacity and adequate availability to meet customer demand in all hours of the year, for each year studied.[72] The *Balanced Energy Plan* found that increasing the renewable energy penetration level to 20 percent of generation throughout the Interior West by 2020, coupled with significant levels of energy efficiency, would result in cost savings relative to a scenario favoring increased investment in conventional fossil fuel-based power plants. This mix of renewable and conventional resources in the *Balanced Energy Plan* resulted in a level of system reliability equivalent to that achieved with a Business-as-Usual scenario.

In addition, the PROSYM modeling took into account the intermittent nature of wind, transmission conditions, and peak loads in order to analyze system reliability. The analysis showed that with significant energy efficiency additions, the *Balanced Energy Plan* reliably met power needs throughout the year, down to the hour.

Wind energy displaces the need for gas-powered plants, and in turn the need for additional base-load generation from coal plants. The *Balanced Energy Plan* conservatively assumed that the price of coal would actually decline slightly in constant dollars over the study period, through 2020.[73] To project future coal prices, WRA applied percentage changes in prices as forecasted in the U.S. Energy Information Administration's (EIA) *Annual Energy Outlook 2002* to costs at individual plants. For natural gas, WRA took 2002 delivered gas prices from the PROSYM database and adjusted them using forecast growth rates for natural gas prices from the EIA *Annual Energy Outlook 2003*. As of August 20, 2004, gas prices for September 2004 delivery on

the New York Mercantile Exchange (NYMEX) were $5.51 per million btu.[74] This represents an 11 percent increase in the last year. Analysts speculate that this trend will continue in the short and long term.

Also in 2004, Synapse Energy Economics released its study *A Responsible Electric Future.*[75] The *Synapse* study found that the nation wide electric system could reliably implement 15 percent penetration of renewable resources by 2025 at 10 percent cost savings relative to projections of the reference case, which concentrated on fossil fuel development.

A 2002 US EIA study used high estimates[76] for renewable energy technology costs and still found that a 10 percent renewable penetration amount, accomplished through a Renewable Energy Standard (RES or Renewable Portfolio Standard- RPS), could save consumers a total of $13.2 billion between 2002 and 2020.[77] The EIA report showed that under a 20% RPS, total consumer energy bills (other than for transportation) would be roughly the same as business as usual through 2006 and only $2.8 billion or 0.7% higher in 2010. By 2020, total bills would be $580 million (0.1%) lower with the 20% RPS (1999 dollars).[78] Using projections of renewable energy technology costs in line with the more realistic U.S. Department of Energy estimates, the Union of Concerned Scientists found that consumers could save money when renewable electricity production increased to 20 percent by 2020.[79]

B. IBM: A Case Study in Stabilizing Electricity Costs by Purchasing Renewable Energy[80]

Private sector investment is important to developing clean energy proposals. IBM agreed upon a corporate goal to achieve an annual 4 percent savings in electricity and fuel use. Designed to provide employees with an incentive to reduce costs, improve competitiveness and protect the environment, the corporate goal was to be met through improved energy efficiency or by the increased use of renewable energy.

In response to this goal, the energy manager at IBM's facility in Austin, Texas purchased renewable energy offered by the local utility. The price of renewable energy was projected to cost slightly higher than conventional fossil power, but unlike the price of conventional power, which fluctuated with changes in fuel prices, renewable energy was offered at a fixed rate through 2011.

IBM initially predicted that renewable power would cost $30,000 more per year, but opted for the purchase anyway due to three factors:
• The fixed-price contract provided a hedge against possible higher electricity costs due to fuel price increases.
• The cost stability helped IBM manage its energy budget.
• The renewable energy purchases helped IBM manage greenhouse gas emissions.

However, higher fuel prices soon increased and IBM's renewable energy contract created a $20,000 electricity bill savings in its first year of the program. IBM expects that fuel

prices will continue to increase and that corporate savings will be over $60,000 in 2004. These savings go directly to IBM's bottom-line profitability. Plus, IBM estimates that its renewable energy purchases will avoid roughly 8250 tons of carbon dioxide emissions per year. Possible future carbon dioxide regulation could more than double the cost savings from renewable energy purchases.

IBM's Austin experience highlights two issues regarding increased renewable energy use that can be carried over to the entire state of Colorado.

- IBM's longer-term view that considered the potential for renewable energy to hedge against fuel price risk, as well as recognition of the environmental benefits, were critical factors in making the renewable energy purchases.
- IBM's experience demonstrates how setting corporate energy management goals can lead employees to seek out and realize the cost-reduction benefits that renewables and energy efficiency have to offer.

C. Wind Energy in Xcel Energy's LCP application

Xcel Energy, in its LCP application, carved out a separate RFP for up to 500 MW of wind energy, in order to reduce rates and because of the expected short window to take advantage of a projected 1.8 cent per kilowatt hour (kWh) wind energy federal Production Tax Credit (PTC). While 500 MW is a great step forward that the authors endorse, there are several reasons why Xcel Energy can and should tap more renewable energy such that the Company can displace its "need" to self-build a new coal-fired power plant.

Constructing a new coal plant will retard renewable energy growth in Colorado by deferring the need to develop additional renewable resources. A 750 MW coal plant will be in service for more than fifty years, during which time the state's electric load will increase while prices for renewable energy sources will likely continue to decrease. Constructing a large coal plant will preclude the timely introduction of advancing technology. In short, a new coal plant means less resource choice and benefits for Colorado for more than half of this century.

Evaluating renewable energy sources involves two main criteria: the capacity credit value and the cost-effectiveness of the technology.

