BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO
PROCEEDING NO. 21A-0141E

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF ITS 2021 ELECTRIC RESOURCE PLAN AND CLEAN ENERGY PLAN

POST HEARING STATEMENT OF LESLIE GLUSTROM

January 28, 2022

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LWG-5	21AL-0317E DAB-33, Revenue Requirement for Pueblo Unit 3 Under the Settlement
LWG-6	21A-0141E CRES3-33 Discovery Response Asset Recovery Comparisons
LWG-7	October 2021 Email Exchange with Jackie Joyce, CDPHE on Mercury Emissions from the Pueblo Unit 3 Coal Plant
LWG-8	2013 Report "Warning: Faulty Reporting of US Coal Reserves"
LWG-9	Wyoming Coal Mine Reclamation Obligations from Wyoming Department of Environmental Quality (Sept 2021)
LWG-10	NARUC/NRRI Insights Paper New Resource Planning Options to More Fully Capture the Benefits of Flexibility

I. INTRODUCTION

Leslie Glustrom, a Public Service Company of Colorado ("PSCo" or "Xcel") customer and stockholder and long-time Colorado Public Utilities Commission ("PUC") intervenor and participant[1] hereby files this Post-Hearing Statement ("PHS") in the above captioned proceeding at the Colorado Public Utilities Commission ("PUC") related to Public Service Company of Colorado's 2021 Electric Resource Plan ("ERP").[2]

[1] Ms. Glustrom has been an intervenor in the following proceedings and has participated extensively in many other proceedings.

05A-072E Comanche-Daniels Park Transmission
07A-107E/07A-196E 2013 Contingency Plan/Tri-State Gas Contracts
07A-421E Pawnee Smoky Hill Transmission
07A-521E Interruptible Service Option Credit
07A-447E Xcel 2007 Resource Plan
07A-469E Fort St. Vrain Turbines
08S-520E Xcel 2009 Rate Increase
09AL-299E Xcel 2010 Rate Increase
09A-772E Xcel 2010 Renewable Energy Compliance Plan and Windsource
10A-124E Xcel Smart Grid CPCN
10A-377E Xcel Amendment to 2007 Resource Plan
10M-245E Clean Air Clean Jobs
11A-135E Xcel Solar Rebate Program Restart
11A-325E Xcel Pawnee Emissions Control Plan
11A-418E Xcel 2012 Renewable Energy Standard Compliance Plan
11A-869E Xcel 2011 Resource Plan
11A-917E Xcel Hayden Pollution Control Plan
11A-1001E Smart Grid City Cost Recovery
19AL-0268E PSCo 2019 Rate Case

[22] Ms. Glustrom was not granted intervention in this proceeding (in large part because Commission Advisory Counsel Paul Gomez seems to have defined a primary goal of his job as keeping the ***public*** out of the ***Public*** Utilities Commission…) so this Statement reflects Ms. Glustrom's comments as a citizen—albeit a citizen who has more experience at the Colorado PUC than most of the other formal intervenors in this proceeding. As a citizen commenter, Ms. Glustrom did not feel obligated to stay within the normal page limits for formal Statements of Position. This filing is Ms. Glustrom's major filing in this proceeding so it is significantly longer than a formal Statement of Position. This Statement largely relies on the formal evidence in this proceeding, but also introduces highly credible documents (for example PSCo annual 10-K filings or Xcel PPTs to investors or PSCo filings in other proceedings) for consideration by everyone who cares about the pace, price and reliability of Colorado's energy transition and the future livability of the only planet we know of that supports life….

Commissioner Gilman promised to read submissions from the public.
I pray that she is true to her word and the other two Commissioners
also take the time to read this filing.
I guarantee you will learn things you didn't know—
And besides there are lots of pictures…
and hopefully you can avoid making the dunderheaded mistakes that previous Commissions have made—starting with Pueblo Unit 3,
moving on to Clean Air Clean Jobs and on and on—
driving up our rates with imprudent investments in fossil fuel generation
(that Xcel now assumes their customers will pay off… and)

unnecessarily adding "fuel to the fire" of the climate crisis!!

PLEASE…PLEASE…

"DARE" TO READ THIS…PLEASE….

So I know it is long—but I've been at this a looong time

(longer than almost anyone currently active at the PUC) and I "ain't" dumb…

Besides, you've likely read thousands of pages from Xcel…

Please at least read the Table of Contents and a few of the parts and look at the figures…

PLEASE!!

And hopefully you'll consider that since I've been at this for close to 20 years and have been vindicated time and time again that maybe—just maybe—I know some things that are worth knowing…just maybe…

Many points will be well briefed by other parties—Ms. Glustrom will focus on points not being made or not being given enough attention by other parties. [3]

Before beginning, Ms. Glustrom, a resident of Boulder, Colorado would like to note—for the record—that City of Boulder testimonies, positions and statements submitted in this

[3] Ms. Glustrom apologizes for any roughness in this filing. Her dear baby grandson "Julien" died in December 2021 and it is still hard to concentrate on work and she has been very busy taking care of her family in many ways.

proceeding were not done with any significant or meaningful engagement of the Boulder community—rather the filings in this proceeding from the City of Boulder represent positions of a few City Staff working largely in isolation from the community. This is important because previously the City of Boulder was seen as a leader in the effort to address climate change. While City Staff appear to share the desire to address the climate crisis, their positions were almost completely uninformed by the community they work for—something that engaged members of the community are very concerned about and will be working with Boulder City Staff to get changed.

II. LEGAL BACKGROUND

At this stage in a PUC proceeding, the arguments can get complex and confusing, so it is always helpful to remember the direction given to the PUC by Colorado law and regulation. Key statutory and regulatory provisions are provided below to help guide the Commission's thinking.

A. The Commisison is Mandated to Ensure that Rates are Just and Reasonable (C.R.S. § 40-3-101(1))

Colorado law mandates that the Commission shall ensure that rates are "just and reasonable" as called for in Colorado Revised Statutes (C.R.S.) § 40-3-101(1) as reproduced below in relevant part.

> **CRS 40-3-101(1) All charges** made, demanded, or received by any public utility for any rate, fare, product, or commodity furnished or to be furnished or any service rendered or to be rendered **shall be just and reasonable**. Every unjust or unreasonable charge made, demanded, or received for such rate, fare, product or commodity, or service is prohibited and declared unlawful. (Emphasis added.)

While this is an Electric Resource Plan proceeding, the decisions made in this proceeding will have a strong impact on the bills that will be sent to Xcel's Colorado customers in future years,

so the mandate to ensure that rates and charges by the monopoly utility will be "just and reasonable" is an important one to keep in mind when resource acquisition decisions are made. In particular, there is good reason to believe that additional attention to batteries, solar plus storage and demand-side solutions can help reduce the need for additional gas capacity and can very likely do it at a much lower cost than acquiring hundreds of MW of gas turbines that will be used for only a few hours a year. It is not "just and reasonable" to pay Xcel full return on gas turbines that sit idle over 99% of the year when we have cleaner, lower cost options available.

B. The Commission is Mandated by Colorado Law to Ensure that Utility Facilities Promote Public Safety and Health (C.R.S. §40-3-101(2))

Colorado law also mandates that the Commission shall ensure that utility facilities promote the public health and safety as called for in C.R.S. §40-3-101(2), reproduced below.

> **CRS 40-3-101 (2) Every public utility shall** furnish, provide, and maintain such service, instrumentalities, equipment, and **facilities as shall promote the safety, health,** comfort, and convenience of its patrons, employees, and the public, and as shall in all respects be adequate, efficient, just, and reasonable. (Emphasis added.)

The mandate to the PUC to ensure utility facilities promote public health and safety has become increasingly important as we see the numerous serious impacts resulting from a warming climate—most recently the over 1000 homes with a value over $500 million that were incinerated in the Marshall fire in Superior and Louisville, west of Denver on December 30, 2021.[4] Beyond carbon emissions, coal plants emit large amounts of other pollutants including mercury, arsenic, lead, particulates, oxides of sulfur and nitrogen and acid gases. These clearly are not promoting the safety and health of the public!!

[4] For over 1000 homes with a value of over $500 million destroyed in the Marshall fire in the western suburbs of Denver, see https://coloradosun.com/2022/01/06/marshall-fire-how-many-homes-destroyed/

C. The Commission is Mandated by Colorado Law to Correct Abuses and Do All Things Which Are "Necessary or Convenient" to Regulate Public Utilities (C.R.S. §40-3-102)

The Commission has broad authority to correct abuses and to do everything necessary to regulate Colorado's monopoly utilities like Xcel as made clear in C.R.S. §40-3-102

> **C.R.S. 40-3-102** The power and authority is hereby vested in the public utilities commission of the state of Colorado and it **is hereby made its duty to** adopt all necessary rates, charges, and regulations to govern and regulate all rates, charges, and tariffs of every public utility of this state **to correct abuses**; to prevent unjust discriminations and extortions in the rates, charges, and tariffs of such public utilities of this state; to generally supervise and regulate every public utility in this state; **and to do all things**, whether specifically designated in articles 1 to 7 of this title or in addition thereto, **which are necessary or convenient in the exercise of such power,** and to enforce the same by the penalties provided in said articles through proper courts having jurisdiction; except that nothing in this article shall apply to municipal natural gas or electric utilities for which an exemption is provided in the constitution of the state of Colorado, within the authorized service area of each such municipal utility except as specifically provided in section 40-3.5-102. (Emphasis added.)

While it is natural for the Commission and Commission Staff to want to avoid a "fight" with a powerful utility like Xcel, it is critical that the Commission and its Staff take its regulatory mandates seriously in order to protect Xcel's Colorado customers from Xcel's monopoly power and its tendency to make imprudent decisions that will drive up its profits.

Specifically, Xcel's Colorado customers have been paying 100% of returns and profits for the Pueblo Unit 3 coal plant when it has been and will be delivering a lot less than 100% of the previously projected power. This is one of many "abuses" that should be corrected and the foundation should be laid to correct this and other abuses in this Electric Resource Plan proceeding, as described further below.

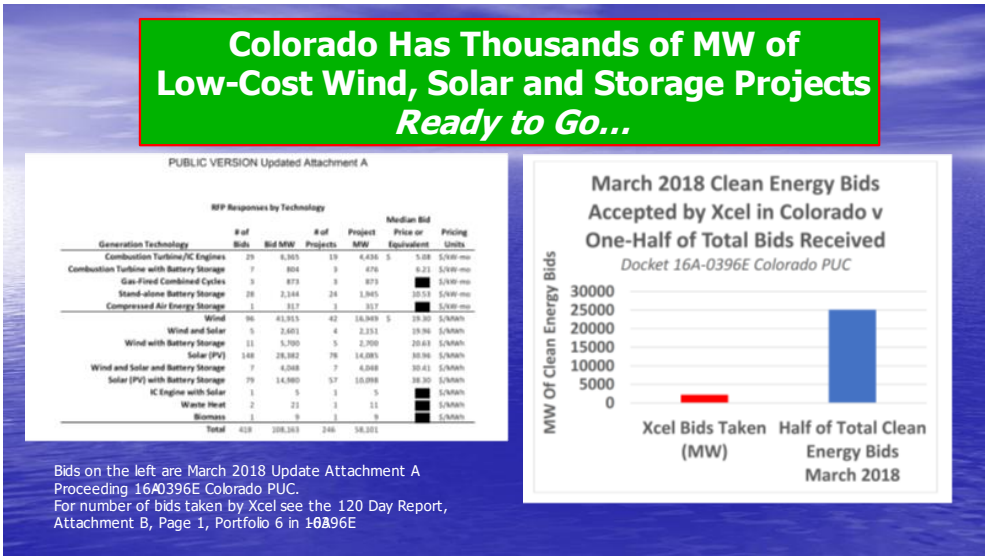
D. The Commission is Mandated by Colorado Law to Give the Fullest Possible Consideration to Clean Energy and Energy Efficient Technologies C.R.S. § 40-2-123 (1)(a))

For approximately two decades, the Commission has been mandated by Colorado law to give the fullest possible consideration to clean energy and energy efficient technologies by C.R.S. § 40-2-123 (1)(a)), as reproduced below.

> **C.R.S. 40-2-123 (1) (a)** The commission shall give the **fullest possible** consideration to the cost-effective implementation of new clean energy and energy-efficient technologies in its consideration of generation acquisitions for electric utilities, bearing in mind the beneficial contributions such technologies make to Colorado's energy security, economic prosperity, insulation from fuel price increases, and environmental protection, including risk mitigation in areas of high wildfire risk as designated by the state forest service. The commission shall consider utility investments in energy efficiency to be an acceptable use of ratepayer moneys. (Emphasis added.)

While Xcel and the Commission have given *some* consideration to clean energy and energy efficiency, we are still a **long** way from giving **"the fullest possible"** consideration to clean energy and energy efficiency. As discussed further below, Xcel has left thousands of MW of cost-effective clean energy options untapped over the last two decades. Given the climate chaos that is starting to envelope us and the statutory mandate in C.R.S. §40-2-123 (1)(a) it is **long past time** that the Commission and its Staff truly gave "the **fullest possible** consideration" to Colorado's abundant clean energy and energy efficiency options, as discussed further below.

Below is a slide comparing the approximately 50,000 MW of wind, solar and storage bids received in the 2016 PSCo Electric Resource Plan with the less than 2000 MW of bids that were accepted by Xcel. The graph on the right arbitrarily assumes that half of the 2016 bids were not good, which is unlikely!



E. The Commission is Mandated by Colorado Law to Consider the Social Cost of Methane in Resource Planning (C.R.S. §40-3.2-106)

The Commission is now clearly required to consider the Social Cost of Methane ("SCM") in Electric Resource Planning, as called for in C.R.S. §40-3.2-106 (1) as amended by SB21-246[5] and copied in full below.

> **C.R.S. 40-3.2-106. Costs of pollution in utility planning - rules.**
>
> **(1) The commission shall** require an electric or gas public utility subject to commission jurisdiction to **consider** the social cost of carbon dioxide emissions and the **social cost of methane emissions,** as set forth in subsections (4) and (5) of this section, when determining the cost, benefit, or net present value of any plan or proposal submitted in one of the following proceedings:
>
> **(a) Electric resource plans or any utility plan or application that considers or proposes the acquisition of new electric generating resources or the retirement of existing utility generation;**
> **(b)** Applications related to section 40-2-124;
> **(c)** Applications related to, or the commission's evaluation of, programs adopted under section 40-3.2-103;
> **(c.5)** Applications related to, or the commission's evaluation of, programs adopted under section 40-3.2-104; or
> **(d)** A plan or application for transportation electrification under section 40-5-107 or any other form of beneficial electrification, including beneficial electrification in buildings. (Emphasis added.)

While PSCo has included the Social Cost of Carbon ("SCC") in its modeling, it has not, to the best of Ms. Glustrom's knowledge, included the Social Cost of Methane ("SCM") in any of its modeling. This should be done in Phase II in accordance with C..R.S. §40-3.2-106 (1)

Examples of the Social Cost of Methane from the federal agency Interagency Working Group ("IWG") report from 2021 (in the record for this proceeding attached to the Direct Testimony of Colorado Renewable Energy Society witness Laurent Meillon, Hearing Exhibit 1502 LEM-2) are below. While one can argue over the best value to use for the Social Cost of

[5] The mandate to consider the Social Cost of Methane in Electric Resource Planning was added by Section 4 of SB21-246 which was signed on June 21, 2021 by Governor Polis.

Methane, it is clear that assuming the Social Cost of Methane is $0, as PSCo and the Commission are currently doing, is not the right answer. Importantly, in HB21-1238 (signed by the Governor on June 24, 2021) , the Colorado State Legislature established $1756/ton as the floor for the Social Cost of Methane to be used in gas efficiency programs.[6]

Table LWG-PHS-1

(From Hearing Exhibit 1502, LEM-2, Federal Interagency Workgroup on the Social Cost of Carbon, Methane and Nitrous Oxide--Feb 2021))

Table ES-2: Social Cost of CH_4, 2020 – 2050 (in 2020 dollars per metric ton of CH_4)

	Discount Rate and Statistic			
Emissions Year	5% Average	3% Average	2.5% Average	3% 95th Percentile
2020	670	1500	2000	3900
2025	800	1700	2200	4500
2030	940	2000	2500	5200
2035	1100	2200	2800	6000
2040	1300	2500	3100	6700
2045	1500	2800	3500	7500
2050	1700	3100	3800	8200

F. Commission Regulation 3601 Calls for Minimizing the Present Value of Revenue Requirements (PVRR)

Commission Regulation 3601 (copied below) (4 Code of Colorado Regulations "CCR" 723-3), states that a primary goal of electric utility resource planning is to ***minimize*** the net present value of revenue requirements. ("PVRR")

> **4 CCR 723-3, Rule 3601**
>
> The purpose of these rules is to establish a process to determine the need for additional electric resources by electric utilities subject to the Commission's jurisdiction and to develop cost-effective resource portfolios to meet such need reliably. It is the policy of the state of Colorado **that a primary goal of electric utility resource planning is to**

[6] For the Social Cost of Methane established by Colorado HB21-1238, see Section 7 of that bill establishing C.R.S. §40-3.2-107.

> ***minimize*** **the net present value of revenue requirements.** It is also the policy of the state of Colorado that the Commission gives the fullest possible consideration to the cost-effective implementation of new clean energy and energy-efficient technologies. (Emphasis added.)

The need to *minimize* the PVRR will become important as the Commission considers whether demand-side measures can help reduce the PVRR. There are strong reasons to believe that the PVRR can be minimized by stronger integrated planning and the inclusion of more efficiency and demand response/management practices.

The need to *minimize* PVRR is also important in the discount rate discussion. Generally Xcel offers a variety of portfolios, but never demonstrates where the ***minimum*** PVRR is—there is good reason to believe that adding more renewable resources and adding them earlier will lower the PVRR—especially when future fuel costs are not discounted so heavily. Xcel should be directed to prepare enough portfolios in Phase II that the Commission can clearly see a ***minimum*** PVRR—not just relatively lower PVRRs as PSCo has done in the past.

III. FACTUAL BACKGROUND ABOUT PSCO

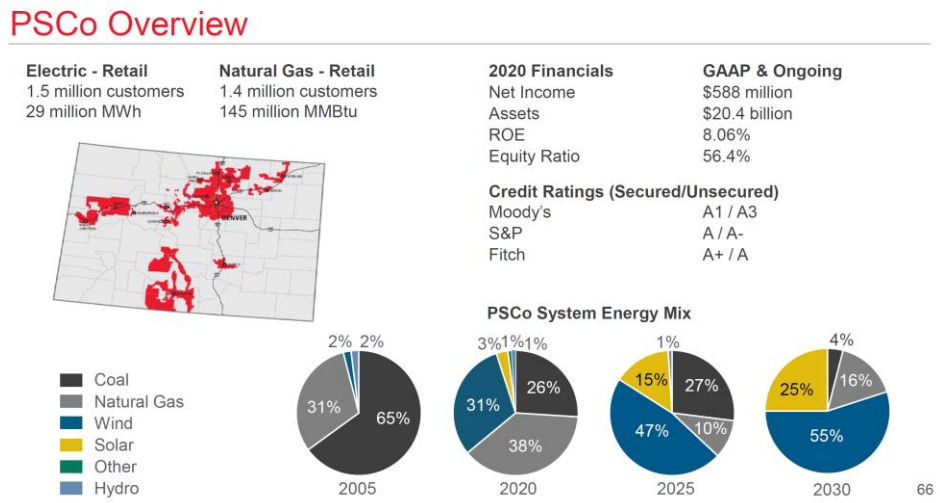
There are key facts about PSCo that the Commission should keep in mind as it deliberates on the best path forward in this proceeding.

A. Xcel in Colorado ("PSCo") Had $588 Million in After-Tax Net Income in Colorado in 2020

Xcel's Colorado subsidiary, Public Service Company of Colorado had $588 million in after-tax net income in 2020 as shown in Figure LWG-PHS-1 below, taken from Xcel's presentation to the Edison Electric Institute in November 2021, attached as LWG-1. This will become important as the Commission considers how much extra to pay in order to allow PSCo to own approximately 50% of replacement resources, as it likely hopes to do. With $588 million in

after-tax net income, it doesn't appear that the Commission needs to be overly concerned about PSCo's financial health. PSCo ownership should only be allowed when the costs are very comparable to non-PSCo owned resources. As discussed further below, PSCo's sales have been largely flat while their profits have soared—with a significant part of those profits coming from the now clearly-imprudent Pueblo Unit 3 coal plant (the one Xcel calls "Comanche 3.[7]") It is past time that this "abuse" be corrected.