Capacity Credit

Xcel Energy defines the capacity credit as the amount of firm electricity a generator adds to the system, as measured by the capacity of a gas-fired electric generating station reference unit that will result in the same level of system reliability. No generator is perfectly reliable. Forced outages (accidents) and scheduled maintenance bring any generator down from its rated nameplate capacity.

Capacity credit for intermittent resources such as wind can be estimated using probabilistic analysis and standard reliability matrixes. Xcel, in its least cost plan,

indicated that wind resources would be given a capacity credit of only 10 to 20%, depending on site-specific characteristics.[81] By contrast, in 2001, the PUC and most interveners have accepted Xcel Energy's own estimate for the Lamar wind facility's capacity credit of 30%. Xcel further stated in its LCP application, with questionable justification, that 500 MW represents the maximum allowable penetration of the energy load that wind can reasonably provide. No rationale was provided for their assumption that only two plants of 80 MW size could be installed in any single year. However, Xcel has recognized studies that suggest up to twice its chosen percentage limit on wind acquisition is possible.[82]

Xcel Energy under-rated wind energy's capacity credit and reliability values in its LCP application. The Company stated "Modeling constraints used in the analysis limited the number of wind, coal, and IGCC units that could be considered…to meet system needs…[and] these constraints may have resulted in more gas-fired capacity being added than what would be considered optimal…"[83]

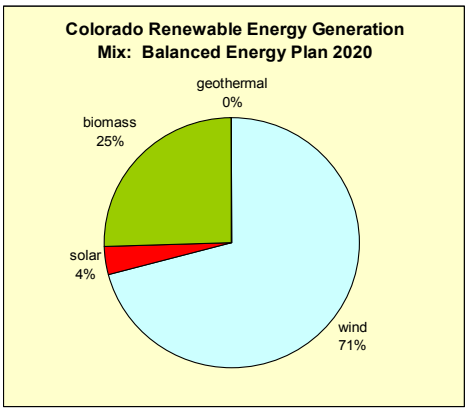
Wind energy was given a displacement value, i.e. the value it would save by displacing natural gas use, in Xcel Energy's LCP application. Wind energy is substantially cheaper than natural gas, whose costs have risen dramatically in recent years, (*see* discussion above). The displacement value wind would add to the system by lessening the need for natural gas would also lessen the need for a coal plant. The coal plant is, in part, being justified as a hedge against the Company's natural gas acquisitions of the past decade and to displace the Company's reliance on natural gas. Wind can displace natural gas at a lower cost, and come online sooner, than the proposed coal plant. The 162 MW Lamar wind farm was constructed in six months. In contrast, the coal plant could take four years or longer to construct.

The displacement value of the wind and the combined DSM effort could dramatically reduce, or even eliminate, the need for a new coal plant. In reality, wind energy decreases in cost with larger projects by taking advantage of economies of scale, similar to coal plants. Also, wind energy reliability and ease of utility operation increase with geographic dispersal of the turbines. The authors believe that wind is cost-effective even without the federal tax incentives, especially when realistic estimates are made for capacity credit, for the value of the environmental credits ("Renewable Energy Certificates" or "Green Tags"), and the hedge value against fuel price increases and future environmental compliance costs.

D. Renewable Energy Proposal

The *Balanced Energy Plan's* modeling projected that 15,410 MW of renewable energy capacity could safely and reliably be added to the region's electric resource base. While this number was roughly 10 times the amount of renewable capacity added under Business As Usual, it still represented a fraction of the region's renewable energy potential.

Figure 5: Amounts and types of renewable energy generation added under the BEP.



Colorado has begun to develop its wind resources. The only large-scale wind development project in Colorado was built near Lamar, Colorado pursuant to a competitive bid made in Xcel Energy's IRP process (the predecessor to the current LCP rules). In its first half-year of operation, the 162 MW Lamar facility is selling energy at 3.261 cents per kWh (adjusted up for inflation) and is projected to result in close to $5 million in consumer savings that "will displace higher cost generation over the cost of a year…to the benefit of customers."[84]

More recently, Xcel Energy in Minnesota selected 450 MW of wind capacity that was bid into an all-resource RFP for 1000 MW of power, based on cost alone. The wind bids came in around $0.025 per kWh compared to new coal and gas power plant bids, which were between $0.045 and $0.055 per kWh. Furthermore, Xcel stated that ancillary services to support this level of wind were less than $0.002 per kWh. Thus, it is reasonable to assume a $.02/kWh savings from wind power compared to a new coal-fired power plant.

Xcel Energy's own renewable analysis in their LCP application shows that as much as 1440 MW of wind could be cost effective by 2013, even given the Company's assumption that only 160 MW could be added in any single year.[85] A proven capacity credit similar to the Lamar wind facility (30%) would therefore yield the equivalent of over 400 MW of firm capacity for the Colorado service area from those assumptions. Although Xcel Energy performed a different capacity credit analysis (one that is not accepted industry-wide), the authors consider the 30% figure from the Lamar project to be a reasonable estimation for wind projects more generally.

Xcel Energy has already been approved to acquire up to 500 MW of wind generation to their system. However, using the Company's assumptions that only 500 MW of wind

from the Renewable Energy RFP is built, and is given *no* capacity credit, a wind alternative still compares favorably to coal.[86]

Subtracting the 500 MW wind RFP resources from the 1440 MW Xcel has shown to be cost-effective would leave roughly 940 MW of cost-effective wind generation available to be acquired by Xcel Energy, and thus could result in 300 MW of additional capacity credit for Xcel Energy's system, up to 450 MW when we include the 30 percent capacity for the full 500 MW RFP. The additional 940 MW of wind power capacity would generate 2,365 GWh per year at an average capacity factor of 30%, which is readily achievable from Class 4 wind sites in the state.