Figure LWG-PHS-1
Summary Statistics for Public Service Company of Colorado
From Xcel's Presentation to the Evercore ISI Conference January 2022
Attachment LWG-1, Slide 66[8]



[7] It seems unlikely that Native American tribes would want a coal plant named after them and it is unlikely that Xcel has gained permission to do so, so it is seems more appropriate to refer to the Pueblo Unit 3 coal plant by the City in which it is located.

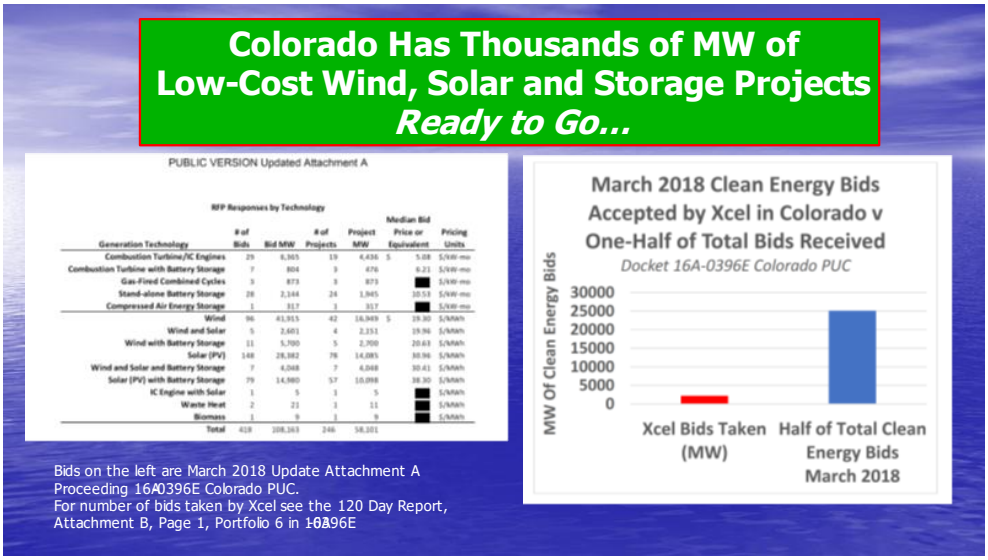
[8] Xcel's Presentations to Investors available from https://investors.xcelenergy.com/stock-information/shareholder-information/default.aspx The record includes a very similar PPT given by Xcel to the Edison Electric Institute included as LEM-12, Hearing Exhibit 1502.

PSCo's $588 million in after-tax net income can be seen in Figure LWG-PHS-1 above and confirmed on page 24 of PSCo's 2020 10-K, attached as LWG-2.

B. Xcel in Colorado Was Still Over 60% Fossil Fuel Generation in 2020 for Electricity

As seen in Figure LWG-PHS-1 above, in 2020, Xcel was over 60% fossil fuel generation—about 26% coal and about 38% natural gas. While Xcel is making progress on clean energy, it has been "slow-walking" the transition—leaving thousands of MW of cost-effective wind and solar undeveloped.[9] This is both unconscionable—and illegal under CRS §40-2-123 (1) calling on the Commission to give the fullest possible consideration to clean energy and energy efficient technologies. It is long past time that this abuse was corrected.

Figure LWG-PHS-2
PSCo Left Over 90% of the Clean Energy Bids "On the Table" in 2016
Data from the 120 Day Report in 16A-0396E



[9] In PSCo's 2016 Electric Resource Plan, Xcel received over 50,000 MW of wind, solar and storage bids as noted in the 120 Day Report for that proceeding and took less than 2000 MW of those bids—leaving over 90% of the renewable bids and storage "on the table." This is depicted in the PPT slide in Figure LWG-PHS-2.

C. Xcel's Colorado Sales Have Been Largely Flat While Their Profits Have Increased Over 170% Since 2005

While Commissioners and Staff and many parties' attorneys come and go, PSCo keeps coming back for rate increase after rate increase, and, as shown in Table LWG-PHS-2 below, while PSCo's sales have been largely flat, their profits have soared—but almost no one (except Xcel and Ms. Glustrom) is around with institutional memory to keep track of all of this!!

Table LWG-PHS-2
Xcel's Colorado Sales Largely Flat—Profits Soaring
Data from PSCo's Annual 10-K Reports available from
https://investors.xcelenergy.com/stock-information/shareholder-information/default.aspx
2020 PSCo 10-K attached as LWG-2; 2006 PSCo 10-K attached as LWG-3

Year	Sales	Before Tax Profits	After Tax Profits
2005	34, 593 GWh	$282 Million	$211 Million
2019	37,337 GWh	$658 Million	$578 Million
2020	33,301 GWh	$633 Million	$588 Million

As seen in Table LWG-PHS-2,

between 2005 and 2019,[10] PSCo's sales have increased about

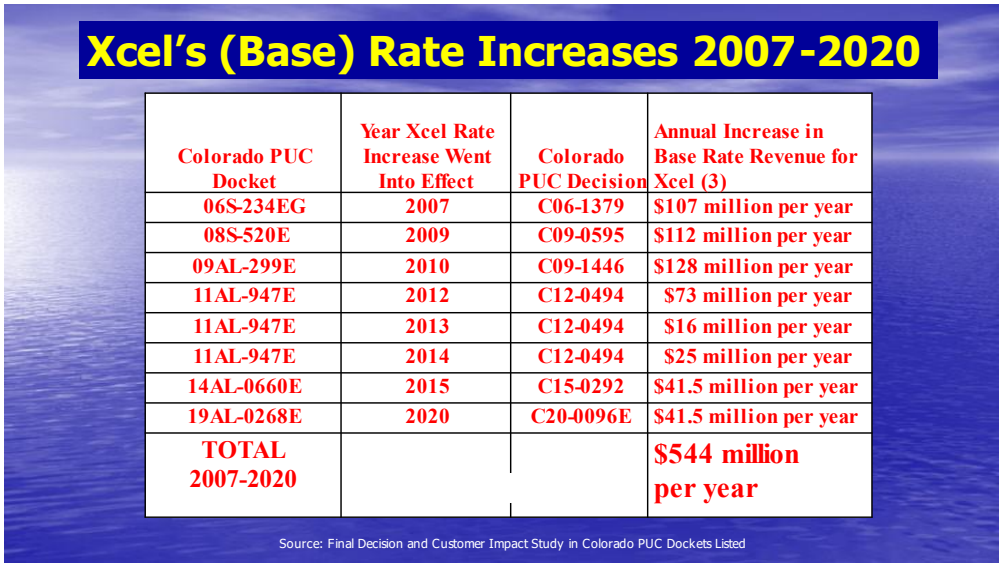
7.9%[11] while PSCo's profits have increased 174%!!![12]

[10] Given the effects of the Covid-19 pandemic on electric sales, the comparison was done using 2019 data. Note that sales from 2005 to 2020 actually declined….
[11] Sales up 7.9% (37,337-34593)/34,593) x 100)) = 7.9%
[12] After-Tax Profits Up 174% (($578 M-$211M)/$211M) x 100)) = 174%

In this ERP and related proceedings like the transmission proceeding (21A-0096E) and the PSCo rate case (21AL-0317E) this Commission will need to decide how much to prioritize PSCo's financial health. A review of the data in Table LWG-PHS-2 will indicate that PSCo is doing just fine—though of course they always want more revenue so they can pass it on to their employees and investors and drive Earnings Per Share up 5-7% a year (despite flat sales) as detailed in in Figure LWG-PHS-3 below and Xcel's PPT to Evercore ISI included as LWG-1.

Figure LWG-PHS-3 is a summary of PSCo's rate increases since 2006.

Figure LWG-PHS-3
Summary of Xcel's Rate Increases in Colorado
Data from Dockets and Decisions listed in the table.



Xcel's (Base) Rate Increases 2007-2020

Colorado PUC Docket	Year Xcel Rate Increase Went Into Effect	Colorado PUC Decision	Annual Increase in Base Rate Revenue for Xcel (3)
06S-234EG	2007	C06-1379	$107 million per year
08S-520E	2009	C09-0595	$112 million per year
09AL-299E	2010	C09-1446	$128 million per year
11AL-947E	2012	C12-0494	$73 million per year
11AL-947E	2013	C12-0494	$16 million per year
11AL-947E	2014	C12-0494	$25 million per year
14AL-0660E	2015	C15-0292	$41.5 million per year
19AL-0268E	2020	C20-0096E	$41.5 million per year
TOTAL 2007-2020			$544 million per year

Source: Final Decision and Customer Impact Study in Colorado PUC Dockets Listed

D. PSCo is Planning on Spending Over $9.9 Billion in Colorado in the Next Five Years to Keep Driving Up Their Earnings Per Share

While Xcel is making progress on decarbonization in Colorado, their rhetoric is stronger than their actions, and they use their rhetoric about reducing greenhouse gas emissions to cover up their desire to **spend A LOT of money** so that they can keep driving up rates and keep their

Earnings Per Share going up 5-7% (see slide 2 in the Xcel PPT to Edison Electric, Attachment LWG-1). In particular…

Xcel is planning to spend over $9.9 billion in Colorado over the next five years—the equivalent of <u>building 9-10 new coal plants</u>—most of it NOT on renewable generation or batteries.

Monopolies "like" to spend money because if it is capital, they can put it in their "rate base" and drive their customers' rates[13] up.

<u>Figure LWG-PHS-4</u>
<u>Xcel's Plans to Spend Over $9.9 Billion in Colorado Over the Next 5 Years Alone</u>
Slide from LWG-1, Xcel PPT to Evercore ISI, January 2022, Slide 69

PSCo Base Capital Expenditures by Function

$ Millions

	2022	2023	2024	2025	2026	Total
Electric Distribution	$595	$600	$555	$680	$730	$3,160
Electric Transmission	$400	$515	$780	$895	$445	$3,035
Electric Generation	$230	$115	$95	$80	$65	$585
Natural Gas	$450	$465	$490	$455	$490	$2,350
Other	$250	$150	$145	$105	$120	$770
Renewables	$5	$5	$5	$5	$10	$30
Total	**$1,930**	**$1,850**	**$2,070**	**$2,220**	**$1,860**	**$9,930**

Excludes potential incremental investment associated with the Colorado resource plan, PPA buyouts and future wind repowerings

69

As the Commission decides how much generation PSCo should be able of owning and the impact on rates as we move forward on the clean energy transition, it is important to remember that Xcel is highly motivated to make capital expenditures (to the tune of $9.9 billion

[13] In recent years, Xcel has liked to brag about bills remaining stable, but that is largely due to the relatively low costs of natural gas over the last decade which mask the fact that PSCo keeps driving Colorado rates up.

in the next five years alone) so that it can drive up their Earnings Per Share ("EPS") despite basically flat sales and the declining cost to generate clean electricity.

If the PUC is not cautious, Xcel will continue to spend and spend and spend and drive up rates and undermine the public's faith in the lower cost of renewable generation—potentially setting back progress on Colorado's climate goals and the clean energy transition.

IV. PUEBLO UNIT 3 SHOULD NEVER HAVE BEEN BUILT; IT SHOULD BE PHASED OUT IN THE NEXT COUPLE OF YEARS

A. It is Unconscionable to Burn Coal At This Point

It seems it should be completely obvious that burning coal at this point is unconscionable given what climate chaos will mean for us and for many succeeding generations. It should have been obvious twenty years ago, but now it is **painfully—very, very painfully—obvious.**

The seriousness of the climate crisis has been very well briefed for the Commission by Colorado Renewable Energy Society witness Dr. Scott Denning in his Answer Testimony and Attachments (Hearing Exhibit 1501 and attachments.) An excerpt from Dr. Dennings testimony is below.

Excerpts--Answer Testimony Dr. Scott Denning, Hearing Exhibit 1501.

Pages 4-6,7,9 (Starts on next page .)

Q: PLEASE EXPLAIN WHAT YOU MEAN WHEN YOU SAY THAT GLOBAL WARMING AS A RESULT OF BURNING COAL, OIL, AND GAS IS UNEQUIVOCAL.

A: The role of burning coal, oil, and gas in producing CO2, the role of that CO2 in trapping Earth's heat to warm the climate, and the impacts of that global warming on ecosystems and

people are unequivocal. They are based on a fundamental understanding of physics developed over the past 200 years and supported by many separate and independent lines of evidence. These are among the several key findings of climate science which are unequivocal, meaning that they are fundamental to our understanding and not in question (ASD-2). Some of these "unequivocal pillars" are:

1) Like everything else in the universe, the Earth warms when it absorbs more heat (from the Sun) than it emits back to space (as infrared radiation).
2) CO2 in the air absorbs outgoing infrared radiation, so adding CO2 to the air warms the Earth until it can once more emit as much heat as it absorbs from the Sun.
3) Burning carbon in air creates CO2, which further reduces the emission of heat by the Earth until it warms up enough to balance the incoming heat from the Sun
4) About half the CO2 from burning coal, oil, and gas is removed from the air by oceans, plants, and soils but the remaining half remains in the air for many centuries after the fuel is burned.
5) As long as we continue to burn carbon, CO2 will continue to rise, reducing the rate at which the Earth can emit heat into space. This will keep warming the Earth until we stop burning carbon for fuel.
6) Before the industrial revolution, the amount of CO2 in the air was very steady for many thousands of years. Since 1750, CO2 has risen about 50% and global temperatures have risen an average of about 2 degrees Fahrenheit.
7) Virtually all the increase of CO2 and temperature in modern times is caused by burning coal, oil, and gas (about 80%) and deforestation (about 20%). Natural changes during that time have reduced, not added to the warming.

8) Warming caused by burning carbon has led to rapid and widespread changes in the atmosphere, oceans, ice sheets, and landscapes across the world which are unprecedented, in many centuries to many thousands of years.

There are many important and fascinating areas of ongoing research in climate science, but the conclusions enumerated above are unequivocal.

In the semiarid western United States, the most severe impacts of warming caused by burning coal, oil, and gas are the result of warming and drying. In Colorado, average temperatures over the past 30 years are a little less than 2˚ Fahrenheit warmer than they were in the first half of the 20th Century. The coldest winter temperatures have warmed by more than 4˚ Fahrenheit in our region. Colorado is heavily dependent on spring snowmelt for agricultural and municipal water supply. Statewide snowpack (peak snow water equivalent) is down about 20% over the past 50 years (ASD-3), and many long-term snow monitoring sites across the southern Rocky Mountains show reductions of 50% over the past 40 years (ASD-5). Warming and drying resulting from increased CO2 has led to increasingly severe fire weather (hot, dry, and windy), and the average area burned by wildfires in the western United States has more than tripled in the past 50 years (ASD-6).

In the semiarid west, water demand increases exponentially with temperature. As the climate warms our cities, crops, livestock, and forests use more and more water. At the same time, the seasonal storage of huge amounts of water in our spring snowpack is dramatically reduced by warming and the increase in wildfires severely impacts air and water quality. We have already experienced these impacts and they will worsen with each additional degree of warming.

A: Global warming will continue to get worse and worse until CO2 stops increasing. Since every bit of coal, oil, and gas adds CO2 to the atmosphere for many centuries, we must stop burning carbon to stop the impacts from getting worse. The sooner we replace carbon combustion with clean energy, the easier and less expensive the impacts will be to manage.

Q: PLEASE SUMMARIZE YOUR TESTIMONY.

A: Every bit of carbon burned adds CO2 to the atmosphere for many centuries, warming the climate. Warming will increase until we stop burning carbon. The consequences for extreme heat, drought, water shortages, forest fires, human health, and agriculture will get worse and worse until we stop making them worse. Without strong policies to stop burning coal, oil, and gas the economic damages from climate change will be much worse than the cost of avoiding those damages. It is imperative that we stop burning carbon as soon as we can.

Climate Scientist Dr. Denning's testimony (Hearing Exhibit 1501) is clear.

Warming will increase until we stop burning carbon.

It is imperative that we stop burning carbon as soon as we can.

The attachments to Dr. Denning's Answer Testimony provide more than enough science to make it clear that it is unconscionable to keep burning coal—and of the need to move beyond fossil methane gas as quickly as possible. Below are some excerpts from Dr. Denning's ASD-3 attachment.

Excerpts from Dr. Denning's ASD-3 Attachment, Hearing Exhibit 1501

Recommended Citation for the Full Report

USGCRP, 2017: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 470 pp.

Heatwaves have become more frequent in the United States since the 1960s, while extreme cold temperatures and cold waves are less frequent. Recent record-setting hot years are projected to become common in the near future for the United States, as annual average temperatures continue to rise. Annual average temperature over the contiguous United States has increased by 1.8°F (1.0°C) for the period 1901–2016; **over the next few decades (2021–2050), annual average temperatures are expected to rise by about 2.5°F for the United States, relative to the recent past (average from 1976–2005), under all plausible future climate scenarios**.

The incidence of large forest fires in the western United States and Alaska has increased since the early 1980s and is projected to further increase in those regions as the climate changes, with profound changes to regional ecosystems.

Annual trends toward earlier spring melt and reduced snowpack are already affecting water resources in the western United States and these trends are expected to continue. Under higher scenarios, and assuming no change to current water resources management, **chronic, long-duration hydrological drought is increasingly possible before the end of this century**.

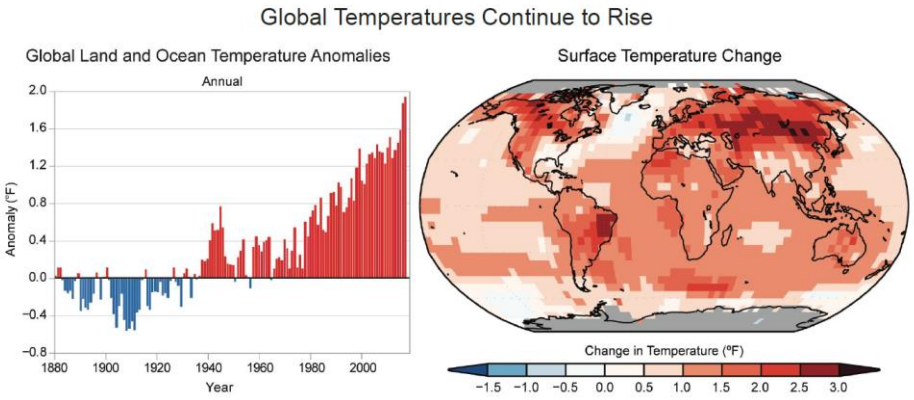


Figure ES.1: (left) Global annual average temperature has increased by more than 1.2°F (0.7°C) for the period 1986–2016 relative to 1901–1960. Red bars show temperatures that were above the 1901–1960 average, and blue bars indicate temperatures below the average. (right) Surface temperature change (in °F) for the period 1986–2016 relative to 1901–1960. Gray indicates missing data. *From Figures 1.2. and 1.3 in Chapter 1.*

There is a Significant Possibility for Unanticipated Changes

Humanity's effect on the Earth system, through the large-scale combustion of fossil fuels and widespread deforestation and the resulting release of carbon dioxide (CO_2) into the atmosphere, as well as through emissions of other greenhouse gases and radiatively active substances from human activities, is unprecedented. There is significant potential for humanity's effect on the planet to result in unanticipated surprises and a broad consensus that the further and faster the Earth system is pushed towards warming, the greater the risk of such surprises.

There are at least two types of potential surprises: *compound events*, where multiple extreme climate events occur simultaneously or sequentially (creating greater overall impact), and *critical threshold* or *tipping point events*, where some threshold is crossed in the climate system (that leads to large impacts). The probability of such surprises—some of which may be abrupt and/or irreversible—as well as other more predictable but difficult-to-manage impacts, increases as the influence of human activities on the climate system increases. (Ch. 15)

Unanticipated and difficult or impossible-to-manage changes in the climate system are possible throughout the next century as critical thresholds are crossed and/or multiple climate-related extreme events occur simultaneously. (Ch. 15)

- Positive feedbacks (self-reinforcing cycles) within the climate system have the potential to accelerate human-induced climate change and even shift the Earth's climate system, in part or in whole, into new states that are very different from those experienced in the recent past (for example, ones with greatly diminished ice sheets or different large-scale patterns of atmosphere or ocean circulation). Some feedbacks and potential state shifts can be modeled and quantified; others can be modeled or identified but not quantified; and some are probably still unknown. (*Very high confidence* in the potential for state shifts and in the incompleteness of knowledge about feedbacks and potential state shifts). (Ch. 15)

- The physical and socioeconomic impacts of compound extreme events (such as simultaneous heat and drought, wildfires associated with hot and dry conditions, or flooding associated with high precipitation on top of snow or waterlogged ground) can be greater than the sum of the parts (*very high confidence*). Few analyses consider the spatial or temporal correlation between extreme events. (Ch. 15)

- While climate models incorporate important climate processes that can be well quantified, they do not include all of the processes that can contribute to feedbacks (Ch. 2), compound extreme events, and abrupt and/or irreversible changes. For this reason, future changes outside the range projected by climate models cannot be ruled out (*very high confidence*). Moreover, the systematic tendency of climate models to underestimate temperature change during warm paleoclimates suggests that climate models are more likely to underestimate than to overestimate the amount of long-term future change (*medium confidence*). (Ch. 15)

The record in this proceeding is clear—
we need to move beyond burning fossil fuels, starting with coal,
AS SOON AS POSSIBLE—
FULL STOP!!

If the Commissioners or anyone else want to read more of the science—just check out Dr. Denning's testimony and the attachments he has submitted. They are unrefuted by Xcel or any other party. **The science is clear. The record is clear. You are on solid ground**—and it is beyond clear that you are morally obligated to align decisions in this Electric Resource Plan with the abundant science about the climate crisis that is descending over our entire planet—**with much, much worse consequences to come in the lifetimes of our children and grandchildren and on down for decades and likely centuries!!!!** As parents and thoughtful human beings, Ms. Glustrom begs of you to recognize how serious indeed the climate crisis is and act accordingly.

B. It is BEYOND Unconscionable to Profit from Burning Coal At This Point

Xcel and the signers of the Settlement Agreement in this proceeding are suggesting that not only is it OK to keep burning coal for another 13 years, it is also OK for Xcel to continue to earn 100% of its profits on the Pueblo Unit 3 coal plant. How can that be???? IT IS WAY BEYOND UNCONSCIONABLE TO BE PROFITING FROM THE BURNING OF COAL AT THIS STAGE—**YES—ALL CAPS, RED INK, LARGE FONT AND UNDERLINED**

BEYOND UNCONSCIONABLE!!

Given what we know about and are experiencing with the impacts of the climate crisis, how could anyone with a conscience ask to earn profits from burning coal—like being asked to earn profits for pouring kerosene on your neighbor's burning house—
almost literally!!

Let's try a few pictures for those that need to have pictures to get a point….[14]

Marshall Fire, Boulder County, Colorado December 30, 2021[15]

Over 1000 Homes Incinerated

[14] If you prefer science instead of pictures, then scroll back up for the science as presented by Dr. Denning and refer to Hearing Exhibit 1501 and the attachments in this 21A-0141E proceeding.

[15] In case you somehow missed the stories on the Marshall Fire in Boulder County on December 30, 2021, see https://denvergazette.com/news/fires/at-least-three-grass-fires-burning-in-boulder-county-amid-80-mph-gusts/article_9010bd3c-69a9-11ec-bf43-7f7e671d637e.html or https://www.denverpost.com/2021/12/31/marshall-fire-boulder-county-friday/ or https://www.cpr.org/2022/01/11/colorado-climate-change-warmer-temperatures or https://www.axios.com/climate-change-links-boulder-fires-edb51642-cbd5-496a-b544-2aa2ca2d6e2b.html or for a particularly wrenching video of the destruction see the video at https://www.gofundme.com/f/help-jon-kofler-rebuild or dozens of other stories….

Fire takes over a business in Louisville, Colorado. on Dec. 30. Photo: Helen H. Richardson/MediaNews Group/The Denver Post via Getty Images

Yes—burning coal is like pouring kerosene on your neighbor's burning house or business (see Dr. Denning's testimony for the science…)—and Xcel wants to profit from doing that. REALLY?????

Of course it isn't just the Marshall Fire—it has been a year of weather extremes, including crippling droughts, terrible air quality, landslides and extreme snow falls…,[16] just like the scientists told us was likely to happen—See Hearing Exhibit 1501 and attachments for the details…

Perhaps most appallingly, the utility industry knew many decades ago[17] that climate change was real and serious and driven largely by burning fossil fuels—and yet Xcel spent a billion dollars building the Pueblo Unit 3 coal

[16] See for example https://www.denverpost.com/2021/12/30/colorado-weather-top-events-2021/

[17] See https://www.energyandpolicy.org/utilities-knew-about-climate-change/

plant as well as making large expenditures on the Brush and Hayden coal plants as well as large investments in fossil methane generation and the supporting infrastructure.

Importantly and ever so sadly, as TERRIBLE as 2021 was—2021 is NOTHING compared to what our children and grandchildren will be experiencing, with the 2030's likely much worse than the 2020's and the 2040's worse than the 2030's and on out….In the end,

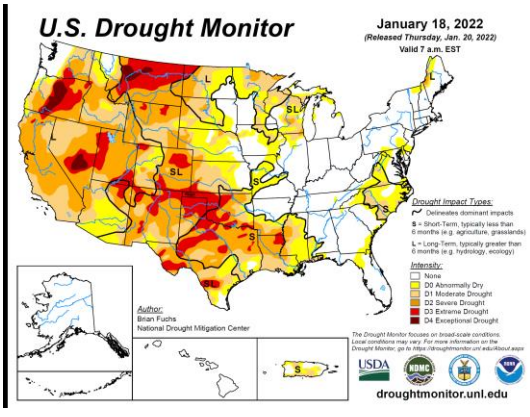
2021 will likely be one of the coolest—and calmest—years in the 21st century….

AND XCEL WANTS TO PROFIT FROM BURNING COAL AND CONTINUING TO ACCELERATE THE CLIMATE CHAOS THAT IS BEGINNING TO DESCEND ON US???

REALLY??

Below are a few images representing the impacts that the climate crisis is having throughout our country and all over the planet….

- Historic droughts in the western US[18]



[18]See https://www.cnn.com/2021/06/19/politics/what-matters-climate-change-western-drought/index.html map from https://droughtmonitor.unl.edu/

- Monster hurricanes[19]

- Deadly Tornadoes in Winter[20]

[19] See https://www.cnbc.com/2021/09/08/hurricane-idas-damage-tally-could-top-95-billion-making-it-7th-costliest-hurricane-since-2000-.html

[20] December 2021 tornadoes in Kentucky https://abcnews.go.com/US/50-dead-tornadoes-devastate-kentucky/
January 2022 tornadoes in Florida https://edition.cnn.com/2022/01/16/us/florida-tornadoes-damages/index.html

- Super Typhoons in the Pacific[21]

- Drought in Kenya and East Africa[22]

[21] https://archive.dhakatribune.com/world/asia/2020/11/12/major-floods-in-manila-as-typhoon-batters-philippines

[22] https://www.mnnonline.org/news/severe-drought-grips-kenya/ and https://www.pbs.org/newshour/show/kenyas-worst-drought-in-decades-creates-humanitarian-crisis

And the list goes on and on—hurricanes, polar vortices, blizzards, floods, monstrous fires and on and on[23]—all intensified by the warming planet which is driven by emissions of carbon dioxide, methane and other greenhouse gases. For the unequivocal science on climate, see Hearing Exhibit 1501 and attachments in this 21A-0141E proceeding.

How can Xcel—or anyone with a moral conscience see these gut wrenching images day after day and still want to earn a profit from burning coal????

And why should Xcel's customers have any trust whatsoever in Xcel's commitment to being a trusted provider of clean electricity[24] when what they are really doing is protecting their profits instead of protecting their customers and the livability of the only planet we know of that supports life!!!

C. Pueblo Unit 3 Emits About 3-5 Million Tons of Carbon Dioxide Per Year When It is Operational—The Equivalent of Well Over 500,000 Passenger Vehicles

The Pueblo Unit 3 coal plant, when it is fully operational emits 3-5 million tons of carbon dioxide as clearly quantified in Discovery response CRES7-11 included in the record as LEM-8,

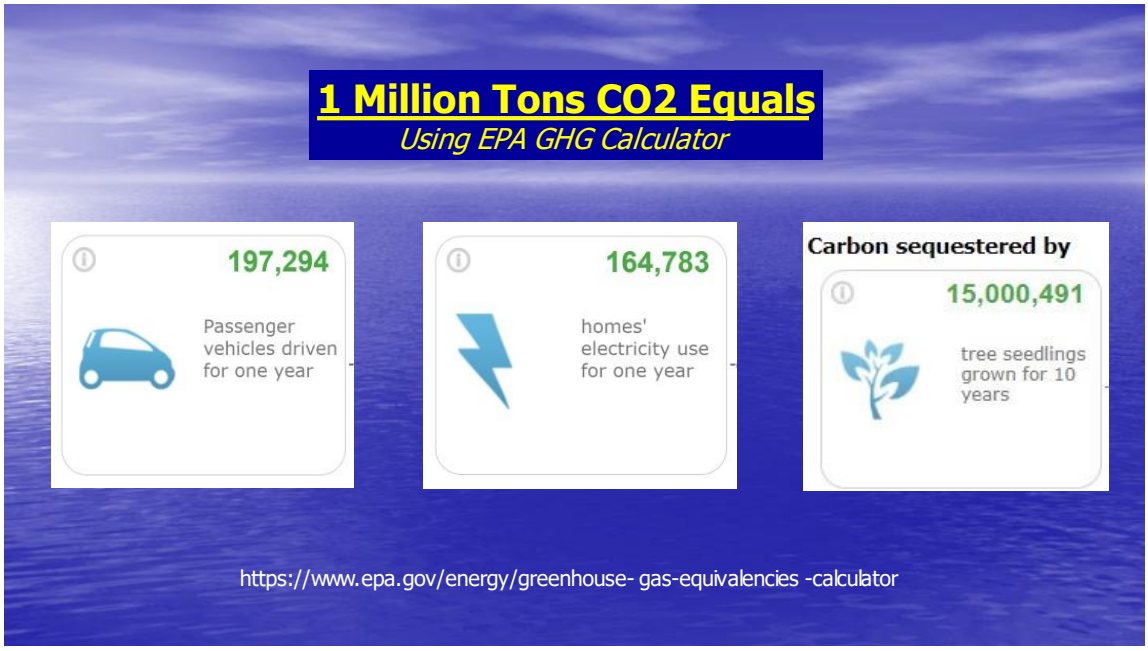
[23] For 2021 US weather disasters see https://edition.cnn.com/2022/01/10/weather/2021-us-billion-dollar-disasters-climate-noaa/index.html See also Hearing Exhibit 1500, Attachment CFK-2 for billion dollar weather disasters 1980-2020

[24] For Xcel's mission to be a trusted provider of clean energy see https://co.my.xcelenergy.com/s/about

attached to the Answer Testimony of Colorado Renewable Energy Society ("CRES") witness Laurent Meillon (Hearing Exhibit 1502).

The magnitude of greenhouse gas emissions can be calculated using the Environmental Protection Agency ("EPA") greenhouse gas equivalencies calculator as shown below in Figure LWG-PHS-5. Emissions of 3 million tons per year will equate to more than 500,000 passenger vehicles. Nothing else we do (other than close other coal plants…) is likely to have such a big impact on Colorado's greenhouse gas emissions as phasing Pueblo Unit 3 out quickly.

Figure LWG-PHS-5
Equivalences for 1 Million Tons of Carbon Dioxide ("CO2")
Available from https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator



It is clear that even if the Pueblo Unit 3 were operating at a low capacity factor of say 20%, it will still likely emit about 1 million tons of carbon dioxide—the equivalent of close to 200,000 passenger vehicles. Any capacity factor above that will lead to even greater emissions of carbon dioxide—emissions that are almost certainly not necessary. Given the profound

seriousness of the climate chaos that is coming, it is important to phase Pueblo Unit 3 in the next few years.

D. Xcel Can Afford to Pay the Property Taxes and Job Transition Costs for Pueblo

Much has been made of the need to help the community of Pueblo with the property tax deficit that may appear with the closure of Pueblo Unit 3 and the workers with their job transitions. Ms. Glustrom is a strong supporter of helping fossil fuel dependent communities through this transition (despite the fact that millions of Americans, including Ms. Glustrom's family, have had to go through very significant job disruption with no help whatsoever…) but at this point, the property tax payments and job transition assistance are small potatoes (all told likely less than $30 million a year) and Xcel—with $588 million a year in after-tax net income can afford to pay those costs. Even if these costs are $50 million per year—PSCo could absorb those and likely still have over $500 million in after-tax net income…

In comparison Boulder County has 1000 households that are homeless and over $500 million dollars of damage to contend with (to say nothing of the horrific psychological price that the families and their communities are paying)—and these climate-fueled disasters will just keep getting worse. Ms. Glustrom is sympathetic to the needs of the coal workers and their communities—but they pale in comparison to the needs of the thousands of people who are already suffering and who will suffer from the climate chaos that is descending on all of us—all over the planet….

E. It is Now Clear That the Pueblo Unit 3 Coal Plant Was Both Imprudent to Build and Has Been Operated Imprudently; It Was Never Truly Needed—Except to Drive Up Xcel's Profits—Which It Has Done Very Well

It is now clear to essentially everyone that is paying attention that PSCo's plan to build a coal plant and operate it until 2070 was a serious mistake. It is also clear that the coal plant has been operated imprudently as well established in this proceeding and in Proceeding 20I-0437E.[25]

What many people, including the current PUC Commissioners and many of the current participants at the Colorado PUC, don't know is the history of the building of Pueblo Unit 3 and how it was never really needed since it largely represented excess capacity on top of the approximately 1000 MW reserve margin. Xcel wasn't motivated to build it because Colorado needed new coal generation; rather Xcel was motivated to build it because they crashed their stock price in 2002 and needed to make a large investment to recover their stock price.

Unfortunately, Colorado "won" the lottery for Xcel building a big new coal plant during the window of opportunity offered by then President George W. Bush who made it clear that his administration wouldn't hold new coal plants up over concerns about air pollution.[26]

Figure LWG-PHS-6 below shows Xcel's stock price and the 2002 crash. The rest is documented in many places in the record at the Colorado PUC with a summary in the report, Colorado's Billion Dollar Mistake: The Pueblo Unit 3 Coal Plant, attached as LWG-4. The Billion Dollar Mistake Report is heavily footnoted and points to the places in the PUC records

[25] The PUC Staff Report on the operational problems at Pueblo Unit 3 is included in the record of this proceeding as LEM-10, attached to Hearing Exhibit 1502. The problems are also discussed in the Answer Testimony of PUC Staff witness Steve Dahlke. (Hearing Exhibit ZZ)

[26] The Bush initiative was called the "Clear Skies" Initiative, but like a lot of initiatives during the Presidency of George W. Bush presidency the actual purpose was the opposite of the name. Clean Air Act experts understood that the impact of the "Clear Skies" initiative would be to greatly weaken the Clean Air Act. More information at https://en.wikipedia.org/wiki/Clear_Skies_Act_of_2003

where the data referenced can be found. Current PUC Staff are encouraged to keep a copy of this report so that they will have a "guide" to much of the record on Pueblo Unit 3 as Colorado works its way out from underneath the Billion Dollar Mistake.

Figure LWG-PHS-6 shows the tremendous crash in Xcel's stock price in the middle of 2002. (Compare the 2002 crash to the much smaller "crash" at the end of 2008 in the middle of the financial crisis.)

Figure LWG-PHS-6

Taken from Attachment LWG-4, Colorado's Billion Dollar Mistake: Pueblo Unit 3

Stock Price for Xcel Energy 1999-2009

Source: http://phx.corporate-ir.net/phoenix.zhtml?c=89458&p=irol-stockChart

Year

The coal plant plus all of the other large capital expenditures that Xcel and its Colorado operating company, PSCo, have made over the last 5 years have indeed rescued Xcel's stock price (Xcel's stock price on Jan 20, 2022 was over $68/share[27]—or way off the chart shown in Figure LWG-PHS-6, above).

[27] Xcel's stock price can be tracked in many places, including on Xcel Energy's webpage under Information for Investors--https://investors.xcelenergy.com/stock-information/historical-prices/default.aspx

Also, as shown in Table LWG-PHS-2, above, after the many rate increases granted by the Colorado PUC since Xcel began building Pueblo Unit 3 and putting it into rate base, PSCo's after-tax net income has increased over 170%--from $211 million in 2005 to $588 million in 2020—despite PSCo's sales being close to flat and the price of their primary product, electricity, falling dramatically with the declining cost of wind and solar generation. A summary of PSCo rate increases is provided above in Figure LWG-PHS-3.

F. PSCo Witnesses Make a Big Show of Protecting the Pueblo Community, but Really of Course They are Protecting Their Profits by Keeping Pueblo Unit 3 in their Rate Base.

While PSCo made it sound like they wanted to give the Pueblo community time for the transition, of course what they were really doing was **protecting their profits** by keeping Pueblo Unit 3 in their rate base as long as they possibly can.

Rough estimates of the "return on" the Pueblo Unit 3 start with the approximately $1 billion dollar price tag and a Weighted Average Cost of Capital of approximately 7% indicates that when the plant was first brought on-line, the "return on" payments to PSCo were in the neighborhood of $70 million. Add to that Depreciation ($17 million per year) , fuel costs ($50 million/year) and Operations and Maintenance (O&M) (estimated at the time as $16 million per year…) and it is clear that what began as the Billion Dollar Mistake has now become the Two Billion Dollar Mistake after more than a decade of over $100 million per year in costs. The annusl costs for Pueblo Unit 3 are documented in the Billion Dollar Mistake (Attachment LWG-4), on page 33 and were also included in Ms. Glustrom's testimony in the 08S-520E proceeding.

As the Pueblo Unit 3 coal plant has depreciated over the last decade the amount of "return on" that PSCo has earned has been dropping, but there is still reason to believe that

PSCO has received well over $500 million in "return on" the Pueblo Unit 3—including tens of millions of dollars a year for its shareholders.

The updated costs for Pueblo Unit 3 are found in PSCo's current rate increase proceeding (21AL-0317E) in DAB-33, attached to PSCo witness Deborah Blair's settlement testimony, Hearing Exhibit 143 in Proceeding 21AL-0317E. DAB-33 is included as Attachment LWG-5 and the key amounts being taken annually from Xcel's customers to pay for the billion dollar mistake that is Pueblo Unit 3 (the one Xcel calls "Comanche 3"), are summarized below (minus fuel costs which are likely well over $50 million per year.)

Table LWG-PHS-3
Current Non-Fuel Revenue Requirement for Pueblo Unit 3—
Key Elements and Total
Data from DAB-33 with Hearing Exhibit 143 in 21AL-0317E—Attached as LWG-5

Pueblo Unit 3 2021 Revenue Requirement *21A-0317E Settlement Agreement*	**Amount**
"Required" Earnings @ 6.82% Return	$41.6 Million
Operations and Maintenance	$37.7 Million
Depreciation	$16 Million
Total Revenue Requirement	**$107 Million**

It makes no sense whatsoever for PSCo ratepayers to pay $107 million a year (not including fuel costs)—including over $40 million per year in "return on"—the imprudently conceived and imprudently operated Pueblo Unit 3 coal plant. This is an "abuse" of PSCo's ratepayers that has been going on way too long and which the Commission is directed to correct by C.R.S. §40-3-102.

While the proposed Settlement Agreement in this proceeding suggests reduced dispatch and operations of the Pueblo Unit 3 coal plant, if accepted it would ensure that PSCo continues to earn its full level of profit (i.e. "return on") for this imprudent coal plant until 2034—with the "return on" currently over $40 million per year as shown in Table LWG-PHS-7 above.

Let's be clear. PSCo is NOT protecting
the community of Pueblo or its workers;
rather PSCo is using the Pueblo community (once again…)
to protect PSCo's profits from burning coal—
As discussed previously, this is

BEYOND UNCONSCIONABLE!!