Together with the capacity and energy savings from this paper's DSM proposal, this amount of wind power would surpass the amount of electricity supply the new coal plant is estimated to provide. Adding an additional 940 MW of incremental wind power capacity would have a capital construction cost of about $940 million. This is a fixed cost, recoverable over the lifetime of the turbines. Unlike a coal plant, there are no fuel costs. Therefore, the operating costs are much lower than a coal fired power plant.

Wind power can be a prudent investment for the Company as well. For Xcel there is a substantial risk and corporate bond-rating benefit to the wind alternative – important for obtaining low interest loans. Wind plants are certainly less risky when considering potential climate change legislation and regulation. In addition, wind plants can be built in smaller increments and at a cost around $1000 per kW, while the proposed coal plant is large and its costs equal roughly twice that. A coal plant has a larger annual energy output per nameplate capacity – but there are ongoing fuel costs, and pollution costs – both of which are uncertain and expensive. After interest is included for expenses during the much lengthier construction period of a coal plant, costs increase even further. Thus, the energy from an average Colorado wind system is cheaper after including these multiple factors.

Xcel Energy also may gain the additional value of renewable energy credits (RECs) that the Company would acquire as a result of any wind energy investment or purchase.[87] RECs currently have a market value of at least 0.05 cents/kWh or $5/MWh in bulk at wholesale, and up to about 0.03 cents/kWh or $30/MWh at retail.[88] Thus, surplus REC's could be used to further reduce the cost of wind-generated electricity for Xcel Energy consumers.

Other Renewable Options

In terms of utility scale renewable resources, wind-generated electricity is generally accepted as having the lowest cost, and thus is a prudent resource choice for Colorado. However, distributed resources (e.g. rooftop photovoltaic (PV) solar panels, ground source heat pumps, fuel cells, microturbines, and small wind turbines) can provide significant benefits and should not be overlooked.

Additional renewable energy generation and equity opportunities for the Company include solar and biomass-fueled power, and combined cycle opportunities for natural gas and coal. With the exception of wind power, these technologies are usually more expensive than conventional fossil fuel generation. Overcoming cost barriers will require continued efforts to commercialize these technologies. In addition, the environmental and risk-diversification benefits of these technologies will need to be fully included in energy decisions.

As prices continue to fall, solar electricity can turn individual homes and businesses into small, distributed power stations, shaving peak demands that overload power lines and drive the need for new power plants. Xcel could initiate a solar rebate program to encourage rooftop grid-connected PV solar systems on homes and businesses. With proper net metering, Xcel Energy's peak demand could be reduced - saving all customers money. In addition, it would relieve stress on the local distribution grid that already has problems in many areas of the Xcel system. A well-designed rebate program, similar to that offered by Arizona Public Service Company ($4/peak Watt) can induce private investment. Like wind generation, PV technology has been growing internationally by more than 30% per year during the last decade. Considering Colorado's tremendous solar resource, Xcel Energy should consider positioning the Company as an early leader in adopting PV technology as part of its resource mix. This will help further drive the cost of PV down.

Biomass is a general term for organic materials that can be used to produce electricity. Biomass electricity can be produced in several ways. Landfill gas is composed primarily of methane and can be used as a power plant fuel much like natural gas. Methane also can be produced from animal wastes, turning a waste disposal problem into a valuable commodity. Crop or forest residues from community fire protection can be burned in plants dedicated to biomass fuels or can be co-fired with other fuels such as coal. Although not yet fully commercialized, a final promising option is biomass gasification technology, in which solid biomass fuels are gasified and the gas then burned in a combined-cycle power plant.

Colorado is second only to Montana in interior western states for potential biomass fuel and has several operating biomass projects. Investing in biomass-fueled power generation would provide economic and environmental benefits associated with partnering farms, landfill operations, and forest thinning companies.

IV. BENEFITS OF THE CLEAN ENERGY ALTERNATIVE

Xcel Energy can meet the electric service needs of its constituents while keeping with its philosophy of reliability, fiscal soundness, and environmental stewardship. The energy efficiency and renewable energy proposals outlined above would provide cost savings and an equivalent amount of firm energy to that which would be provided by the Comanche coal plant proposal. In addition, energy efficiency and renewable resource

programs and measures are flexible, balance risk and cost, reduce water use, benefit local economies, and reduce pollutant emissions.

- *Cost Savings related to Renewable Energy and Energy Efficiency*

DSM programs deliver significant net economic benefits because they enable utilities to purchase less fuel (and electricity) and reduce their investment in new power plants as well as transmission and distribution facilities over the lifetime of the efficiency measures. These benefits exceed the cost of the efficiency measures and the programs to stimulate their adoption. In the case of Xcel's DSM programs in Minnesota, the benefit-cost ratio was 2.9 in 2003.[89] To be more conservative, we assume the energy efficiency programs proposed for Xcel-Colorado would have an overall benefit-cost ratio of 2.4 from a total resource cost perspective. This value is typical of other well-funded utility DSM programs.[90] Also, we assume from previous models that the DSM programs would stimulate $2 of investment in efficiency measures for each Xcel program dollar.

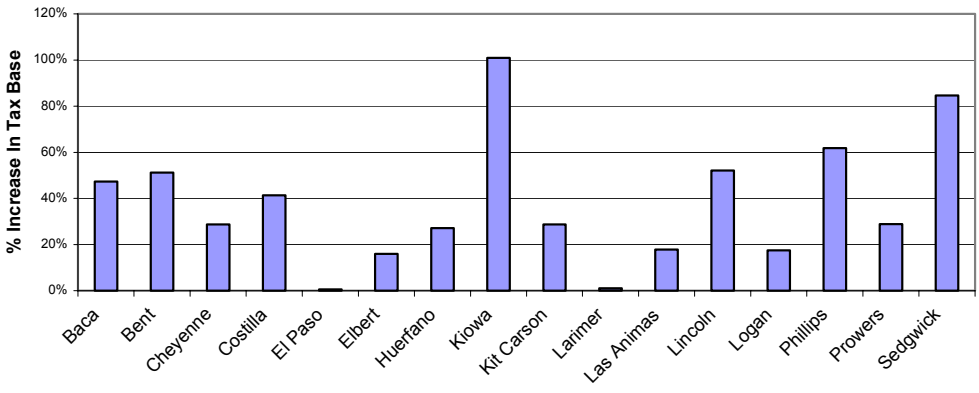
Based on these conservative assumptions, the proposed $374.8 million (2005 dollars) of DSM program activity during 2005-2013 would stimulate about $740 million of investment in energy efficiency measures. Using an overall benefit-cost ratio of 2.4, the efficiency measures would produce $1.65 billion in gross economic benefits over their lifetime. This implies $900 million in net economic benefits. To put this number in perspective, it is equivalent to about 18 months of electricity purchases by all of Xcel's residential consumers. The benefits are comparable to Xcel's share of the capital cost of the proposed Comanche 3 coal-fired power plant.

To quantify the potential economic benefits of the additional 940 MW of wind power, if the stated the cost savings advantage of wind power is about $0.02/kWh, we can multiply this by the estimated plant output each year. This calculation works out to approximately $50 million in savings per year, or $1 billion over the first 20 years of the wind capacity operation. Combined with the DSM component savings, this would yield $1.9 billion in total savings for the Clean Energy Alternative over a twenty-year period.

- *Rural Economic Growth*

Adding 940 MW of wind energy throughout Eastern Colorado would create at least $100 million in rural economic development activity during just the construction phase. The impacts of installed wind energy include a new source of annual income and tax base in rural agricultural areas of the state.

Figure 6: Increases in the tax base in Colorado's windiest counties after the installation of a 162 MW Wind Farm:



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- *Water savings*

Displacing the proposed 750 MW coal-fired power plant with savings from energy efficiency programs along with additional renewable energy (mainly wind power) would result in significant water savings. Specifically, with the hybrid wet-dry cooling technology proposed by Xcel, avoiding the coal-fired power plant altogether would save about 5,500 acre-feet (1.8 billion gallons) of water use every year.[91] Xcel states that 60 megawatts of wind-generated electricity produced through the current Windsource program annually offsets 80 million gallons of water consumption that would be used to produce same energy with conventional sources.[92] The 940 MW of wind-generated electricity in the clean energy alternative, by that calculation, would offset 1.2 billion gallons of water consumption annually in Pueblo.

- *Reduced Risk of Fuel Price Spikes*

Renewable Energy and Demand Side Management technologies cut our reliance on fossil fuels and associated potential security and environmental costs. The issue of high and volatile natural gas prices has become important on the national front. Because of the widespread use of Electric Cost Adjustment (ECA) clauses by utilities, including Xcel, increasing reliance on natural gas-fired power plants leaves consumers vulnerable to natural gas price spikes as the utility automatically passes that cost (and risk) along to its ratepayers, as it does with all fuel costs. [93]

In contrast to the volatile behavior of natural gas and wholesale electricity prices, renewable energy costs have steadily decreased. The costs of wind and solar energy are largely fixed costs, not subject to the vagaries of commodity markets. Expanding efficiency and renewable resource investments thus help shield consumers and businesses from fuel price increases and price volatility.

- *Avoided Pollutant Emissions*

Given the proposed plant design, the Comanche 3 coal-fired power plant would emit 9.0 million tons of CO2, 4,400 tons of SO2, 3,000 tons of NOx, and 0.22 tons of mercury per year, year after year. All of these emissions would be avoided by investing in energy efficiency and renewable energy instead of building and operating the coal plant.[94] In addition, the proposed Comanche 3 power plant would produce 190,000 tons of fly ash, 50,000 tons of bottom ash, and 50,000 tons of flue gas desulferization material per year. Disposal of all of these solid waste materials would be avoided by not building and operating the new coal-fired power plant.

- *Employment Impacts*

Constructing and operating a large new coal-fired power plant supports fewer jobs than displacing this plant with energy efficiency programs and renewable energy development. Coal production and coal-based electricity generation are capital intensive, not labor intensive. Also, a large portion of the energy bill savings from energy efficiency programs will be spent in sectors of the economy such as the services and retail sectors that are much more labor-intensive than coal mining and electricity generation. Based on a previous analysis of these factors, we estimate that saving 2,510 GWh/yr of electricity by 2013 through DSM programs would result in a net increase of roughly 1,200 jobs.[95] These jobs would be dispersed throughout the Xcel service area.

CONCLUSION

Building the proposed Comanche 3 coal-fired power plant has a number of serious drawbacks including its high cost, adverse impacts to the public health of Pueblo in particular, and risks of cost escalation due to future action to limit the emissions causing global warming. Fortunately, there is a better alternative to building the new coal-fired power plant: expanding energy efficiency (DSM) programs and increasing investment in proven renewable energy technologies.

A combination of expanded energy efficiency programs and renewable energy investments would provide net economic benefits (i.e., lower electricity bills) for Xcel's customers, relative to constructing the coal-fired power plant. These are both less costly resource options and should be supported by the PUC, as well as Xcel Energy customers who do not wish to shoulder the burden for a costly, risky and dirty coal-fired plant.