Extracting over $100 million from ratepayers to pay for Pueblo Unit 3 is an "abuse" of ratepayers and is mandated to be corrected by C.R.S. § 40-3-102.

G. In Addition to Carbon Dioxide, the Pueblo Unit 3 Coal Plant is a Large Source of Other Pollution, Including Mercury, and a Very Large User of Water

While tremendous attention has rightly been given to the carbon dioxide emitted by the Pueblo Unit 3 coal plant, it is important to remember that even if, as one commentator said, there were "marshmallows" coming out of the coal plant instead of CO2 (a lot of marshmallows that would be at 3-5 million tons per year…), there are dozens of other reasons to stop burning coal there. As shown in Figures LWG-PHS-8 and LWG-PHS-9 below and as discussed in Hearing Exhibit 1502, the Pueblo Unit 3 is both a very large water user and a very large emitter of hazardous air pollutants—including mercury, lead, arsenic, benzene and acid gases (you know the ones that make it hard to breathe and likely lead to the persistent cough you hear in many residents of Pueblo…).

Figure LWG-PHS-7

From page 35 of Attachment LWG-5, See also Hearing Exhibit 1502.

Figure 4
Water Use by the Pueblo Coal Plants
Compared to the Top 10 Water Users in the State
(Information from the Annual Report of the Pueblo Board of Water Works)

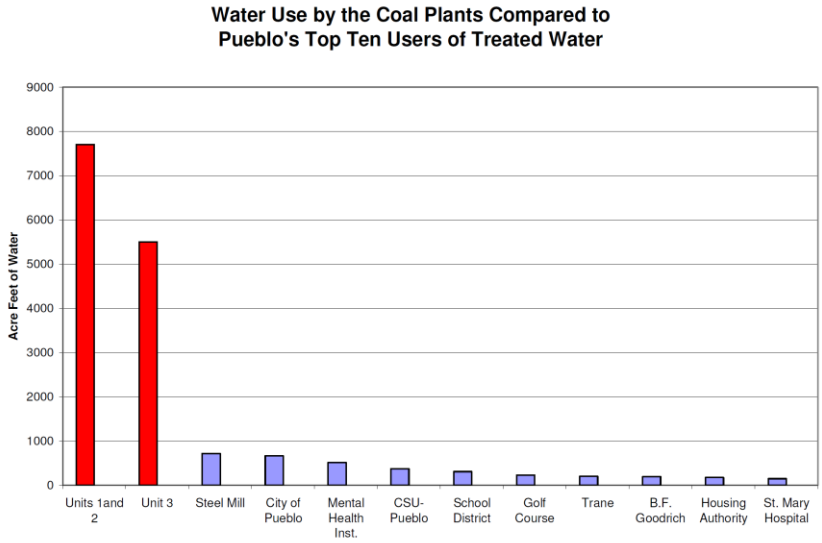
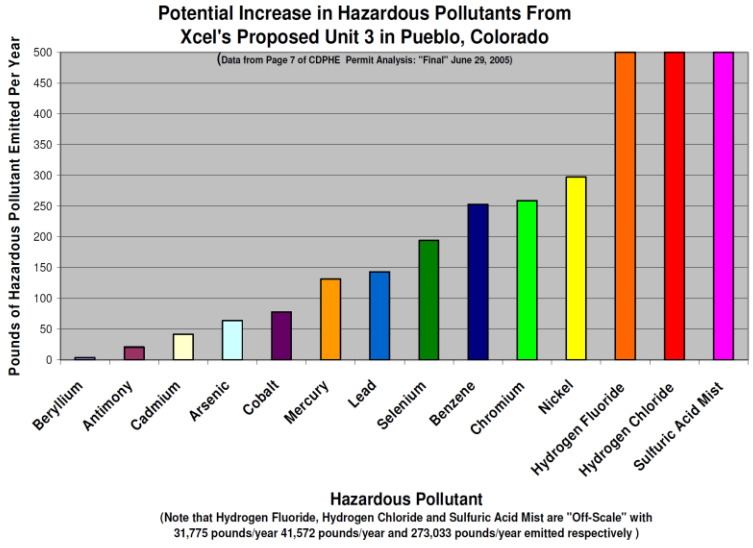


Figure LWG-PHS-9

From page 36, Attachment LWG-5. See also Hearing Exhibit 1502

Figure 5
Potential Emission of Hazardous Pollutants from the Unit 3 Coal Plant
(Data from Colorado Department of Public Health and Environment
Analysis of the Unit 3 Air Permit, July 2005



From Figure LWG-PHS-9 above, it can be seen that when Pueblo Unit 3 received its air permit in 2005, it was permitted to emit over 100 pounds of mercury a year **or over 2 pounds of mercury a week (!!!)—talk about UNCONSCIONABLE—all because Xcel crashed its stock in the summer of 2002. The community of Pueblo should take note—when your "friend" is adding over 2 pounds of mercury a week to your environment—well you probably don't need enemies…**

An October 2021 email exchange with Jackie Joyce at the Colorado Department of Public Health and Environment indicated that the current theoretical limits for mercury emissions from Pueblo Unit 3 are now about 96 pounds per year—so just a bit short of 2 pounds per week—but Ms. Joyce (the CDPHE's air pollution expert for Pueblo Unit 3) did not know how to figure out exactly how much mercury the coal plant is emitting…so much for Colorado's air pollution "experts." The email exchange with Ms. Joyce is included as Attachment LWG-7 and the key paragraph about determining current mercury emissions is copied below:

Excerpt from LWG-7
October 25, 2021 Response from Jackie Joyce at CDPHE—
Mercury Emissions from Pueblo Unit 3

> As for finding Hg emissions data for Unit 3, I am sorry but I can't be super helpful. PSCo uses a Hg CEMS for all the units at Comanche. Under the MATS rule the Hg CEMS data is reported to EPA electronically, along with other MATS reports. The public can look at the reports submitted electronically to EPA via WebFire at https://cfpub.epa.gov/webfire/ You can search for reports here https://cfpub.epa.gov/webfire/reports/esearch.cfm I was able to pull up reports. I searched for "Air Emission Reports" and for search links I picked facility location (Colorado) and then regulatory part and subpart (40 CFR Part 63 Subpart UUUUU) and it did pull up several reports for Comanche. I tried a narrow search (state and county) and didn't get much. I am not sure if you will find the Hg reports there (I just opened one and it included PM data). If the EPA reports aren't on Webfire, I don't know how you can access them.

Pueblo Unit 3 is an extremely high water user during extreme drought, emits close to 2 pounds of mercury a week plus numerous other hazardous air pollutants and generates large amounts of coal ash…

Putting aside the climate crisis,
there is <u>nothing about Pueblo Unit 3</u>
that complies with the mandate in
C.R.S. § 40-3-101(2) to ensure that public utility facilities
"promote the safety, health, comfort, and convenience of its patrons, employees and the public…."

> ***CRS 40-3-101 (2) Every public utility shall*** *furnish, provide, and maintain such service, instrumentalities, equipment, and* ***facilities as shall promote the safety, health,*** *comfort, and convenience of its patrons, employees, and the public, and as shall in all respects be adequate, efficient, just, and reasonable. (Emphasis added.)*

<u>H. The Commission Should Phase Out Pueblo Unit 3 as Quickly as Possible, but Not Make a Decision on Cost Recovery in This Resource Plan Proceeding, But Rather Decide Cost Recovery In a Separate, Dedicated Proceeding, Given the Large Amounts Involved and the Complexity of the Decision.</u>

In addition to all the other reasons that are provided by parties to this proceeding not to accept the Settlement Agreement as it is, it is also important not to accept the proposed Settlement Agreement as it legitimizes imprudent decisions—rather than correcting the abuses that have been visited on PSCo ratepayers already; correcting these abuses as mandated by C.R.S. §40-3-102 is discussed in Section I of this Statement.

The question of who pays for the remaining depreciation on Pueblo Unit 3 and how to avoid "dumping" this mistake on future generations is a complex one and the answer depends on many assumptions—including what discount rate is used.

A higher discount rate will help justify making future generations pay off the Billion Dollar Mistake (i.e. Pueblo Unit 3)—even though those that could be burdened with paying off the coal plant (e.g. in the 2030s and 2040s) often weren't even borne or were toddlers in 2005 when the decision was made to build a coal plant that was supposed to operate until 2070[28]--which of course it clearly won't.

The complexity of the decision on cost recovery is highlighted by Discovery Response CRES3-33 included as Attachment LEM-7 to Hearing Exhibit 1502 in this 21A-0141E proceeding. The key part of CRES3-33 is copied in Figure LWG-PHS-9 below. This shows the difference between a 2029 and a 2039 retirement for Pueblo Unit 3.

Ms. Glustrom is unaware of a similar comparison for a 2034 or 2027 Pueblo Unit 3 retirement, but the data in CRES 3-33 shows how important it is to PSCo to keep harvesting profits from Pueblo Unit 3 for as long as they can—all the while covering up their intentions with statements about helping the Pueblo community…definitely OUCH!!

[28] The decision to move forward with Pueblo Unit 3 (despite massive opposition from PSCo's customers and others) came in Decision C05-0049 from consolidated Proceedings 04A-214E, 04A-215E and 04A-216E, as detailed in Attachment LWG-4 to this Statement.

Figure LWG-PHS-9
Key Variables Related to Pueblo Unit 3 Asset Recovery Options—2029 (Top) v 2039 (Bottom) Retirement

Response to CRES3-33, From LEM-7, Hearing Exhibit 1502 (Also Attachment LWG-6)

RESPONSE:

Please see the table below, provided that the Company believes the discount rate at the Company's WACC is the appropriate discount rate that is consistent with past ERPs and ERP Rules:

Comanche 3 Retirement 2029 (CPUC 2-13b.A1)	**Status Quo Asset Recovery to 2069**	**Securitization 2029 through 2049**	**Accelerated Depreciation through 2039**	**Regulatory Asset through 2049**
PVRR at 6.53% Discount Rate	$896.83 M	$824.964 M	$911.413 M	$917.827 M
PVRR at 3% Discount Rate	$1,327.543M	$1,139.206M	$1,052.603M	$1,204.704M
Total Equity Return (starting in 2021)	$773.313 M	$276.728 M	$194.759 M	$415.558 M
Total Debt Return (starting in 2021)	$255.633 M	$96.467 M + approximately $219 M of securitization interest	$67.893 M	$144.863 M
Total Income Taxes (starting in 2021)	$239.180 M	$90.259 M	$63.523 M	$135.540 M

RESPONSE TO DISCOVERY REQUEST CRES3-33 CONT'D:

Comanche 3 Securitization 2039 (SAW-6)	**Status Quo Asset Recovery to 2069**	**Securitization 2039 through 2059**	**Accelerated Depreciation through 2039**	**Regulatory Asset through 2049**
PVRR at 6.53% Discount Rate	$938.99 M	$908.066 M	$941.261 M	$946.949 M
PVRR at 3% Discount Rate	$1,408.015M	$1,324.017M	$1,197.381M	$1,361.390M
Total Equity Return (starting in 2021)	$787.591 M	$520.860 M	$344.661 M	$632.315 M
Total Debt Return (starting in 2021)	$274.553 M	$181.571 M + approximately $176 M of securitization interest	$120.148 M	$220.424 M
Total Income Taxes (starting in 2021)	$256.883 M	$169.885 M	$112.416 M	$206.238 M

Sponsor: Scott A. Watson **Response Date:** August 16, 2021

Table LWG-PHS-4
Difference in PSCo's Equity Returns Between a 2029 and 2039 Retirement of Pueblo Unit 3 Coal Plant

Calculations by PSCo from Discovery Response CRES3-33, Found in LEM-7, Hearing Exhibit 1502, 21A-0141E

Asset Recovery Option	PSCo Equity Returns 2029 Retirement	PSCo Equity Returns 2039 Retirement	Increase in PSCo's Equity Returns for 2039 v 2029 Retirement
Securitization	$276.7 Million	$520.9 Million	**$244.2 Million**
Accelerated Depreciation	$194.8 Million	$344.7 Million	**$149.9 Million**
Regulatory Asset	$415.6 Million	$632.3 Million	**$207.7 Million**

From Table LWG-PHS-4 above, it can be seen that PSCO's equity returns for a 2039 retirement are about $150-$250 more when compared to a 2029 retirement. Similar numbers are not available for a 2034 retirement, but the principle is clear—**the longer Xcel can keep Pueblo Unit 3 in the rate base, the bigger the "return on" and profits they make on the coal plant**—with current "return on" being over $40 million per year (See Table LWG-PHS-3 above.)

Let's be clear—very clear--

Xcel is NOT protecting the Pueblo community.

Xcel is protecting their profits from the Pueblo Unit 3 coal plant—Given what we know about the climate crisis this is

WAY BEYOND UNCONSCIONABLE!!

It is like pouring kerosene on your neighbor's burning home and asking to make a profit doing so—

all while pretending you are a good neighbor….

OUCH!!

The data in Table LWG-PHS-4 above also make it clear that the ranking of asset recovery mechanisms is dependent on the discount rate that is used. This makes sense because any plan to use securitization in the future "dumps" the Billion Dollar Mistake (i.e. Pueblo Unit 3) on to future generations. Using a lower discount rate unmasks this and shows that Accelerated Depreciation has a lower PVRR than securitization because you are not discounting future costs so heavily. The importance of discount rate in financial analyses will be discussed further below.

In addition, of course, the PUC should be taking a hard look at what costs undertaken at Pueblo Unit 3 were prudently incurred before deciding which amounts ratepayers should be responsible for paying off. This will be a complex question that deserves its own thoughtful and fully litigated proceeding.

V. IT IS JUST PLAIN BONEHEADED (AND IMPRUDENT) TO TALK ABOUT COAL PLANT OPERATIONAL TIMEFRAMES WITHOUT ONCE ASKING WHETHER THE COAL PLANT WILL HAVE A COAL SUPPLY….[29]

OK—"Boneheaded" is strong language—but I could have used much worse…

[29] On May 24, 2021 in this 21A-0141E proceeding, Ms. Glustrom submitted a data-rich explanation of why Xcel's coal projections were faulty in numerous ways and why the Commission should request Supplemental Direct Testimony addressing these inadequacies, but, as usual, there is no indication that the Commissioners or their Staff read or understood what the data are showing.

But think about it—there are tens of thousands of pages of testimony in this 21A-0141E proceeding (and all the coal-related proceedings before this one) and there is no thoughtful discussion by the Commission or the Commission Staff or the other parties[30] of whether Pueblo Unit 3 or Brush (the one Xcel calls "Pawnee"—again the Native Americans probably don't want coal plants named after them…) or Hayden will have a reasonably-priced coal supply…Yes—that is **Boneheaded!!**

I've written this up so many times for the PUC I am going to, as they say, "lose my lunch…," but I'll try one more time.

This section will be a bit heavy on the sarcasm—but if you'd been trying for as long as I have been[31] to get decision-makers to pay attention to the facts instead of assuming that coal would just fall out of the sky for as long as Americans want it to, then you'd probably be pretty frustrated too….Besides sarcasm will give you a change of pace from PSCo's insipid, self-serving PR…

<u>Quick version</u>—Coal doesn't mine itself and it doesn't fall out of the sky. There is lots of coal left in the ground in the US, but it is buried too deeply to be mined at a profit—and coal companies don't mine coal as a non-profit/losing venture for long…

[30] Ms. Glustrom has submitted extensive coal supply information, data and reports in numerous proceedings including 07A-447E, 08S-520E, 09AL-299E, 10M-245E and 11A-325E, 11A-869E, 11A-917E and 16A-0396E. Of course, having "caught Xcel out" for not having analyzed their coal supply before building Pueblo Unit 3 (yup—that was a boneheaded thing to do, shall we say…), Xcel decided to "shoot the messenger" and start objecting to my interventions—and sadly, then PUC Chairman Josh Epel and since then, Advisory Staff member Paul Gomez and other Commission Advisory Staff, decided that rather than face their role in the Billion Dollar Mistake, they should make it their mission to keep the *public* from meaningful engagement at the *Public* Utilities Commission—Ghee—great to have such fine **<u>public</u>** servants on the PUC payroll…Please forgive me—it isn't fun to watch your state make a Billion Dollar Mistake that is fueling climate chaos (think over 1000 homes incinerated in an afternoon!!!) when they could have easily avoided it if they had just listened to the hundreds of voices warning them—and if they had ever bothered to stop assuming that coal doesn't mine itself and began asking some intelligent questions…..

[31] A 2009 YouTube talk by Ms. Glustrom in Michigan on US coal supply constraints can be found at https://www.youtube.com/watch?v=t0y3KPmM22g It is a 20 min video if you want the quick version…2009 is a long time ago now—and I'd already been "at it" for many years—first seriously trying to get the Colorado PUC to consider coal supply issues in the 07A-447E 2007 Xcel Resource Plan proceeding.

We've seen the financial challenges facing the US coal industry over and over again with dozens of coal company bankruptcies in the last decade and more very likely to come.

Assuming coal will just show up to 2070, 2039, 2034 or even 2027 is, well, shall we say…

BONEHEADED…..

Since I don't think this Commission wants to do something that is boneheaded, let's start with three key facts:

1) Coal is non-renewable…(Doh, you know that!) The coal we are mining was made tens and hundreds of millions of years ago under unique geologic conditions and the planet is not making any more coal on any time scale that matters

2) Coal does not mine itself (Wow—you know that too—IF you think about it!)—Coal mining is a *very* capital intensive business. Sadly, though Xcel keeps paying Bob Burnham to do coal supply analyses and Mr. Burnham makes the assumption that coal in the ground can be called "reserves" and it will mine itself and show up at Colorado's coal plants[32]—and sadly no one on the PUC Staff knows enough to point out that this is a silly assumption…Gheez…no wonder I'm getting more than a little frustrated!!

Let's try a picture since the Colorado PUC and its Staff have been such extremely slow learners on this account…See that equipment in the picture below—it is big and EXPENSIVE

[32] See the Burnham coal report filed in this 21A-0141E Proceeding as Appendix F to AKJ-2, Hearing Exhibit 101

and the deeper the coal is buried the more equipment and time and labor and dynamite you need to get to it…

In short, **the deeper the coal is buried, the more expensive it will be to mine it** and with pressure from other fuels and generation options, prices will be held down meaning…(See #3 below…)

https://pixabay.com/photos/industry-dumper-minerals-coal-2023592/

3) Most of the US Coal That Can be Mined At a Profit Has Already Been Mined and is Now Carbon Dioxide in the Atmosphere and Oceans: There is lots of coal remaining underground in the United States, but it is often owned by the federal government, legally difficult to access and **buried too deeply to be mined at a profit.**

All of this has been well documented by the United States Geological Survey (USGS) and written up for the layperson by Ms. Glustrom. Ms. Glustrom's thoroughly referenced, 76-page 2013 report (the one I wrote after the thoroughly referenced 2009 report fell on deaf ears—

along with a 2009 front page Wall Street Journal article on the subject)[33] is attached as **LWG-8**—"**Warning: Faulty Reporting of US Coal Reserves."** **The report is very detailed and thoroughly referenced**—please at least glance at it to know what the data show instead of assuming coal will "show up" just because the Colorado PUC has repeatedly decided on a retirement dates for coal plants without any serious discussion of future coal supply.

While the Commissioners may not be familiar with the third coal fact above, this Commission is certainly smart enough to recognize the first two points—

1) Coal is non-renewable and

2) Coal doesn't mine itself.

Understanding the third point about the remaining US coal being buried too deeply to be mined at a profit takes paying attention to the US coal industry, following their financial reports and learning the geology—all things Ms. Glustrom has been doing since the early 2000's….

A good start in understanding the geology underlying point #3 about how much US coal remains that can be mined at a profit can be had by watching Ms. Glustrom's 2009 YouTube (about 20 min)[34] or reading (or skimming…) **LWG-8—Faulty Reporting of US Coal Reserves.**

Ms. Glustrom will also provide some updated information below—or of course *the Commission and PUC Staff could just continue to assume that coal will mine itself and show up*

[33] The 2009 front page Wall Street Journal (WSJ) article can be found at https://www.wsj.com/articles/SB124414770220386457 (Believe me you don't get front page WSJ articles—especially from Rebecca Smith, an excellent WSJ reporter who helped break the Enron story, without a tremendous amount of work and EXTENSIVE vetting…) but being Americans, we continued to assume that coal will just keep showing up for as long as we decree it to…even when the front page of the WSJ reminds us it won't….