Displacing the Comanche 3 coal-fired power plant does not exhaust the potential for cost-effective energy efficiency improvements and renewable energy development in Colorado. The following conclusions can be drawn if energy efficiency and renewable energy projects are deployed as presented in the *Balanced Energy Plan*:

- No new coal-fired power plants would be needed in Colorado by 2020.
- Cost effective energy efficiency measures can reduce Colorado's electric load by about 30 percent by 2020, relative to Business-as-Usual.
- Colorado would be far less dependent on natural gas for generating electricity under the Balanced Energy Plan relative to Business as Usual, thereby reducing the state's exposure to volatile natural gas prices.
- Renewable energy (excluding hydropower) would account for about 21 percent of the electricity generated in Colorado in 2020, and, of this renewable energy, the most important resources in Colorado would be wind and biomass, including co-firing biomass at existing coal plants.
- Sulfur dioxide and nitrogen oxide emissions from Colorado power plants would be 27 to 28 percent lower by 2020 under the Balanced Energy Plan compared to the Business-as-Usual scenario.
- Carbon dioxide emissions from Colorado power plants would be 42 percent lower under the Balanced Energy Plan than under Business as Usual by 2020.
- Although the Balanced Energy Plan study did not break out cost savings by state, Colorado could expect to reduce the cost of meeting the demand for electric energy services by about $450 million dollars in 2020, in constant year 2000 dollars, relative to Business as Usual.[96]

In conclusion, energy efficiency and renewable energy resources are preferable to constructing a new 750 MW coal-fired power plant. Energy efficiency and renewable energy are a "better buy" and have other advantages including being cleaner, less water-intensive, more labor-intensive, and less risky. Xcel's shareholders might benefit more from construction of a large new coal-fired power plant, but Colorado's citizens would not. The choice should be clear—it is now up to Xcel Energy and the PUC to act in the public interest.

ENDNOTES

[1] Xcel Energy Least Cost Plan Application, Supplemental Direct Testimony of David L. Eves, at. 10-11.
[2] Through its subsidiary, in Colorado Xcel Energy also does business as the Public Service Company of Colorado.
[3] Colorado Public Utilities Commission website, *at* www.dora.state.co.us/puc (last visited June 28, 2004).
[4] PUC LCP Rules, 4 CCR § 723-3-3601.
[5] Public Service Company of Colorado's "Least Cost Plan Proposal," submitted to the PUC April 30, 2004 pursuant to the PUC Least Cost Planning Rules, 4 CCR 723-3-3600-3615. (hereafter, "LCP application.")
[6] Xcel Energy Corporation, *Notice of Increase in the Electric Rates of Public Service Company of Colorado*, April 30th 2004 (attachment to LCP application).
[7] Len Boselovic, *Coal costs shock utilities*, Pittsburgh Post-Gazette Friday, August 13, 2004, *at* http://www.post-gazette.com/pg/04226/360980.stm
8 For Xcel's credit rating arguments, *See generally*, LCP application Testimony of Frederick Stoffel.
[9] PSCo's portfolio is currently 48% natural gas-fired generation capacity, all of which is purchased through power purchase agreements (PPA's). PSCo predicts the costs of natural gas to increase. LCP application, *at* 1-18, 43, 79-82.
[10] James Hickey, Jr., Suedeen Kelly, Marla Mansfield, Joseph Tomain, and Donald Zillman, *Energy Law and Policy for the 21st Century,* Rocky Mountain Mineral Law Foundation (2000), at 9-8.
[11] This is only one of several assumptions made by Xcel Energy in their LCP that computed their energy acquisition scenarios that must be carefully scrutinized by the PUC. Other potentially flawed assumptions include the cost estimates of renewable energy and coal gasification technologies, a shortage of transmission lines for tapping the state's wind power potential, the lack of any DSM analysis, and the fixed capital construction costs of these facilities.
[12] PSCo's decision to use a self-build option rather than a competitive acquisition process hinges largely on their assertions that coal plant development does not fit within the framework of competitive acquisition processes, and this creates considerable uncertainty that coal can win a bidding process and ultimately be developed and constructed, even when resource planning analysis concludes it is a preferred resource. LCP application, *at* 1-104.
[13] Return on Investment is the amount of profit that a utility is allowed to recover from ratepayers to pay off its reasonable costs for construction of facilities.
[14] The *return* which a utility is constitutionally entitled to earn relates only to its property that is employed in the public service. *Bluefield Water Works Co. v. Public Service Commission,* 262 U.S. 679, 43 S.Ct. 675, 67 L.Ed. 1176 (1923). In that regard, the Supreme Court has held that it is only when a utility's property is "*used and useful* " in the public service does the federal constitution require its inclusion in the rate base, upon which the return is calculated. *Federal Power Commission v. Natural Gas Pipeline Co.,* 315 U.S. 575, 62 S.Ct. 736, 86 L.Ed.1037 (1942). A refined version of the same principle can be found in *Columbus Gas & Fuel Co. v. Public Utilities Commission,* 292 U.S. 398, 54 S.Ct. 763, 78 L.Ed. 1327 (1934). There, the Supreme Court held that a utility's rate base need not include assets not presently in use, "*unless the time for using them is so near that they may be said, at least by analogy, to have the quality of working capital.*" *Id.* at 406. *see Barasch v. Pennsylvania Public Utility Com'n*, 532 A.2d 325, 335-336 (1987).
[15] LCP application, *at* 1-104.
[16] LCP application, *at* 1-103.
[17] *See* LCP application, Direct Testimony and Exhibits of Frederick Stoffel, at 15, 16,18, 19, 21.
[18] Figures from LCP application, "Direct Testimony and Exhibits of Richard A. Keyser, April 30, 2004," *at* 11.
[19] PSCo has extolled the virtues of its competitive bidding process. When instructed by the PUC during review of their 1999 Integrated Resource Plan to make a good faith bid to Lamar Energy for wind power, "PSCo stressed the importance of preserving the integrity and credibility of the competitive bidding process." Decision No. C01-295 (March 28, 2001), ¶ II.J.3, page 53.
[20] *See* LCP Rule 723-3-1310(b)
[21] LCP application, Sec. 1.11, *at* 1-101.
[22] LCP application, Sec. 1.11, *at*. 1-103 – 1-104.
[23] LCP application, *at* 1-102.

[24] Particulate pollution from power plants has been attributed to 115 premature deaths, over 3,600 asthma attacks, and over 21,000 lost work days in Colorado, according to a report prepared by Abt Associates, a consultant to the U.S. EPA. Abt Associates, "Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefits of Alternative Emission Reduction Scenarios". June 2004.

[25] According to the U.S. Environmental Protection Agency (EPA), in 2002, industrial facilities in Colorado reported releasing 6.2 million pounds of carcinogens, ranking the state **24th** in the country. Facilities in Colorado reported releasing over 5.8 million pounds of developmental toxicants, ranking the state **18th** in the country. Developmental toxicants are chemicals that can impede the proper physical and mental development of young children. Facilities in Colorado reported releasing 5.6 million pounds of reproductive toxicants, ranking the state **13th** in the country. Reproductive toxicants are chemicals with the potential to impair the male or female reproductive system, leading to sterility, spontaneous abortion or stillbirth. EPA TRI Report, June 2004.

[26] "Estimated Prevalence and Incidence of Lung Disease by Lung Association Territory", American Lung Association, 2001.

[27] Ibid.

[28] Conrad Schneider, *Dirty Air, Dirty Power*, CLEAN AIR TASK FORCE (2004), at 12.

[29] See InsideEPA.com, Friday, January 30, 2004. Emissions calculated by applying emission rates in Environmental Working Group's "Mercury Falling" report to heat input reported in EPA CEMS data for 2000. (>5.8 parts per billion – the level at which the risk of poor brain development is doubled).

[30] "UN Says Global Warming Kills 150,000 a Year." Environmental News Service. Dec. 14, 2003. www.ens-newswire.com/ens/dec2003/2003-12-12-10.asp

[31] *See* U.S. Environmental Protection Agency, Enforcement and Compliance Information Online, *available at* http://www.epa.gov/cgi-bin/ideaotis.cgi, last visited June 24, 2004.

[32] Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. **Fair treatment** means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. **Meaningful involvement** means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected. *See* United States Environmental Protection Agency website, *at* http://www.epa.gov/compliance/environmentaljustice/ (last visited 8/20/04).

[33] Letter from United States Environmental Protection Agency, Region VIII, to Pueblo Citizens for Clean Air and Water, the Sierra Club, and Smart Growth Advocates, April 22, 2004, re: Pueblo Environmental Justice and Permitting Issues.

[34] Letter from Citizens for Clean Air & Water in Pueblo/Southern Colorado, Sierra Club & Smart Growth Advocates to the EPA, March 15, 2004.

[35] Tegen, Suzanne. Statewide economics of wind compared to gas and coal: a work in progress. For the National Renewable Energy Laboratory. Published in the Proceedings for the Global Windpower Conference 2004. Chicago, Illinois.

[36] An acre-foot of water is equal to about 326,000 gallons.

[37] Colorado Preliminary Population Forecasts, Colorado Division of Local Government, June, 2003.

[38] All IPCC figures and tables mentioned in this paper are available at www.ipcc.ch. The IPCC consists of over 2,000 of the top climate change researchers in the world, and as a result, its reports represent the best judgment of the world scientific community on the science, impacts, economics and options for mitigating and adapting to climate change.

[39] Summary for Policymakers: A Report of Working Group I of the Intergovernmental Panel on Climate Change, *IPCC Third Assessment Report – Climate Change 2001*. Explaining this warming trend, the IPCC concluded "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities."

[40] *Climate of 2003 Annual Review*. National Climatic Data Center, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. Jan. 15, 2004.