[34] A 2009 YouTube talk by Ms. Glustrom in Michigan on US coal supply constraints can be found at https://www.youtube.com/watch?v=t0y3KPmM22g It is a 20 min video if you want the quick version…Ms. Glustrom gave coal supply talks all over the country, but this one is on YouTube.

in Pueblo (and Brush and Hayden) for as long as the Colorado PUC decrees that it should—but, hey that would be, you got it—

BONEHEADED….

If you want a quick view of how Xcel's past predictions about coal supply have been seriously wrong, see Xcel's see Xcel's 2011 Coal Report (MWR-1, Proceeding 11A-869E) or their 2018 Burnham Coal Report (16A-0396E, submitted in October 2018) and see how well these "experts" predictions have been borne out by time…

Table LWG-PHS-5
2020 Projections from Xcel's Coal Reports
Compared to Actual 2020 Production

	2011 Boyd Projection in11A-869E for 2020 Production	2018 Burnham Projection (16A-0396E) for 2020 Production[35]	**Actual 2020 Production[36]**
Black Thunder	125 Million Tons	70.5 Million Tons	**50.2 Million Tons**
Belle Ayr	25 Million Tons	15.8 Million Tons	**11.17 Million Tons**
Eagle Butte	20 Million Tons	17.3 Million Tons	**12.3 Million Tons**
North Antelope Rochelle	100 Million Tons	101.6 Million Tons	**66.1 Million Tons**

From Table LWG-PHS-5, it becomes clear what happens when it is assumed that coal in the ground will mine itself—Your projections are way off—even ones submitted in late 2018! There are numerous ridiculously-bad-no-good predictions in the Boyd (2011) and Burnham

[35] Burnham's 2018 Projections are found in Table 4 at the back of the 2018 Report submitted in Proceeding 16A-0396E

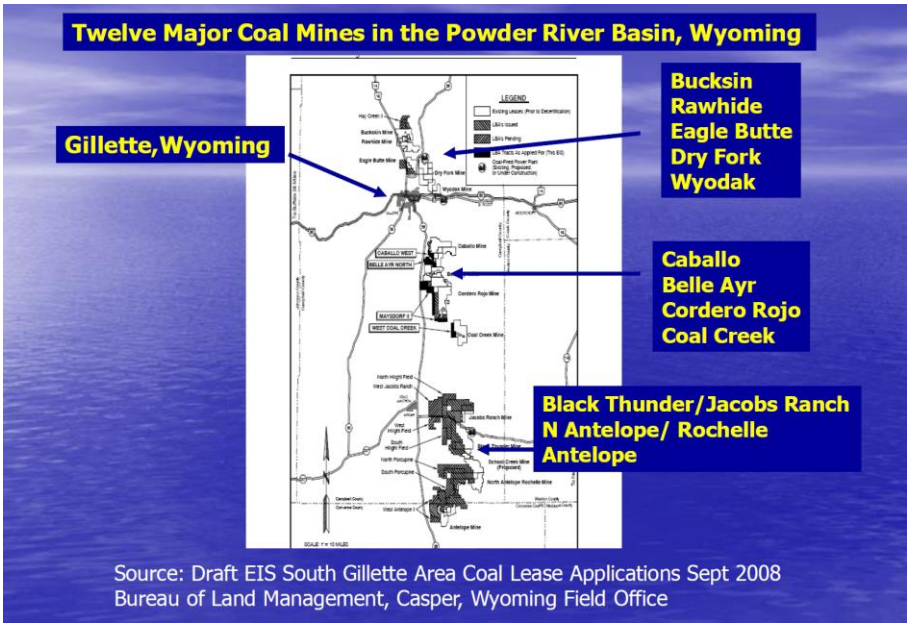
[36] Actual coal mine production by year can be gotten from the Energy Information Administration's Annual Coal Rep
ort, Table 9 found at https://www.eia.gov/coal/annual/

(2018) coal reports that PSCo has submitted to the Colorado PUC, but since no one is paying attention, and calling Xcel on it, PSCo just keeps doing it…and of course their customers keep being charged for these ridiculously bad projections…Ho Hum—

Once again the Colorado PUC is allowing PSCo to abuse their customers with bad information and paying for poor quality products, but no one on the PUC Staff seems to understand or care…Ho Hum—Just another joy of Xcel's monopoly and of course it is easier to just deny Ms. Glustrom intervention rather than try to understand what is going on with Xcel's coal suppliers…Arrrgh….

For reference, there are twelve mines in the Powder River Basin (until the Coal Creek mine closes in 2022).[37] A PPT slide with a map showing these mines is below.

Figure LWG-PHS-10
Coal Mines of the Powder River Basin in Wyoming[38]

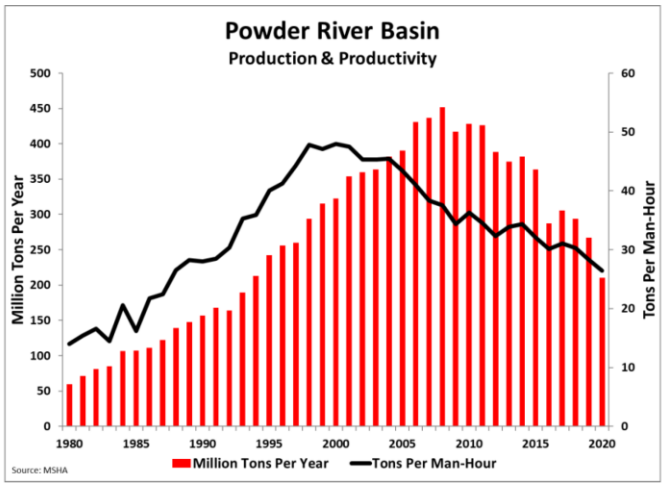


[37] See https://www.wyofile.com/another-blow-to-coal-arch-to-close-coal-creek-mine-in-2022/
[38] The map showing the PRB coal mines is from a 2008 document, but don't worry, coal mines don't change location….

Xcel's Coal Report in this 21A-0141E proceeding[39] also makes monumentally questionable assumptions about the future of coal production and assumes that coal in the ground can "mine itself," and show up at Xcel's coal plants, but it does record the history generally accurately. Figure 8 below from the Burnham coal report in this 21A-0141E proceeding gives a good snapshot of the history of Powder River Basin ("PRB"), where Xcel gets all its coal for the Brush and Pueblo coal plants.

Figure LWG-PHS-11
Powder River Basin Coal Production and Productivity, 1990-2020
From Hearing Exhibit 101, AKJ-2, Appendix F—Burnham Coal Report

Figure 8 – PRB Labor Productivity 1980-2020



It is clear from Figure 8 in the 2021 Burnham Coal Report shown in Figure LWG-PHS-11 above, that coal production in the PRB is following the basic bell-shape curve that goes with depletion of a non-renewable resource (red bars) and that productivity (Tons of Coal Per "Man"-

[39] 21A-0141E, Hearing Exhibit 101,AKJ-2, Appendix F—Burnham Coal Report

Hour) has dropped off significantly from its peak around the year 2000. This is the basic pattern that has happened in each area that has mined coal. While there are year-to-year variations, overall, the production follows the basic bell-shaped curve of resource depletion. See Attachment LWG-8 for more examples

One of the key issues is that Americans have assumed that coal in the ground will just mine itself for as long as we want it to show up, almost as if it was a Constitutional right to burn non-renewable fuels for as long as we want….This is the unspoken assumption in tens of thousands of pages of testimony and exhibits in this 21A-0141E proceeding. Also, the Energy Information Administration has made the mistake of calling coal in the ground "reserves" without assessing it for whether it can be mined at a profit—(See LWG-8 for a thoroughly-referenced discussion.)

Truth is I've lost faith that anyone reads these carefully researched and generally carefully written filings that I make at the Colorado PUC, so for an update on the US coal industry and Xcel's suppliers for their Colorado coal plants, I'll largely just refer anyone that is interested to my Petition to Intervene in this 21A-0141E proceeding which includes a detailed analysis of Xcel's coal report (Appendix F to AKJ-2).

There is a lot to be known about the geology of US coal and the finances of the US coal companies, but no one besides Ms. Glustrom seems to think it is important—because you know, it is just a lot easier to assume the coal will mine itself and "fall out of the sky" for as long as we want it to…but below are a few basic questions and answers for anyone that wants to take something other than a BONEHEADED approach to the critically important topic of coal supply….

COAL SUPPLY QUESTION NUMBER 1

DID XCEL ANALYZE ITS COAL SUPPLY BEFORE BUILDING THE "BILLION DOLLAR MISTAKE" (aka PUEBLO UNIT 3 OR "COMANCHE 3")?

ANSWER NUMBER 1—NO. Full Stop.

Huh—Xcel spent a billion dollars on a new coal plant and never analyzed its coal supply? Really?? Yup! That's right. They were asked numerous times in discovery before Chairman Epel and Commission Counsel Paul Gomez decided they would protect the *Public* Utilities Commission from the pesky *public* like me…Below is one discovery response that goes back to the 2007 Xcel Resource Plan—Proceeding 07A-0447E….(GHEEZ—no wonder I'm getting tired—2007 was a looong time ago now—and still everyone at the Colorado PUC continues to assume that coal will just "fall out of the sky…." GHEEZ—What will it take to have a thoughtful discussion about coal supply when we are talking about Colorado coal plants?????)

Attachment 48
Docket 07A-447E
Glustrom Answer Testimony

Re: In The Matter of the Application of Public Service Company of Colorado For Approval of its 2007 Colorado Resource Plan	)	**Fifth Set of Discovery Requests Of Ms. Glustrom Served On Public Service Company**
Docket No. 07A-447E	)	**March 28, 2008**

DISCOVERY REQUEST LWG5-11:

Please provide all analyses of constraints in future coal supply as a result of increasing overburden and other geologic and surface constraints in the Powder River Basin.

RESPONSE:

No such analysis conducted by PSCo exists.

Sponsor: Kathryn Valdez **Response Date:** April 18, 2008

Well, read Xcel's response above and shake your head….I mean even 6 year olds know you can't start a lemonade stand without a supply of lemonade—but Xcel built a billion dollar coal plant and just assumed the coal would show up until 2070---GHEEZ AND MORE

GHEEZ—and they want to take over $100 million from ratepayers every year to pay for this Billion Dollar Mistake???

Let's label it—

SMARTER THAN XCEL'S MILLION DOLLAR EXECS…

See <u>These</u> Young Business Owners Analyzed Their Supply Chain and <u>They</u> Have A Supply Of Lemons Unlike Xcel's Execs Who Failed to Analyze Their Coal Supply Chain for Coal Before Building Pueblo Unit 3

https://www.istockphoto.com/search/2/image?phrase=lemonade%20stand&family=creative

<u>COAL SUPPLY QUESTION NUMBER 2</u>

WHY SHOULDN'T WE ASSUME THAT COAL WILL JUST SHOW UP FOR AS LONG WE WANT IT TO?

<u>ANSWER NUMBER 2</u>—Well—glad you (finally…) asked!! Coal doesn't mine itself and the easily accessible coal has already been mined and turned into carbon dioxide in the atmosphere and oceans (see attachment LWG-8 for the thoroughly referenced discussion of coal reserves and the US coal industry…)

COAL SUPPLY QUESTION NUMBER 3

WHAT DO WE KNOW ABOUT THE COAL SUPPLIERS TO XCEL'S COLORADO COAL PLANTS?

ANSWER NUMBER 3

Wow—that is a great question. It took you awhile—and after almost twenty years of this "Cat and Mouse" game with Xcel (you can guess who thinks they are the cat…),well I'm pretty tired now, but try this

First-The Belle Ary and Eagle Butte Mines (Formerly Sole Suppliers to Xcel in Colorado) Are Playing Out; The Last Two Times They Changed Hands, the Seller Paid Buyer (Yup—the Seller Paid the Buyer!!): Xcel used to be supplied exclusively by the Belle Ayr mine for the Pueblo coal plants and the Eagle Butte mine for the Brush coal plant (the one Xcel calls "Pawnee.")[40] Those mines are playing out and now their reclamation obligations are so large that the last two times they changed hands the seller sold the buyer to take the mines—Yes—that's right—the **SELLER PAID THE BUYER—which of course not how a usual business transation occurs.** Such is the nature of trying to scrape the bottom of the barrel of coal that is no longer profitable to mine—(like that Peanut Butter Jar I used one time to try to get the Commission to understand about "scraping the bottom of the barrel," but sadly even using a peanut butter jar the Commissioners (and their Staff) didn't seem to get it…Ho Hum…Rather than consider the difficult concept that coal doesn't mine itself (well, maybe not so difficult), the Commissioners and their Staff seemed to have decided it was a good time to "shoot the

[40] Coal supply to US coal plants can be tracked on the EIA 923 data base, Sheet 5. Ms. Glustrom has a lot of this historical data for Xcel's Colorado coal plants and has repeatedly submitted it in Colorado PUC proceedings (but she doesn't have time to track it down now) or it can be reproduced through the EIA 923 database https://www.eia.gov/electricity/data/eia923/ For a snapshot of coal suppliers to Xcel in 2011, try PSCo's 2011 coal report, MWR-1 in proceeding 11A-869E.

messenger—and so they did…." But Ms. Glustrom, being a "zombie" who believes in the power of data and that "facts are stubborn," didn't go away…Oh well…here she is—trying yet again….

Here is the story of the Belle Ayr and Eagle Butte mines with references, copied from something else that Ms. Glustrom wrote.

> The future of the Belle Ayr and Eagle Butte mines is very questionable. While there is still coal left in the ground, it now appears that the reclamation obligations on the mine are larger than the value of the mine as remarkably, the **last two times the Belle Ayr and Eagle Butte mines have changed hands, the seller has paid the buyer to take the mine! (Yes, the seller paid the buyer.)** This is documented on pages 18 and 19 of the Burnham Coal Report, but it is buried in text that is not easy to follow. Here is a short history of the Belle Ayr and Eagle Butte mines over the last several years.
>
> - In 2015, then owner of the Belle Ayr and Eagle Butte [41]mines, Alpha Natural Resources filed for bankruptcy. [42]As a result of the bankruptcy, the Belle Ayr and Eagle Butte mines were transferred to Contura.
> - In 2017, Contura paid Black Jewel $20 million to take the Belle Ayr and Eagle Butte mines[43]but the permits were never transferred to Black Jewel and Black Jewel filed for bankruptcy in July 2019 and the mines remained the legal responsibility of Contura.
> - In October 2019, Contura once again sold the Belle Ayr and Eagle Butte mines and once again **paid the "buyer"** (in this case Eagle Specialty Minerals) to

[41] Until 2005 the Eagle Butte was the sole supplier of Xcel's coal plant in Brush, Colorado (which Xcel calls "Pawnee.") and the Belle Ayr was the sole supplier to the Pueblo coal plants. The Eagle Butte continues to provide significant amounts of coal to Xcel's Brush coal plant.

[42] For a description of the 2015 Alpha Natural Resources bankruptcy, see https://www.forbes.com/sites/nathanvardi/2015/08/03/u-s-coal-company-alpha-natural-resources-files-for-bankruptcy/?sh=1249e4404379

[43] For Contura paying Black Jewel to take the Belle Ayr and Eagle Butte mines in late 2017, see https://www.coalage.com/breaking-news/contura-pays-90m-to-blackjewel-spinoff-to-take-prb-mines/

take the mines. [44] (As can be seen in Attachment LWG-9,[45] the reclamation obligation on the Belle Ayr and Eagle Butte mines is over $200 million.) This "deal" involved Contura paying Eagle Specialty Minerals a total of $90 million to take the mines.

Second--Arch Coal, Owner of the Black Thunder Mine and Major Supplier to Xcel, is Planning on Leaving the Powder River Basin:[46] Arch Coal, now the primary supplier of coal to the Pueblo coal plants, has realized that it can't make much of a profit mining the remaining coal in the Powder River Basin, so it has announced its intention to leave. There has been lots of press in Wyoming about this, but of course the rest of the country just keeps assuming the coal will mine itself—I mean Americans will be Americans and as Americans and all we can just ignore those pesky, inconvenient facts and assume that coal will just "fall out of the sky."

Third—Peabody Energy, a potential back-up supplier to Xcel Could Easily Face a Second Bankruptcy in the Middle of This Decade:[47] Enough is enough, no one is probably reading this any way because of course we don't need to pay attention to coal supplies—we can just assume that coal will mine itself and show up at Pueblo Unit 3 for as long as we decide it should…but if

[44] For Contura paying Eagle Specialty Minerals to take the Belle Ayr and Eagle Butte mines , see https://www.coalage.com/breaking-news/contura-pays-90m-to-blackjewel-spinoff-to-take-prb-mines/

[45] Ms Glustrom received the reclamation obligation numbers from the Wyoming Department of Environmental Quality through in information request in September 2021. The results are attached as LWG-9.

[46] One of many stories about Arch Coal leaving the Powder River Basin can be found at https://trib.com/news/state-and-regional/major-wyoming-coal-company-suffers-huge-losses-plans-to-divest-from-thermal-coal/article

[47] Here are a few stories about Peabody (#1 US coal producer), which filed for bankruptcy in 2016 and could face a second bankruptcy in the 2020s…https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/coal-producer-peabody-faces-big-challenges-as-potential-2nd-bankruptcy-looms-61479849 or https://www.wyomingpublicmedia.org/natural-resources-energy/2021-01-04/peabody-energy-buys-itself-time-amidst-bankruptcy-risk or https://seekingalpha.com/article/4431371-peabody-energy-crunch-time-2024-if-it-survives-until-then

anyone cared, they'd find out that **all the coal companies are facing the same basic problem which is that the coal that is left in the ground is generally buried too deeply to be mined at a profit and the major US coal companies are in seriously bad financial shape just leaving the "bottom feeders" to close out the US coal industry,** but it seems that Ms. Glustrom is the only one who thinks it isn't OK to just assume coal will mine itself…

If you prefer not to take a bone-headed approach, you can turn to the Institute for Energy Economics and Financial Analysis—they will provide an assessment of the US coal industry that doesn't assume coal mines itself and understands that the easiest accessible coal is long gone. Here is a link to one detailed report if you care…

https://ieefa.org/ieefa-report-powder-river-basin-coal-industry-is-in-long-term-decline/

For even more details and maps of the PRB mines etc you could try reading the filing Ms. Glustrom made on May 24, 2021 in this proceeding detailing many of the boneheaded assumptions in PSCo's coal report (Appendix F to AKJ-2, Proceeding 21A-0141E).

In case you want to get started, below are some of the financial data for Peabody—the #1 US supplier—You can see for yourself that Peabody is not making a profit (despite having shed billions in debt in its first round of bankruptcy) and that it has serious debt (i.e. hundreds of millions of dollars…) due in 2024 and 2025…

I don't know why I keep thinking that someone might actually examine the data, but I seem to be compelled to keep trying…

Figure LWG-PHS-12
Excerpts from Peabody's 2021 Q3 Financial Report

Available from https://www.peabodyenergy.com/Investor-Info/Financial-Information/SEC-Filings

PART I - FINANCIAL INFORMATION

Item 1. Financial Statements.