[41] U.S. Environmental Protection Agency, *available at* http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BNQ7Z/$File/
[42] Financial Wire, *'Gang of Eight' Attorneys General Take On Electric Companies, Global Warming* , Investors Business Daily, August 9, 2004, *available at http://www.investors.com/breakingnews.asp?journalid=22565500&brk=1*
[43] *Climate Change Activities in the United States: 2004 Update*. Arlington, VA: Pew Center on Global Climate Change. www.pewcenter.org.
[44] *Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size*. Snowmass, CO: Rocky Mountain Institute. 2002.
[45] Western Resource Advocates, *A Balanced Energy Plan for the West, (2004), at 27. (hereinafter WRA)*
[46] Land and Water Fund of the Rockies, 2002: *The Renewable Energy Atlas of the West, A Guide to the Region's Resource Potential,* Energy Information Administration (2003), Electric Power Annual (2002) DOE/EIA-0348 (2002).
[47] *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest.* Boulder, CO: Southwest Energy Efficiency Project. Nov. 2002.
[48] *See* WRA, *supra* note 45, at 18
[49] *See* Public Utilities Commission website, *available at* http://www.dora.state.co.us/puc/new.htm#dated
[50] Colorado Public Utilities Commission, Decision No. C02-1122, (2002) at 9.
[51] *See* WRA, *supra* note 45, at iii.
[52] James Hickey, Jr., Suedeen Kelly, Marla Mansfield, Joseph Tomain, and Donald Zillman, *Energy Law and Policy for the 21st Century,* Rocky Mountain Mineral Law Foundation (2000), at 13-2.
[53] LCP application, *at* 1-78, 79.
[54] Readily available, cost-effective energy efficiency measures include high efficiency, ENERGY STAR® appliances and air conditioners, compact fluorescent lamps and ENERGY STAR light fixtures, sealing leaky air distribution ducts, high efficiency ENERGY STAR windows, energy-efficient heating, air conditioning and lighting system for commercial buildings, and high efficiency motors and control systems for industries.
[55] York, D. and M. Kushler. *State Scorecard on Utility and Public Benefit Energy Efficiency Programs: An Update.* Washington, DC: American Council for an Energy-Efficient Economy (ACEEE). Dec. 2002. Also, "State Energy Efficiency Programs Keep Growing, in Contrast to Federal Retreat." Press Release. ACEEE, April 25, 2003. http://aceee.org/press/0304steeprog.htm.
[56] See *Minnesota Energy Planning Report 2001.* Department of Commerce, St. Paul, MN, 2002. Also, personal communication with Chris Davis, MN Department of Commerce, July 2004. www.state.mn.us/mn/externalDocs/Energy_Planning_Report_121602022402_2002PlanningRpt.pdf
[57] See *Energy Efficiency: Investing in Connecticut's Future.* Energy Conservation and Management Board, New Britain, CT. Jan. 2004. www.state.ct.us/dpuc/ecmb
[58] *Integrated Resource Plan 2003.*PacifiCorp, Portland, OR. 2003. Also, Howard Geller, personal communiciation with Mike Koszalka, PacifiCorp, Portland, OR, July 8, 2004.
[59] *See* E-SOURCE Consulting Group, "Austin Energy Conservation Study 2000-2001 (April 4, 2001).
[60] Xcel Energy's 2003 electricity DSM programs in Minnesota reduced peak electric load by 111 MW, saved 245 GWh/yr of electricity consumption, and had a benefit-cost ratio of 2.90 from a total resource perspective. See *2003 Minnesota Natural Gas and Electric Conservation Improvement Program Status Report & Associated Compliance Filings.* Xcel Energy, Minneapolis, MN, April 1, 2004.
[61] Presentation by Xcel Energy at the DSM Roundtable Discussion, Denver, CO, April 26, 2004. Also, personal communication with Grey Davis, Xcel Energy, Minneapolis, MN, April 2004.
[62] In 2002, the Colorado PUC modified the rules concerning DSM cost effectiveness, shifting from a Total Resource Cost (TRC) perspective to the minimization of net present value of rate impacts. This was done at Xcel's request. The TRC test means that energy efficiency measures are cost effective if their total economic benefits (excluding environmental and social benefits) exceed their costs; i.e., if they lower total energy bills and the cost of energy services for customers as a whole. Thus, most states use the TRC or societal perspective as the sole or primary test for judging the cost effectiveness of energy efficiency measures and programs.
[63] In effect, Xcel Energy is planning to abandon proven utility-based DSM programs (proven in Minnesota, Colorado, and elsewhere). In return, Xcel is proposing to implement an unproven DSM acquisition strategy along with a very restrictive and biased cost effectiveness test. Together, this is likely to result in little or no

utility support for customer-based efficiency and load management projects. This may serve the interests of Xcel's shareholders by increasing the need for new power plants (i.e., additions to the company's rate base), but it does not serve the interests of consumers in Colorado.

[64] In fact, the entire set of energy efficiency and load management programs implemented by Xcel Energy in Minnesota in 2003 passed the RIM test. Xcel's 2003 electricity DSM programs in Minnesota had a benefit-cost ratio of 1.09 using the RIM test, compared to a benefit-cost ratio of 2.90 using the total resource cost test. See Ref. 59.

[65] These revenue and DSM funding estimates are derived from base rates only; fuel cost adjustment charges are not included in the determination.

[66] The energy savings are at the generator, meaning that transmission and distribution losses are added to the end-use savings. Personal communication with Chris Davis, Minnesota Department of Commerce, St. Paul, MN, July 2004**.**

[67] The Minnesota DOC is responsible for DSM program oversight and also determines the level of financial incentive to award the utility. Xcel Energy noted in its biennial energy efficiency program plan for Minnesota in 2005-2006 that "Because Xcel Energy has run comprehensive conservation and load management programs for well over a decade, the potential to achieve cost effective conservation and load management is lessening." Nonetheless, Xcel proposed saving goals of 207 GWh/yr from 2005 programs and 208 GWh/yr from 2006 programs, indicating that there is still significant cost effective savings potential even in Minnesota. See *2005/2006 Biennial Plan Minnesota Natural Gas and Electric Conservation Improvement Program.* Xcel Energy, Minneapolis, MN. June 1, 2004.

[68] Savings at point of generation.

[69] *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest.* Boulder, CO: Southwest Energy Efficiency Project. Nov. 2002.

[70] This projection assumes 2.0%/yr growth in retail electricity sales during 2002-2013 in the absence of new DSM programs, consistent with the base case load forecast in Xcel's recent resource plan.

[71] Some DSM programs such as air conditioner cycling provide a very high ratio of peak demand reduction to energy savings; others such as promoting high efficiency residential appliances have a relatively low ratio. The ratio of 4 MW of peak demand reduction per 1 MW of average demand reduction is reasonable for a broad mix of cost-effective DSM programs.

[72] Western Resource Advocates, *A Balanced Energy Plan for The West* (2004), *available at http://www.westernresources.org/energy/BEP/WEB_pdfs/BEP_West_lwres.pdf*

[73] By contrast, natural gas prices are assumed to rise over the study period, ending up in 2020 at around $5 per million BTUs in year 2000 dollars.