PEABODY ENERGY CORPORATION
UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
	(Dollars in millions, except per share data)			
Revenues	$ 679.0	$ 671.0	$ 2,053.7	$ 2,143.9
Costs and expenses				
Operating costs and expenses (exclusive of items shown separately below)	649.4	550.9	1,843.4	1,886.7
Depreciation, depletion and amortization	77.9	72.2	223.3	266.5
Asset retirement obligation expenses	14.3	14.3	45.3	46.0
Selling and administrative expenses	21.1	27.2	64.2	77.3
Restructuring charges	1.7	8.1	5.9	31.1
Transaction costs related to joint ventures	—	6.0	—	23.1
Other operating (income) loss:				
Net gain on disposals	(25.8)	(2.5)	(28.2)	(10.4)
Asset impairment	—	—	—	1,418.1
(Income) loss from equity affiliates	(15.8)	10.6	(11.4)	25.7
Operating loss	(43.8)	(15.8)	(88.8)	(1,620.2)
Interest expense	45.5	34.9	143.3	102.3
Net gain on early debt extinguishment	(16.0)	—	(31.3)	—
Interest income	(1.4)	(1.6)	(4.2)	(7.1)
Net periodic benefit (credit) costs, excluding service cost	(8.6)	2.8	(26.0)	8.3
Net mark-to-market adjustment on actuarially determined liabilities	—	13.0	—	13.0
Loss from continuing operations before income taxes	(63.3)	(64.9)	(170.6)	(1,736.7)
Income tax (benefit) provision	(3.7)	(0.1)	(10.3)	2.7
Loss from continuing operations, net of income taxes	(59.6)	(64.8)	(160.3)	(1,739.4)
Income (loss) from discontinued operations, net of income taxes	24.3	(2.3)	20.0	(6.8)
Net loss	(35.3)	(67.1)	(140.3)	(1,746.2)
Less: Net income (loss) attributable to noncontrolling interests	8.9	0.1	12.6	(5.1)
Net loss attributable to common stockholders	$ (44.2)	$ (67.2)	$ (152.9)	$ (1,741.1)
Loss from continuing operations:				
Basic loss per share	$ (0.60)	$ (0.66)	$ (1.65)	$ (17.76)
Diluted loss per share	$ (0.60)	$ (0.66)	$ (1.65)	$ (17.76)
Net loss attributable to common stockholders:				
Basic loss per share	$ (0.38)	$ (0.69)	$ (1.46)	$ (17.83)
Diluted loss per share	$ (0.38)	$ (0.69)	$ (1.46)	$ (17.83)

See accompanying notes to unaudited condensed consolidated financial statements.

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(11) Long-term Debt

The Company's total funded indebtedness (Indebtedness) as of September 30, 2021 and December 31, 2020 consisted of the following:

Debt Instrument (defined below, as applicable)	September 30, 2021	December 31, 2020
	(Dollars in millions)	
6.000% Senior Secured Notes due March 2022 (2022 Notes)	$ 23.1	$ 459.0
8.500% Senior Secured Notes due December 2024 (Peabody Notes)	128.8	—
10.000% Senior Secured Notes due December 2024 (Co-Issuer Notes)	193.9	—
6.375% Senior Secured Notes due March 2025 (2025 Notes)	462.4	500.0
Senior Secured Term Loan due 2024 (Co-Issuer Term Loans)	206.0	—
Senior Secured Term Loan due 2025, net of original issue discount (Senior Secured Term Loan)	328.7	388.2
Revolving credit facility	—	216.0
Finance lease obligations	30.4	27.3
Less: Debt issuance costs	(45.1)	(42.7)
	1,328.2	1,547.8
Less: Current portion of long-term debt	59.5	44.9
Long-term debt	$ 1,268.7	$ 1,502.9

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No one knows how the complex forces of supply, demand and public policy will play out in this decade, but there is good reason to believe that coal mining will continue to drop off during the 2020s. Simply assuming that someone will mine the coal and make it show up at Pueblo Unit 3 until 2034 is well, shall we say BONEHEADED…even 2027 is questionable given the geologic, legal and financial constraints facing the US coal industry—and, of course, no one can change the geology of coal…and if "God" decides to rearrange the geology of coal (i.e. the caldera under our geologic neighbor Yellowstone[48] explodes or some such thing…) then we are all in seriously bad trouble…seriously bad…

Bottom line: No one knows what the future will bring (shall we say!!), but there is good reason to believe that the US coal industry is in structural decline with significant probabilities that US coal mining will go through serious disruptions in this the decade of the 2020s.

The PUC should monitor this carefully through well-vetted studies so it can best be prepared for possibly serious disruptions of the US coal industry in the next 5-7 years—or less….

[48] For background on the Yellowstone caldera and possible explosion who knows when, see https://en.wikipedia.org/wiki/Yellowstone_Caldera

VI. DITTO FOR THE OTHER COAL PLANTS—BRUSH ("PAWNEE") AND HAYDEN

A. Phase Out Coal Quickly—It is Beyond Unconscionable to Continue Burning Coal

See above for the many reasons why coal should be phased out quickly—in short it is **UNCONSCIONABLE** to be burning coal at this stage of the climate crisis (and consuming water and emitting mercury, arsenic, lead and acid gases and creating more coal ash etc. etc.) when we have low-cost and much cleaner alternatives.

B. Don't Assume Coal Will Just Show Up at Xcel's Coal Plants

See above. Coal really, truly does **not** fall out of the sky just because we want it to. The coal that is left in the ground in the United States is generally **buried too deeply to be mined at a profit** and coal companies don't mine coal for long if they can't make a profit and pay their looming debts…There are many good reasons to question whether Xcel will have a coal supply even to 2027, what's less 2030 or 2034.

C. Don't Make a Decision on Asset Recovery Now—Do It in a Separate Proceeding

Importantly, PSCo just made large capital expenditures at the Brush (i.e. "Pawnee") and Hayden coal plants under what was misleadingly[49] named the "Clean Air Clean Jobs" ("CACJ") Proceedings (10M-245E, 11A-315E and 11A-917E) proceedings. Below are summaries of those expenditures--$271 Million on the Brush Coal Plant and about $70 million (PSCo share) Hayden 1 and 2 coal plants.

[49] Clean Air Clean Jobs allowed for lots of expenditures on natural gas plants, and although it wasn't in the enabling legislation, the "deal" that was negotiated allowed PSCo to make large capital expenditures at the Brush and Hayden coal plants on pollution controls for sulfur, nitrogen and mercury—all things that should have been done decades earlier… For more background and a quick summary of how CACJ applied to the aging Hayden and Brush coal plants see https://www.denverpost.com/2011/01/20/guest-commentary-why-invest-in-old-coal-plants/

All of this should be considered carefully in a separate proceeding to ensure that ratepayers are not asked to pay for imprudent expenditures.

Figure LWG-PHS-13
PSCo's Spending on Brush (aka "Pawnee") Under Clean Air Clean Jobs

Excerpt from April 2015 PSCo Report on the CACJ Brush Expenditures (11A-0315E)[50]

Xcel Energy

Pawnee CACJA Summary Cost Estimate

CONTRACT		Baseline Estimate	Current Estimate	Budget Delta	Spent to-date	
	Description	01-Jun-10	31-Dec-14		$	%
Direct Contracts						
AE	Engineering & Service Contracts	12,934,711	15,187,852	-2,253,141	15,169,541	99.9%
CC	Construction Contracts	74,269,921	148,528,919	-74,258,998	148,499,326	100.0%
CE	Controls Equipment	528,217	1,649,843	-1,121,626	1,649,843	100.0%
EE	Electrical Equipment	2,291,000	4,538,138	-2,247,138	4,515,846	99.5%
ME	Mechancial Equipment	113,826,721	88,490,432	25,336,289	88,397,816	99.9%
	Totals	$203,850,570	$258,395,184	-$54,544,614	$258,232,371	100%
Indirects						
ZA	Misc Site P.O.s	2,166,697	607,189	1,559,508	568,451	93.6%
ZH	Xcel Energy Costs	5,653,513	1,801,396	3,852,117	1,733,396	96.2%
ZL	Xcel Energy Labor	4,584,220	4,481,322	102,898	4,453,632	99.4%
ZS	Staff Augmentation Contracts	4,250,000	6,485,043	-2,235,043	6,482,253	100.0%
ZZ	Contingency and Escalation	31,539,542	0	31,539,542	0	0.0%
	Totals	$48,193,972	$13,374,950	$34,819,022	$13,237,732	99.0%
	ENERGY SUPPLY TOTAL	$252,044,542	$271,770,134	-$19,725,592	$271,470,103	99.9%

Below is the CACJ summary for the Hayden 1 and 2 coal plants.

[50] Ms. Glustrom believes that PSCo filed for something closer to $290 million in cost-recovery for the Brush coal plant CACJ expenditures, but she doesn't have time to track it down (try 19AL-0268E??)

Figure LWG-PHS-14
Excerpt from the final (or close to final) PSCo report on CACJ expenditures at the Hayden 1 and 2 coal plants

Excerpt from PSCo Update in Proceeding 11A-917E

Xcel Energy

Hayden SCR Unit 1 Summary Cost Estimate

CONTRACT	Description	Baseline Estimate 01-Sep-11	Current Estimate 31-Dec-16	Budget Delta	Spent to-date 31-Dec-16 $	Spent to-date 31-Dec-16 %
Direct Contracts						
AE	Engineering & Service Contracts	4,277,000	3,625,352	$ 651,648	3,625,352	100.0%
CC	Construction Contracts	21,728,000	29,425,426	$ (7,697,426)	29,425,426	100.0%
CE	Controls Equipment	0	452,534	$ (452,534)	452,534	100.0%
EE	Electrical Equipment	1,559,000	0	$ 1,559,000	0	0.0%
ME	Mechancial Equipment	20,843,000	19,782,986	$ 1,060,014	19,782,986	100.0%
	Totals	**$48,407,000**	**$53,286,298**	**$ (4,879,298)**	**$53,286,298**	**100%**
Indirects						
ZA	Misc Site P.O.s	445,000	658,479	$ (213,479)	658,479	100.0%
ZH	Xcel Energy Costs	1,838,000	500,463	$ 1,337,537	500,463	100.0%
ZL	Xcel Energy Labor	3,018,000	2,284,039	$ 733,961	2,284,039	100.0%
ZS	Staff Augmentation Contracts	9,761,000	2,444,279	$ 7,316,721	2,444,279	100.0%
ZZ	Escalation & Contingency	11,368,000	0	$ 11,368,000	0	0.0%
	Totals	**$26,430,000**	**$5,887,260**	**$ 20,542,740**	**$5,887,260**	**100.0%**
	PROJECT TOTAL	**$74,837,000**	**$59,173,558**	**$ 15,663,442**	**$59,173,558**	**100.0%**
	Energy Supply Total for PSCO Share (75.5%)	**$56,501,935**	**$45,146,206**	**$ 11,355,729**	**$45,146,206**	**100.0%**

Xcel Energy

Hayden SCR Unit 2 Summary Cost Estimate

CONTRACT	Description	Baseline Estimate 01-Sep-11	Current Estimate 31-Dec-16	Budget Delta	Spent to-date 31-Dec-16 $	Spent to-date 31-Dec-16 %
Direct Contracts						
AE	Engineering & Service Contracts	5,219,000	3,869,279	$ 1,349,721	3,869,279	100.0%
CC	Construction Contracts	26,711,000	34,450,724	$ (7,739,724)	34,450,724	100.0%
CE	Controls Equipment	0	225,949	$ (225,949)	225,949	100.0%
EE	Electrical Equipment	2,078,000	0	$ 2,078,000	0	0.0%
ME	Mechancial Equipment	24,098,000	23,363,463	$ 734,537	23,363,463	100.0%
	Totals	**$58,106,000**	**$61,909,415**	**$ (3,803,415)**	**$61,909,415**	**100%**
Indirects						
ZA	Misc Site P.O.s	529,000	529,169	$ (169)	529,169	100.0%
ZH	Xcel Energy Costs	2,287,000	355,371	$ 1,931,629	355,371	100.0%
ZL	Xcel Energy Labor	3,081,000	1,584,099	$ 1,496,902	1,584,099	100.0%
ZS	Staff Augmentation Contracts	10,298,000	2,030,907	$ 8,267,093	2,030,907	100.0%
ZZ	Escalation & Contingency	16,219,000	0	$ 16,219,000	0	0.0%
	Totals	**$32,414,000**	**$4,499,545**	**$ 27,914,455**	**$4,499,545**	**100.0%**
	PROJECT TOTAL	**$90,520,000**	**$66,408,959**	**$ 24,111,041**	**$66,408,959**	**100.0%**
	Energy Supply Total for PSCO Share (37.4%)	**$33,854,480**	**$24,968,255**	**$ 8,886,225**	**$24,968,255**	**100.0%**

The question of asset recovery for the stranded assets in the Brush and Hayden coal plants is expensive and complicated and deserves the focus of the Commission in a separate proceeding so that the Commission will have the best chance of determining the fairest way to split the burden of paying off these stranded coal assets.

D. No Resource Is "Firm"—Coal Plants Are Often Off-Line During The Summer Peaks

Coal plants are typically given full capacity credit in assessments of "Loads and Resources" as it is assumed that they will always be available when PSCo's system has its peak demand. It is clearly an erroneous assumption that fossil fuel plants are "firm," as summarized below, and should be corrected in PUC thinking and PSCo's analyses.

Pueblo Unit 3 Has Often Been Off Line During the Summer Peak: The PUC Staff report in proceeding 20I-0437E[51]makes it clear that the Billion Dollar Mistake in Pueblo (i.e. Pueblo Unit 3, the one Xcel calls "Comanche 3") has been off line numerous times

The Brush ("Pawnee") Coal Plant Was Off Line During the 2021 Summer Peak Due to a Coal Pile Fire: For descriptions of the burning coal pile during the peak of the summer heat at the Brush coal plant (the one Xcel calls "Pawnee"), see for example:

https://www.fortmorgantimes.com/2021/07/29/xcel-energy-reports-crews-are-making-good-progress-on-pawnee-power-plant-coal-fire/

[51] For the PUC Staff report on the problems at the Pueblo Unit 3, including the times it was off line during the summer peak see Attachment LEM-7 with Hearing Exhibit 1502 in this 21A-0141E proceeding.

Fossil Fuel Plants Can Not Be Counted on During Peak Demand: As noted in the Answer Testimony of Amanda Groziak (Hearing Exhibit 1503, 21A-0141E), the confidential attachments to CRES 4-11 and CRES 4-12 detail the times that PSCo's coal plants have not been available during the summer (CRES4-11) or winter (CRES4-12) peaks.[52]

E. Commission Can And Should Recognize That Citizens Have Repeatedly Been Right About Coal While PUC And UCA (Formerly OCC) Staff Have Failed To Protect Our State

Just saying—if the Commission would take time to review the public comment hearings in any of the following proceedings—04A-214E, 06S-234EG, 07A-447E, 08S-520E, 09AL-299E. 10M-245E and several of the rate case proceedings over the last decade--they would realize that hundreds of Xcel's customers testified and, time and again, understood that investments in coal would soon become stranded—which of course this 21A-0141E proceeding confirms—while the PUC and OCC (Now UCA) Staff have done nothing to object to what now amounts to close to $2 billion in mistaken expenditures on Xcel's Colorado coal plants in the 21st century. Now, of course, Xcel is now asking that its customers pay off those $2 billion in mistaken capital expenditures (to say nothing of the several billion in fuel and O&M that customers have paid)—and of course to give Xcel (for the most part…) their full level of profit on those expenditures.[53]

In addition to all the testimony at the PUC warning Xcel and the Commission about fossil fuel expenditures becoming stranded—all of which has largely been ignored by previous

[52] Also, CRES 4-13 and CRES 4-14 detail the times that PSCo's gas turbines have not been available during the summer peak (CRES 4-13) and winter peak (CRES4-14).
[53] The details on Xcel's requests for "asset (think stranded asset)" cost recovery in this proceeding are in Xcel witness Scott Watson's testimonies.

Commissions and the PUC Staff, there were warnings in local media. Below is an excerpt from just one of those warnings in the Denver Post in 2015.

> https://www.denverpost.com/2015/02/03/will-coal-investments-become-stranded-assets/
>
> ## Will coal investments become stranded assets?
>
> February 3, 2015
>
> A machine that no rational person wants to build is one that generates stranded assets — assets that become non-functional long before they have been paid for.
>
> Unfortunately, customers of Colorado's largest utility, Xcel, are bound to just such a "stranded asset machine," given the poor decisions that the Public Utilities Commission is allowing Xcel to make. (Rest at link above)

Sadly, the Colorado PUC and its Staff have failed to protect PSCo's ratepayers from hundreds of millions of dollars of undepreciated and now "stranded" coal plants and expenditures that now need to be dealt with as seen so clearly in this proceeding (For details, see PSCo witness Scott Watson's testimonies on what Xcel refers to as "asset recovery," but which of course is really **stranded** asset recovery.)

VII. DISCOUNT RATES ARE KEY TO PRESENT VALUE (e.g. PVRR) CALCULATIONS--IT IS ESSENTIAL TO AT LEAST DO DISCOUNT RATE SENSITIVITY RUNS AT A LOWER RATE IN ORDER TO GIVE A FAIR ASSESSMENT OF RENEWABLE ENERGY SAVINGS

A. It is Indisputable that Present Value Revenue Requirements (PVRR's) Depend Strongly on the Discount Rate that is Used

The discount rate issue has been well briefed by Colorado Renewable Energy Society witness, Laurent Meillon in Hearing Exhibit 1502. Below is a quick version based on the discount rate sensitivity runs that Xcel did (at the PUC's direction in ¶94 of Decision C17-0316) in the last Resource Plan (16A-0396E).

Figure LWG-PHS-15
Excerpt from Appedix E to the 120 Day Report, Xcel's 2016 Electric Resource Plan, 16A-0396E (Page 2)

Portfolio PVRR Delta from Preferred ERP - Replacement Method

Port #	Family	Port Name	Base	Low Gas Price	High Gas Price	GPVM	Low CO2	High CO2	SCC	0% Disc Rate	3% Disc Rate	4B Tail	Accel Depr	Owned Wind Deg
2	ERP 450	LCP	(14)	11	(45)	(18)	(30)	(46)	(75)	(100)	(43)	(3)	(14)	(14)
3	ERP 450	Preferred	-	-	-	-	-	-	-	-	-	-	-	-
4	ERP 450	All Thermal	510	246	876	570	719	958	1,360	1,804	1,009	349	510	510
5	CEP 1110	LCP	(328)	(364)	(279)	(351)	(519)	(740)	(1,040)	(1,884)	(853)	(384)	(218)	(328)
6	CEP 1110	Preferred	(213)	(216)	(211)	(247)	(442)	(708)	(1,078)	(1,398)	(607)	(235)	(103)	(174)
7	CEP 1110	Full Replacement	(196)	(199)	(194)	(229)	(423)	(688)	(1,055)	(1,368)	(584)	(218)	(86)	(157)
8	CEP 1110	MLEP	(65)	(83)	(42)	(91)	(273)	(511)	(841)	(1,067)	(371)	(102)	45	(10)
9	CEP 775	LCP	(293)	(304)	(272)	(325)	(379)	(506)	(664)	(1,595)	(736)	(333)	(239)	(293)
10	CEP 775	500 Owned	(106)	(98)	(111)	(146)	(220)	(382)	(591)	(889)	(361)	(118)	(52)	(67)
11	CEP 775	MLEP	(116)	(146)	(69)	(144)	(188)	(300)	(431)	(911)	(370)	(168)	(62)	(72)

Looking at the results from Xcel's 2016 Resource Plan above and focusing (just for example) on Portfolio #6, the Preferred Portfolio—below are the Present Value Revenue Requirements ("PVRR") at three different discount rates:

Table LWG-PHS-6
PVRR Savings Compared to Portfolio #2 (16A-0396E) as a Function of Discount Rate

Data from Appendix E to PSCo's 120-Day Report in 16A-0396E, Page 2

PVRR Savings Portfolio #6 v #2 – *Xcel's 2016 ERP (16A-0396E)*	**Present Value of the Revenue Requirement (PVRR) Savings**
Base Case (6.78% Discount Rate)	$213 Million
3% Discount Rate	$607 Million
0% Discount Rate	$1,398 Million (i.e. $1.4 Billion)

Using Xcel's own modeling results, it is irrefutable that the results of a PVRR calculation are strongly dependent on the discount rate that is used. When there are fuel free renewable resources in the comparison, a lower discount rate will show greater savings from these fuel-free resources because future fuel costs for the fossil fuel alternative (e.g. coal or natural gas) will not be *discounted* so heavily.

B. The Legislature Now Largely Understands the Importance of Using Lower Discount Rates; It is Past Time that the PUC Caught Up

The Colorado legislature has begun to understand the importance of what discount rate is used in present value calculations. It is past time for the PUC and its Staff to start catching up. Two key sections of the Colorado Revised Statutes (CRS) related to electric utility and gas demand side management are copied below with references to discount rate highlighted in bold and yellow.

> **CRS 40-3.2-106 (4)** The commission shall base the cost of carbon dioxide emissions on the most recent assessment of the social cost of carbon dioxide developed by the federal government using a discount rate of two and one-half percent or less. Starting in 2020, the commission shall use a social cost of carbon dioxide of not less than sixty-eight dollars per short ton. The commission shall modify the cost of carbon dioxide emissions based on escalation rates of the 2020 base cost by an amount that is equal to or greater than the escalation rates established in the technical support document. When calculating the cost of carbon dioxide emissions for any proceeding listed in subsection (1) of this section, the commission shall use a **discount rate** for the social cost of carbon dioxide that does not exceed the lesser of two and one-half percent or any lower value established by the most recent available successor to the technical support document. Notwithstanding the discount rate used to develop the social cost of carbon dioxide value over the planning period, the commission shall continue to discount any net present value analysis of any optimized resource portfolio in the electric resource planning process using discount rates that the commission deems appropriate. (Emphasis added.)

> **CRS 40-3.2-107(2) (a)** The commission shall base the social cost of methane emissions on the most recent assessment of the global social cost of methane developed by the federal government, using a discount rate of two and one-half percent or less as updated to reflect the latest available figures derived from peer-reviewed, published studies; except that, beginning on September 7, 2021, the commission shall use a social cost of methane of not less than one thousand seven hundred fifty-six dollars per short ton. The commission shall modify the social cost of methane emissions based on escalation rates of the 2020 base cost by an amount that is equal to or greater than the escalation rates established in the addendum to the technical support document and shall use a **discount rate** that does not exceed the lesser of two and one-half percent or any lower value established by the most recent available successor to the technical support document.
> **(b)** When calculating the cost of methane emissions for any purpose listed in subsection (1) of this section, the commission shall obtain and apply the best available values for natural gas leakage during the extraction, processing, transportation, and delivery of natural gas by the gas public utility as well as leakage from piping or other equipment on customer premises. The commission shall take into account any relevant data and emissions accounting methodologies developed by the air quality control commission pursuant to section 25-7-140 regarding methane leakage rates and the appropriate global warming potential of methane. The commission shall use

> the same **discount rate** as that used to develop the federal social cost of methane, as set forth in the addendum to the technical support document.
> **(c)** Notwithstanding the discount rate used for the cost of methane emissions, the commission shall discount other future cost streams into the net present value analysis of any resource portfolio in the gas DSM program planning process using a **discount rate** that the commission deems relevant to the parties responsible for financing or paying these future costs. When ratepayers are covering costs without investment from gas public utilities, such as environmental costs or pass-through fuel costs, the commission shall give consideration to discounting those costs with a stable long-term inflation rate that, in the commission's judgment, accurately represents the net present value of future cash flows experienced by ratepayers. (Emphasis added.)

Importantly, the legislature has recognized in CRS 40-3.2-107 (2) (c) that for future costs that ratepayers will be paying (e.g. fuel costs), that the "commission shall give consideration to discounting those costs at the long-term inflation rate…."

While the Commission may be reluctant to order different discount rates for different cost streams, running sensitivity runs at 0% and 3% discount rates (or whatever lower rates the Commission chooses) will give the Commission a clearer view of the long-term savings in fuel (and often O&M) that can come from investments now in fuel-free renewable generation like wind and solar, as definitely demonstrated by Table LWG-PHS-6 above.

C. Using the Social Cost of Carbon is Not a Substitute for Sensitivity Runs at Lower Discount Rates

During the hearing in this 21A-0141E, Chairman Blank seemed to wonder if using the Social Cost of Carbon could, in a sense, substitute for lowering the discount rate to one that more closely reflects inflation. The short answer is no…

It is a bit like the proverbial butcher with a thumb on the scales, but this butcher has three thumbs on the scale and asks if it wouldn't be sufficient to take just one thumb off the scale. The answer is clearly, "No." An accurate measurement includes taking all of the "thumbs" off the

"scale"[54] that have not given an accurate picture of the true long-term costs of fossil fuel expenditures.

To get an accurate reading on social costs and a useful PVRR, it is important that the PUC do <u>all</u> of the following:

1) Use the Social Cost of Carbon (See CRS 40-3.2-106 (1) (a)

2) Use the Social Cost of Methane (See CRS 40-3.2-106 (1)(a)

3) Perform Discount rate sensitivity runs as was done in 16A-0396E

Of course even the three things above don't give us a full measure of the cost of reliance on coal either because we should be considering the Social Cost of Mercury and the Social Cost of Lead and the Social Cost of Arsenic and the Social Cost of Chromium and the Social Cost of Particulates and the Social Cost of SOx and NOx (oxides of sulfur and nitrogen, contributors to acid rain) and the Social Cost of Acid Gases (like HCl and HF and H_2SO_4 mist) and the Social Cost of Coal Ash and the Social Cost of Coal Mining etc. etc. etc.[55]—but at least if we start with the three measures above, we'll start to get a better measure of the social cost of the decisions made by the PUC.

[54] The "thumb on the scale" analogy isn't the best because really what we are trying to do is to "weigh" the full cost of fossil fuels—something we've been failing to do for a VERY LONG time, but you get the idea—we need to do all three things—Social Cost of Carbon, Social Cost of Methane and a Lower Discount Rate—to get an accurate measure of the true cost of fossil fuels—and of course this isn't adequate either because we should be considering all of the social costs of coal and fossil methane, but doing these three basic things will give us a good start.

[55] Renewable generation resources like wind and solar also have external environmental and social costs, but they are, in virtually all situations, less than the social costs of fossil fuels—but it is good to remember that no generation is without its social costs which argues for optimizing building design, energy efficiency and demand management options which are likely to have the lowest environmental and social costs.

D. Discount Rate Sensitivities are Quick and Easy to Do

Importantly, doing discount rate sensitivities is not difficult. Typically there is a cell or a box in a spreadsheet or modeling program and you put the number in there—e.g. 6.53% or 3% or whatever, and within seconds the result is delivered, so doing discount rate sensitivities is not time consuming for Xcel and the results, like the ones from 2016, can help inform the Commission's decisions in Phase II of this Resource Plan.

E. Using Discount Rate Sensitivities Will Help the Commission Comply with Rule 3601 by Finding PVRRs that Are Closer to the Minimum

Recognizing that a lower discount rate will almost certainly reflect greater savings from renewable resources is important because PUC Rule 3601 (copied below) states that a primary goal of resource planning is to minimize the Present Value Revenue Requirement ("PVRR"). A lower discount rate will better reflect the future savings from fossil fuel costs and will help the PUC find portfolios that will truly *minimize* the PVRR. Higher savings likely mean that there is more "head room" for adding more renewable energy to the system (up to any true reliability limit) which will lead to greater fuel cost savings in the future and a better compliance with the Rule 3601 goal of minimizing the PVRR.

Colorado PUC Rules for Electric Utilities, 4 CCR 723-3, Rule 3601

3601. Overview and Purpose.

The purpose of these rules is to establish a process to determine the need for additional electric resources by electric utilities subject to the Commission's jurisdiction and to develop cost-effective resource portfolios to meet such need reliably. It is the policy of the state of Colorado that a primary goal of electric utility resource planning is to minimize the net present value of revenue requirements. It is also the policy of the state of Colorado that the Commission gives the fullest possible consideration to the cost-effective implementation of new clean energy and energy-efficient technologies.

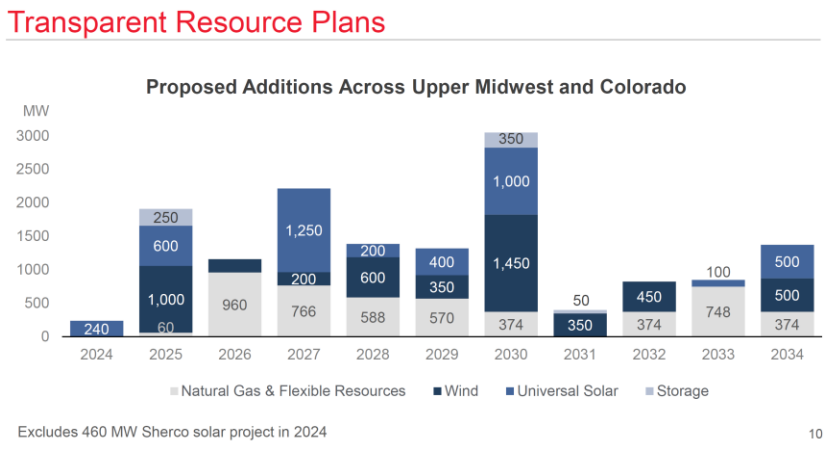
VIII. AVOID OVER-INVESTING IN GAS PLANTS—GAS PLANTS ARE LIKELY TO BECOME STRANDED AND THERE ARE MANY CHEAPER, CLEANER OPTIONS

Other parties will brief the need to avoid stranded investments in gas plants (even if they are "hydrogen capable." Ms. Glustrom just wants to highlight some key facts and concepts.

A. Be Wary—Very Wary of Xcel's Desires to Spend Money on Gas and Hydrogen Infrastructure

The slides from Xcel below in Figures LWG-PHS-16 and LWG-PHS-17 make it clear that part of Xcel's plan is to continue to invest in gas resources well into the 2030s and to spend heavily on hydrogen—even though there is good reason to believe that there are much cleaner and lower cost options available. As discussed further below**, the Commission should be wary, very wary of Xcel's plans to sink large amounts of capital into gas resources that are likely to become stranded** long before they reach the end of their projected useful lives—just as has happened with Xcel's large expenditures on coal plants (new and old) in Colorado—and which Xcel now assumes its ratepayers will pay off!

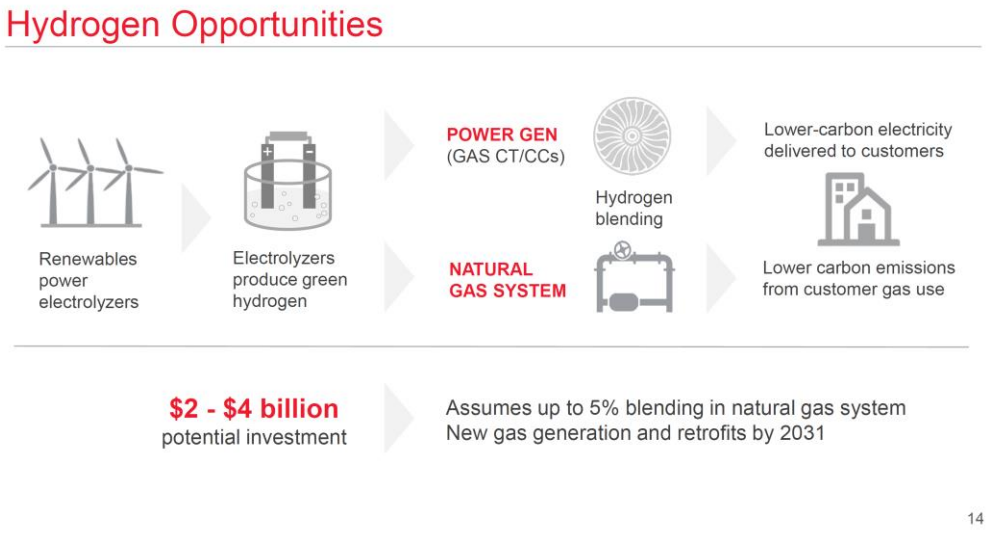
Figure LWG-PHS-16
Xcel's Plans for Gas Expenditures Into the 2030s
From LWG-1, Xcel PPT to Evercore ISI Conference January 2022, Slide 10[56]



[56] Xcel PPT attached as LWG-1, available from https://investors.xcelenergy.com/news-market-information/presentations/default.aspx

Figure LWG-PHS-17
Xcel's Plans to Spend $2-4 Billion on Hydrogen—For Only a 5% Blend!

From LWG-1, Xcel PPT to Evercore ISI, January 2022, Slide 14[57]



In Figure LWG-PHS-17, above you can see that Xcel is projecting a $2-4 billion expenditure on hydrogen for "up to 5% blending" in the natural gas system. This seems to be a classic case of Xcel finding a place to "dump their capital" in order to expand the rate base and drive up rates since a 5% blend is going to be very expensive but do almost nothing to reduce emissions of carbon dioxide or methane.

Xcel wants to spend $2-4 billion on hydrogen related investments for "up to 5%" blending in the natural gas system which, as seen in LWG-PHS-18 will have virtually no impact on carbon emissions!!
It will, of course, inflate Xcel's rate base and serve as a rationale for yet further rate increases.

[57] Xcel PPT attached as LWG-1, available from https://investors.xcelenergy.com/news-market-information/presentations/default.aspx

Be Wary, Very Wary

of Xcel's Efforts to Use Hydrogen to Continue Reliance on Gas Combustion!!

Figure LWG-PHS-18
Relationship Between % Hydrogen and Carbon Reduction
From ARG-11, Hearing Exhibit 1503, page 5, 21A-0141E

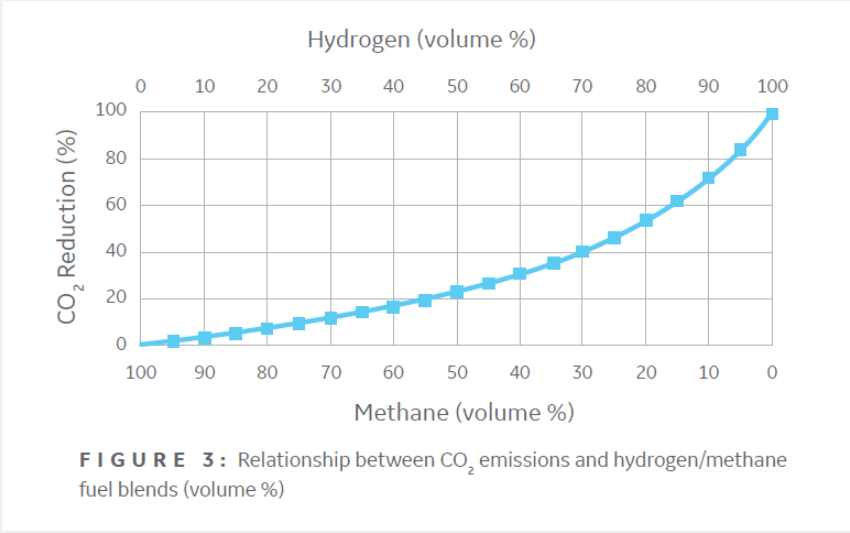


FIGURE 3: Relationship between CO_2 emissions and hydrogen/methane fuel blends (volume %)

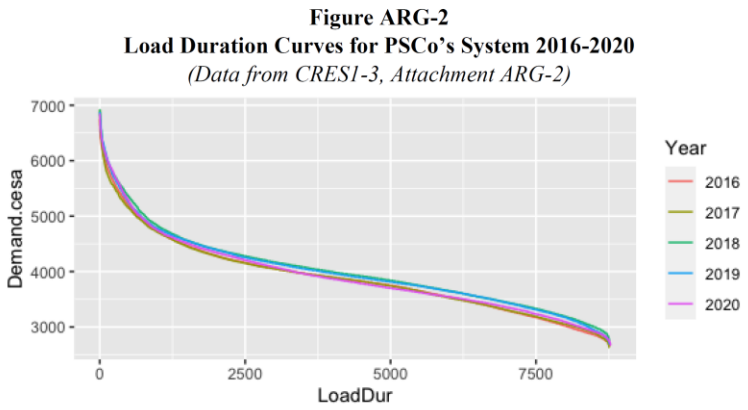
From Figure LWG-PHS-18 above, it can be seen that even a 30% blend of hydrogen will lead to something significantly less than a 20% reduction in carbon dioxide emissions; a 5% blend of hydrogen—while likely to be extremely expensive—will have virtually no impact on carbon dioxide emissions and of course the associated natural gas will be leaking and driving the warming of the planet[58] through all of this.

[58] The GWP (Global Warming Potential) of methane (aka "natural" gas) is over 80 times more powerful than carbon dioxide on a 20 year basis according to the most recent assessments of the GWP of methane. See Hearing Exhibit 1500 and attachments or https://www.epa.gov/ghgemissions/understanding-global-warming-potentials or https://en.wikipedia.org/wiki/Global_warming_potential

B. Don't Acquire Gas Turbines to Meet the Demand of a Few Hours a Year—Use Alternative Ways to "Shave," Manage or Meet the Peak

Xcel presents its "load" in the the "Loads and Resources" table as the peak load. This only occurs, by definition, one[59] hour of the year. The Load Duration Curves for PSCo for the five year period of 2016-2020 are in Figure LWG-PHS-19 below taken from Hearing Exhibit 1503, the Answer Testimony of CRES witness Amanda Groziak.

Figure LWG-PHS-19
PSCo's Load Duration Curves 2016-2022[60]
From Hearing Exhibit 1503, Data from ARG-2, PSCo's 8760 Data for 2016-2020



As seen in Figure LWG-PHS-19 above it can be seen how sharp the peak is in PSCo's Colorado load. Further details are provided in the Answer Testimony of CRES witness Amanda Groziak. The key is that the peak demand on PSCo's system is only experienced for a few hours of the year and this can almost certainly be "shaved" with batteries[61] and stronger attention to demand response and demand management programs.

[59] It is possible that there could be more than one hour of the year with exactly the same peak load, but this is unlikely and even then it would be at most a few hours of the year experiencing Xcel's peak load.
[60] The x-axis ("Load Dur") is the number of hours of the year that the load on the y-axis is experienced.
[61] Many other parties have briefed the importance of giving proper capacity credit or "ELCC" (Effective Load Carrying Capacity) to batteries and storage—including all of their grid services as contributed through modern technology and management. One place to start are the testimonies of Interwest witness Michael Goggin, Hearing Exhibits 1300 and 1302, 21A-0141E.

PSCo's ratepayers should not be asked to pay for hundreds of MW of peaking gas combustion turbines that will sit idle over 99% of the time only to be turned on for a few hours to meet PSCo's very sharp peak.

Peak demand on PSCo's system is only experienced for a few hours of the year and this can almost certainly be "shaved" at a much lower cost with batteries and stronger attention to demand response and demand management programs than PSCo is proposing.

PSCo's ratepayers should NOT be asked to pay for hundreds of MW of peaking gas combustion turbines that will sit idle over 99% of the time only to be turned on for a few hours to meet PSCo's very sharp peak.

The extremely low capacity factors for many of PSCo's gas turbines are shown below in the excerpt from "AKJ-2", Volume II of PSCo's proposed Resource Plan, in this 21A-0141E hearing.

Figure LWG-PHS-20
Capacity Factors for PSCo's Gas Turbines
From page 125, AKJ-2, Volume II of PSCo' Proposed Resource Plan (21A-0141E)

GAS COMBUSTION TURBINE UNITS										
Alamosa 1	0.28%	0.25%	0.04%	0.14%	0.03%	0.01%				
Alamosa 2	0.32%	0.24%	0.04%	0.17%	0.03%	0.03%				
Blue Spruce 1	0.40%	0.30%	0.28%	0.72%	0.39%	0.69%	0.30%	0.10%	0.02%	0.13%
Blue Spruce 2	1.03%	0.58%	0.78%	1.18%	0.69%	1.56%	0.55%	0.13%	0.03%	0.18%
Fruita 1	0.05%	0.02%	0.02%	0.03%	0.04%	0.02%				
Ft. Lupton 1	0.00%	0.18%	0.00%	0.00%	0.01%	0.00%				
Ft. Lupton 2	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%				
Ft. St. Vrain 5	0.54%	0.46%	0.41%	0.62%	0.39%	1.22%	0.58%	0.12%	0.05%	0.21%
Ft. St. Vrain 6	0.26%	0.20%	0.30%	0.31%	0.29%	0.88%	0.42%	0.11%	0.05%	0.19%
Manchief 11	0.26%	0.10%	0.09%	0.11%	0.12%	0.05%	0.08%	0.03%	0.02%	0.02%
Manchief 12	0.26%	0.10%	0.09%	0.11%	0.12%	0.05%	0.08%	0.03%	0.02%	0.02%
Valmont 6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
Valmont 7	0.01%	0.00%	0.02%	0.03%	0.03%	0.04%	0.04%	0.19%	0.41%	0.48%
Valmont 8	0.01%	0.00%	0.02%	0.03%	0.03%	0.04%	0.04%	0.19%	0.41%	0.48%
Cherokee 4	2.25%	0.00%	0.45%	0.61%	0.00%	0.24%	0.60%			

From Figure LWG-PHS-20, above, it is clear that most of PSCo's gas turbines are used less than 0.5% of the time.