[74]Gargi Chakrabarty, *Crude oil prices reach record*, DENVER ROCKY MOUNTAIN NEWS,August 20, 2004, *at http://www.rockymountainnews.com/drmn/business/article/0,1299,DRMN_4_3110474,00.html*.

[75] Synapse Energy Economics, *A Responsible Electricity Future: an Efficient, Cleaner and Balanced Scenario for the US Electricity System,* National Association of State PIRGS (July 2004).

[76] The DOE Interlaboratory Working Group found that EIA significantly overestimates the cost of adding renewables to the system. The EIA: 1) Used higher cost and worse performance assumptions for most renewable technologies than recent experience and projections by the utilities' Electric Power Research Institute and DOE; 2) Arbitrarily increased the capital cost of wind, biomass, and geothermal technologies by up to 200% in a given region after a fairly small amount of the regional potential is met; 3) Limited the penetration of variable output resources like wind and solar power to 15% of a region's electricity generation; in parts of Germany, Denmark and Spain, wind power is already providing more than 20% of total electricity generation; and 4) Assumed that renewable energy generation will cost 4 to 5 cents more per kilowatt-hour than electricity from natural gas plants between 2010 and 2020. See Interlaboratory Working Group, Scenarios for a Clean Energy Future (Oak Ridge, TN; Oak Ridge National Laboratory and Berkeley, CA; Lawrence Berkeley National Laboratory), ORNL/CON-476 and LBNL-44029, November 2000, *at* http://www.ornl.gov/ORNL/Energy_Eff/CEF.htm.

[77] Union of Concerned Scientists, *Easing the Natural Gas Crisis, (2003) available at http://www.ucsusa.org/publications/catalyst.cfm?publicationID=715*

[78] Energy Information Administration, Analysis of Strategies for Reducing Multiple Emissions from Electric Power Plants: Sulfur Dioxide, Nitrogen Oxides, Carbon Dioxide, and Mercury and a Renewable Portfolio Standard, SR/OIAF/2001-03, June 2001 at http://www.eia.doe.gov/oiaf/servicerpt/epp/pdf/sroiaf(2001)03.pdf.

[79] *Id.*
[80] WRA,*supra* note 45, at 65.
[81] LCP application, *at* 1-95:
"In the Strategist model, the generic wind resource was given a 10% capacity credit a (i.e., 10% of the nameplate capacity counted towards the reserve margin target) and was allowed to be added in years when sufficient capacity already existed on the system, if, the added wind resulted in cost savings (i.e., superfluous units were allowed)."
From LCP, Part 2 of 4. Renewable Energy RFP. Appendix C. General Planning Assumptions
" Capacity Credit for Intermittent Proposals"
Wind Resources. Based on an evaluation of historical summer wind energy production at Ponnequin and Ridge Crest wind sites, PSCo will assume that new wind proposals will contribute 15% of their nameplate capacity to PSCo's capacity requirements. This capacity credit may be adjusted based on actual operating experience during the summer of 2004, taking into consideration the summer production at the new Colorado Green site."
[82] Testimony of James Hill before the Colorado Public Utilities Commission, August 4, 2004.
[83] LCP application, *at* 1-96.
[84] Direct Testimony of Ronald N. Darnell before the Federal Energy Regulatory Commission, pp. 17-28, June 2003.
[85] LCP application, *at* 1-92, 1-93.
[86] In supplemental testimony, Xcel Energy states that they are considering assessing capacity credit for the wind energy RFP at anywhere between 10 and 20 percent of nameplate rating. This rating is still below that proven by the Lamar facility. *See* LCP application, Supplemental Testimony of David L. Eves, at 10-11.
[87] Renewable energy credits are the market price paid for the environmental attributes stemming from renewable power generation.
[88] *See Evolution Markets, at* www.evolutionmarkets.com (last visited 8/25/04)
[89] This benefit-cost ratio is based on the total resource cost test which includes the participant contribution to the cost of purchasing and installing efficiency measures. See Ref. 62 above.
[90] Kushler, M., D. York, and P. Witte. *Five Years In: An Examination of the First Half-Decade of Public Benefits of Energy Efficiency Policies,* Washington, DC: American Council for an Energy-Efficient Economy, April 2004.
[91] This is the water savings from avoiding the full 750 MW plant, not just Xcel Energy's portion.
[92] XcelEnergy's Energy Update, August 2004.
[93] These estimates assume the base-load power plant operates at a 70% average capacity factor and there are 7% T&D losses. Xcel's DSM programs in Colorado are reducing peak demand at an average program cost of about $460 per kW. These benefits are derived from reduced investment in new power plants, associated transmission and distribution equipment, fuel and operating and maintenance cost savings, and so forth. In addition, natural gas prices are expected to remain at high levels for years because of depletion of the gas resource base in North America and tight gas markets. It would not be surprising to see the price of coal increase in the future as well as a result.
[94] Xcel has proposed offsetting the SO2 and NOx emissions at the Comanche 3 plant by adding some additional pollutant emissions controls on Comanche units 1 and 2. However, these additional controls can and should be added to the older units even if the Comanche 3 plant is not built (consistent with action initiated by the U.S. EPA), meaning even greater environmental benefits through the combination of cleaning up units 1 and 2 along with avoiding construction and operation of unit 3.
[95] SWEEP estimated that saving 22,350 GWh/yr statewide by 2020 would result in a net increase of 12,200 jobs. Based on these values, saving 2,510 GWh/yr would result in a net increase of 1,165 jobs. See *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest*. op cit.
[96] Calculated by multiplying the region-wide savings of $2 billion by Colorado's portion of the region's electric load in 2020 under either the Balanced Energy Plan or Business as Usual.