That means these gas turbines are sitting idle for 99.5% of the year.

There are almost certainly lower-cost, cleaner ways to "shave" and manage the peak than having hundreds of MW of gas turbines sitting idle for 99.5% of the year!!

C. No Resource is Truly "Firm"

No resource is truly "firm" and Xcel's efforts to label gas turbines as "firm" should be recognized as an attempt to justify further expenditures on fossil fuel/gas generation and infrastructure.

As noted in the Answer Testimony of Amanda Groziak (Hearing Exhibit 1503, 21A-0141E), CRES 4-13 and CRES 4-14 detail the times that PSCo's gas turbines have not been available during the summer peak (CRES 4-13) and winter peak (CRES4-14). Also the confidential attachments to CRES 4-11 and CRES 4-12 detail the times that PSCo's coal plants have not been available during the summer (CRES4-11) or winter (CRES4-12) peaks.

D. Please, Please Move Toward Integrated Planning—The Current System Is Almost Certainly Not Leading to Optimal Solutions

The current system of doing renewable energy and demand side planning separately grew out of the time when these resources were small "side lights" to the planning for a fossil fuel dominated system.

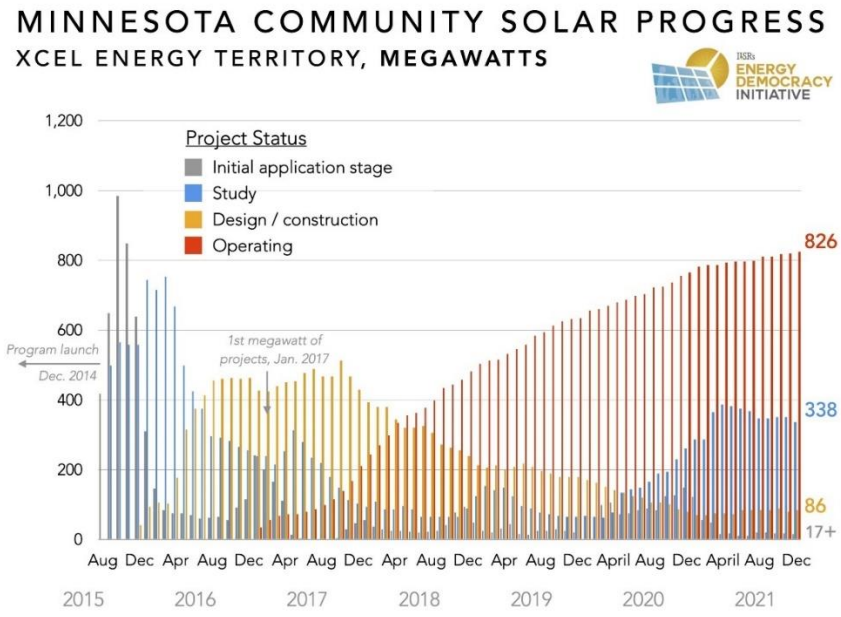
Now of course, these programs are central to managing an electric system dominated by renewable generation, storage and modern demand response/management techniques.

To ensure optimal solutions for utility customers and to help minimize the Present Value Revenue Requirement ("PVRR") as called for by PUC rule 3601, the Commission should do everything possible to bring plans for renewable generation and demand management under "one roof" and do much more integrated plans.

An important aspect of improving resource planning for Xcel at the Colorado PUC is to take a hard look at the limits that Xcel is putting on Solar Gardens in their territory. The "sunny" state of Minnesota has over 800 MW of solar gardens as of mid-2021, PSCo had about 83 MW of solar gardens in 2020.[62] Figure LWG-PHS-21 below indicates PSCo expects to have about 118 MW in 2021.

Below is a graph of Minnesota's Community Solar Program showing the rapid growth to over 800 MW.

Figure LWG-PHS-21
Minnesota's Xcel Community Solar Garden Progress
From https://ilsr.org/minnesotas-community-solar-program/ (Accessed Jan 20, 2022)



[62] For an assessment of PSCo's solar gardens, you can either reference the most recent renewable energy proceeding or an expanded Loads and Resources table. In this 21A-0141E proceeding an expanded Loads and Resources table was provided by PSCo in response to CRES discovery 3-1 which is included with Hearing Exhibit 1503 as ARG-3. It shows nameplate capacity of PSCo solar gardens at 82.79 MW in 2020.

In comparison, Xcel in Colorado does not even plan to have 800 MW of Community Solar Gardens in 2030 as seen in Figure LWG-PHS-21 below.

Figure LWG-PHS-21
Excerpt from Colorado PUC Staff Report on Distributed Resource Interconnection

Proceeding 21I-0321E, PUC Staff Report December 29, 2021, Excerpt from Page 25

The major IOU in Colorado, PSCo, plans to increase interconnected solar capacity each year based on the Table B-15, shown below, from Attachment AKJ-3 in the Energy Resource Plan (ERP) Proceeding No. 21A-0141E.

Table B-15

Distributed Solar (Nameplate MW)			
Year	Behind the Meter	Community Gardens	Total
2021	496	118	614
2022	561	185	747
2023	629	252	882
2024	686	319	1,005
2025	726	385	1,111
2026	769	451	1,220
2027	815	516	1,331
2028	872	582	1,454
2029	950	646	1,596
2030	1,046	711	1,757

If "sunny" Minnesota can have over 800 MW of solar gardens, then certainly Colorado can move faster at providing this important solar option for customers that can't put solar on their own property.

E. Recognize that Resource Adequacy is Only One Component of Electric System Reliability; As Extreme Weather Intensifies, System Reliability Will Likely Be Much More Threatened by Transmission and Distribution Issues Than by Generation Adequacy

A large part of Electric Resource Planning is focused on reliability, but the process focuses on generation adequacy—not on what happens when the transmission system or distribution system go down

taking out the power. [63]This is becoming an increasingly serious issue as storms and other extreme weather events intensify. [64]

Here are examples of just a few of the many outages in the United States in recent months:

www.wcvb.com › article › massachusetts-power**Massachusetts power companies warn nor'easter outages could ...**

2 hours ago · "We're already securing external crews, so they are in place and ready to go as soon as it's safe to get back out there and start turning the power back on," Eversource spokesperson…

losangeles.cbslocal.com › 2022/01/22 › strong-winds**Strong Winds Cause Power Outages Across SoCal, Over 70,000 ...**

Jan 23, 2022 · LOS ANGELES (CBSLA) — Over 70,000 Southern California residents have been impacted by the high-powered winds moving through the region on Saturday, as a number of power

www.boston.com › news › local-news**Map: More than 150,000 in Massachusetts still without power ...**

Oct 27, 2021 · updated on October 29, 2021 More than 150,000 customers on the South Shore and Cape Cod are still without power on Friday, days after a powerful autumn nor'easter walloped…

www.cnn.com › 2021/08/31 › weather**Ida left more than 1 million without power, possibly for ...**

Sep 01, 2021 · The power grid did not. Millions of Gulf Coast residents who survived Ida's devastating winds and deluge of rain face a new danger -- widespread power outages that are…

[63] A thoughtful discussion of grid reliability issues in the 21st century can be found at https://e360.yale.edu/features/three-myths-about-renewable-energy-and-the-grid-debunked
[64] Power outages can be tracked in real time on this website https://poweroutage.us/

And here are just a few of the outage reports for Colorado in recent weeks

www.denverpost.com › 2022/01/25 › denver-aurora

Nearly 6,000 without power on edge of Aurora, Denver

1 day ago · The outage was first reported at 7:27 a.m. and lasted a little over an hour. There were still 2,681 without power near Smoky Hill Road and Parker Road for a while later but their power…

www.dailycamera.com › 2022/01/22 › xcel-energy-said

Xcel Energy said power restored Friday to Boulder customers ...

Jan 23, 2022 · An Xcel Energy outage Friday left about 6,000 Boulder residents without power for about an hour and a half. Matt Lindstrom, Xcel Energy spokesperson, said in an email Saturday…

www.denverpost.com › 2021/12/31 › marshall-fire

Xcel working to restore power and heat cut by high wind ...

Dec 31, 2021 · Xcel Energy Colorado said about 5,500 customers in the Boulder area were still without electric service Friday evening as a result of the catastrophic wind storm and fire in Boulder…

denver.cbslocal.com › 2021/12/30 › xcel-outages

Xcel Energy Will Start Rolling Electric Outages In Several ...

Dec 30, 2021 · (CBS4) – Xcel Energy is instituting rolling outages for several Colorado counties overnight, in an attempt to keep their statewide system up and running. (credit: CBS) The Marshall…

www.dailycamera.com › 2021/12/30 › about-7000

About 7,000 without power in south Boulder *(Note this is before the Marshall fire started)*

Dec 30, 2021 · December 30, 2021 at 8:58 a.m. Power outages in south Boulder have left about 7,000 customers without power, according to Xcel Energy's outage site. The two main outages are…

The Colorado PUC spends a lot of time planning and discussing reliability and generation resource adequacy and yet most of the power outages experienced by utility customers have to do with vulnerabilities in the transmission and distribution systems.

It seems it is past time to consider reliability much more broadly and take into account the very likely increase in extreme weather events in this century as the planet warms and climate chaos begins to affect ever more people that will lose their power due to transmission and distribution—not generation—issues.

F. Recognize that Current Modeling May Undervalue the Benefits of Flexibility and the Benefits of Battery Storage

Many parties have briefed the argument that PSCo is undervaluing batteries and giving them an Effective Load Carrying Capacity ("ELCC") that is too low.[65] Last fall the National Regulatory Research Institute issued a paper[66] that also underscored this tendency of legacy models to favor legacy (i.e. fossil fuel) resources. The paper is attached as LWG-10. Below are a few excerpts from the press release:

> **Excerpts from https://www.naruc.org/about-naruc/press-releases/resource-choice-and-planning-models-offer-new-options-in-nrri-insights-paper/**
>
> The *Insights* paper, "Making the Right Resource Choice Requires Making the Right Model Choice," argues that today's older generations of resource planning models do not capture the emerging dynamics of a power grid supplied primarily by renewable energy. This limitation leads to imprudent investments in assets that will become functionally useless and ultimately disallowed.
>
> Authors Gary W. Dorris, PhD, and David Millar recognize that because of the emphasis on decarbonization and the dramatic decline in the cost of renewable and storage technologies**, planners must model more complex and uncertain portfolio options.** Their paper provides a new

[65] As one example, see the testimonies of Interwest witness Michael Goggin, Hearing Exhibits 1300 and 1302
[66] See https://www.naruc.org/about-naruc/press-releases/resource-choice-and-planning-models-offer-new-options-in-nrri-insights-paper/

terminology to classify the ability of a planning resource model to capture the new market dynamics, high-definition production cost models versus traditional production cost models. (Emphasis added)

The authors note that as we move into a era of more dynamic electric markets, more complex models (what they call High Definition Production Cost Models or HD PCMs) will allow the model to better recognize the value of flexibility and the ability of new technologies like batteries to profit from rapid up and down movements in the price of electricity.

Comparing HD PCM models that can better capture the benefits of flexible resources to older generation Production Cost Models, the authors found that the rank order of fossil fuel resources and batteries is largely inverted as shown below in Figure LWG-PHS-23.

Figure LWG-PHS-23
Effect of "High Definition" Production Cost Modeling that Better Captures the Benefits of Flexibility on the Ordering of Various Technologies
From LWG-10, Available from
https://www.naruc.org/about-naruc/press-releases/resource-choice-and-planning-models-offer-new-options-in-nrri-insights-paper/

Table 2. Differences in Model Valuations between Traditional and High-Definition Production Cost Modeling

Technology	PCM Deterministic Valuation		HD PCM with Stochastic, Sub-Hourly, and Imperfect Foresight Valuation		Percent Change in Least-Cost Rank Value from PCM to HDCM
	Net Present Value Cost	Rank	Net Present Value Cost	New Rank	
Combined Cycle	$3,760	1	$3,748	5	0%
Frame Gas Turbine	$3,784	2	$3,757	6	-1%
Aeroderivative	$3,807	3	$3,632	4	-5%
Battery Solar Hybrid	$3,820	4	$3,516	2	-8%
Internal Combustion Engine	$3,825	5	$3,629	3	-5%
Stand-alone Battery	$3,836	6	$3,326	1	-13%

It can be seen from Figure LWG-PHS-23 above that models that capture more of the benefits of flexibility (i.e. HD PCM models) rank batteries and battery-solar hybrids as #1 and #2 respectively whereas standard ("Deterministic") Production Cost Modeling ("PCM") ranks

batteries #6 and solar and storage hybrids #4—an indication that standard PCM techniques are not capturing all the benefits of storage and solar plus storage options.

Once again, this is another indication that the Commission should be very careful about over-investing in gas turbine technology when electric system reliability and ratepayer cost are likely to be better served not by these legacy fossil fuel technologies, but rather by batteries and emerging 21st century technologies.[67]

IX. SUMMARY OF RECOMMENDATIONS

GENERAL AND DISCOUNT RATE

1) Reject the Settlement Agreement—it is inadequate. Colorado deserves much better

2) Require discount rate sensitivity runs done at least two lower discount rates (e.g. 3% and 0%) as was done in PSCo's 2016 Electric Resource Plan. (Discount rate sensitivities are quick and easy to do.)

3) Recognize that the Commission is mandated to recognize the Social Cost of Methane in Electric Resource Planning by C.R.S. §40-3.2-106 (1) (a). All the current filings in this 21A-0141E proceeding are implicitly assuming that the Social Cost of Methane is $0/ton; that is clearly not correct. The Commission should mandate the inclusion of a reasonable Social Cost of Methane in Phase II.

4) Ensure that Xcel offers Phase II portfolios that truly *minimize* (not just reduce) PVRR (Present Value of the Revenue Requirement) as required by PUC Rule 3601 and require this *minimization* demonstration to be determined for at least one discount rate of 3% or lower. (Generally Xcel offers a variety of portfolios, but never demonstrates where the *minimum* PVRR is—there is good reason to believe that adding more renewable resources and adding them earlier will lower the PVRR—especially when future fuel costs are not discounted so heavily.

[67] Similar findings about the value of battery storage and battery-solar hybrids is found in the National Renewable Energy Lab Storage Future Study findings. See for example https://www.nrel.gov/news/program/2021/grid-scale-storage-us-storage-capacity-could-grow-five-fold-by-2050.html For a fun video on the "Power Couple" of solar plus storage, see https://www.youtube.com/watch?v=FuFp4LxXK1g

COAL

5) Recognize that C.R.S. § 40-3-101(2), mandates that the Commission to ensure that utility facilities promote the public health and safety of the public. Burning coal at this stage certainly does **not** do that.

6) Phase out Xcel's Colorado coal plants as quickly as possible. It is unconscionable to be burning—and profiting!!—from coal at this stage of the climate crisis.

7) Postpone actual coal plant retirement date decisions but signal that PSCo should be largely beyond coal by 2025. Capacity factors on coal plants should be rapidly reduced to something under 30% by 2025, with an option for PSCo to report to the Commission why it needed to have a higher than 30% capacity factor in 2025.

8) Recognize that burning coal has MANY social costs (i.e. costs borne by society that don't show up on the electric bill) including the social costs of

a) Mercury, arsenic, lead, chromium and other heavy metals,
b) Particulates
c) SOx and NOx (Oxides of sulfur and nitrogen that contribute to ecosystem acidification)
d) Acid Gases like HCl, HF and Sulfuric Acid Mist
e) Coal Mining
f) Coal Ash

9) Postpone any decisions on "asset" recovery in this Resource Planning proceeding. Cost recovery is very complex and has the potential to cause very serious intergenerational inequities (i.e. making future generations pay off our mistakes) and should be dealt with in a separate proceeding. For Phase II modeling, PSCo can use a "placeholder" assumption for asset recovery so all the PVRRs are affected equally.

10) Determine who pays for transition costs (e.g. property taxes and worker training etc) in a separate proceeding. Xcel got these communities (especially Pueblo) into this situation. With $588 million in after-tax net income in Colorado in 2020, PSCo can afford to absorb a lot of the transition costs since they have also earned hundreds of millions of dollars in "return on" just the Pueblo Unit 3 plant alone. **It is an abuse of ratepayers to privatize the profits and socialize the risks—something that should be corrected in accordance with C.R.S. §40-3-102**

11) Require PSCo to report twice yearly on operations, outages, capital expenditures and fuel costs at Pueblo Unit 3 and the Brush and Hayden coal plants so the Commission can monitor operational issues and to carefully track capital expenditures and coal supply issues in this decade

12) Make it clear to Xcel that **capital expenditures on coal plants from this point forward carry a presumption of *imprudence***—not a presumption of prudence

13) Require Staff to prepare a detailed analysis of the US coal industry, consulting with more thoughtful analysts (like those at the Institute for Energy Economics and Financial Analysis known as "IEEFA") so that the PUC can track the economic status of the US coal industry through this decade.

14) Include the replacement resources for Pueblo Unit 3 in the standard bidding process for the 2025 resource plan. Do not hold a separate process and do not establish designated amounts of replacement resources that will have PSCo ownership. Xcel can learn to compete—but they are not welcome to continue to abuse our state and their ratepayers with their monopoly thinking and practices.

GAS

15) Avoid overinvesting in gas turbines as they are likely to be used less than 1% of the year and become stranded assets as solar, storage and demand response/management techniques evolve in the coming decade.

16) Direct PSCo to prepare model runs that avoid gas acquisitions in this Resource Acquisition Period but postpone any decisions on gas purchases to 2025 or later

17) Direct PSCo to move gas Power Purchase Agreements to 5 years or less

18) Do not be fooled by Xcel's claims about moving to hydrogen—it is highly unlikely to be cost effective, there isn't a record to support it as a viable option and there is a record that indicates that **hydrogen blending will NOT lead to significant carbon reductions**.

19) Make it clear that if a new gas resource becomes stranded then any undepreciated asset will be responsibility of PSCo—no regulatory asset, no securitization, no accelerated depreciation—nada…

FUTURE RESOURCE PLANS AND RELIABILITY EFFORTS

20) Provide strong assumptions on DERs, DR, V2G etc for Phase II modeling and also begin the process of consolidating (or timing) these proceedings so **the next ERP will become a true INTEGRATED Resource Plan;** renewable generation, efficiency and demand response/flexibility measures are no longer sidelights, they are quickly becoming integral to the modern electrical grid—they should be treated in line with their central importance.

21) Ensure that best possible practices are implemented before the next resource plan to ensure that peaks are managed and "shaved" so we don't need to acquire gas turbines that will sit idle over 99% of the time to meet the peak.

22) Direct Staff to meet with PSCo to analyze the potential for more advanced modeling (like the High Definition Production Cost Modeling discussed in the NRRI paper in LWG-10) to better reflect all the values of battery storage and solar and storage hybrid resources

23) Require analyses of transmission capacity to include capacity opened up by the retirement of coal or other fossil fuel plants. (This does not appear to have been done in the companion transmission proceeding 21A-0096E).

24) Recognize that resource adequacy is only a small part of providing reliable electrical power and that **many outages are the result of vulnerabilities in the distribution and transmission system—not the lack of generation capacity**—and adjust Electric Resource Planning and other PUC work accordingly. PSCo has many outages a year that affect thousands of customers and this is likely to intensify in the coming years and decades unless efforts are made to develop an electrical system (including a more distributed and "resilient" framework) that is less vulnerable to extreme weather, because **we "ain't seen nothing yet" on the extreme weather front…sadly…ever so sadly….**

https://www.bouldercounty.org/disasters/wildfires/marshall/#1641425036577-28a45d25-cf8c

One last time—even thinking about burning coal at this stage of the climate crisis is unconscionable.

Asking to **profit** from burning coal for a single more day is

WAY BEYOND UNCONSCIONABLE!!

Submitted, this 28th day of January 2022

/s/ Leslie Glustrom

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