Coal Resource Study for the Colorado Public Utilities Commission

For

Public Service Company of Colorado

March 2021

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Exhibit – BLM, Federal Coal Lease Status Map

Definitions/Abbreviations

Annual Energy Outlook: AEO - The AEO is published pursuant to the Department of Energy Organization Act of 1977, which requires the U.S. Energy Information Administration Administrator to prepare annual reports on trends and projections for energy use and supply.

Bureau of Land Management: BLM

Earnings Before Interest, Taxes, Depreciation and Amortization: EBITDA - A financial term used in calculating a company's financial performance; it is sometimes referred to as operating cash flow.

Environmental Impact Statement: EIS

Hydraulic Fracturing or Fracking: An oil and gas well development process that typically involves injecting water, sand, and chemicals under high pressure into a bedrock formation via a well. This process is intended to create new fractures in the rock as well as increase the size, extent, and connectivity of existing fractures. Hydraulic fracturing is a well-stimulation technique used commonly in low-permeability rocks like tight sandstone, shale, and some coal beds to increase oil and/or gas flow to a well from petroleum-bearing rock formations.

Labor Productivity or Productivity: TPMH - Tons Per Man Hour.

Lease-by-Application: LBA - The BLM established the LBA process where companies can nominate reserve blocks for leasing in a competitive bid process. This process has resulted in 27 tracts, containing an estimated 7.9 billion tons of coal, being leased since 1991.

Mega Watts: MW

Metallurgical Coal: Metallurgical coal or coking coal is used in the process of creating coke necessary for iron and steel-making.

Million Tons: MT

Million Tons Per Year: MTY

Mining Ratio or Ratio: BCYT - Measured in Bank Cubic Yards per Ton is the number of yards of overburden moved per ton of coal mined.

Powder River Basin: PRB

Public Service of Colorado: PSCo

Thermal Coal: Thermal coal, also known as steam coal, is used for power and heat generation.

US: United States

US Energy Information Administration: EIA

US Geologic Survey: USGS

Introduction

The Colorado Public Utilities Commission (CPUC) ordered Public Service Company of Colorado (PSCo) to provide an assessment of the status of its coal supply and coal suppliers. This report is prepared in response to this order. Specifically, paragraph 156 of CPUC Decision No. C17-0316 states as follows:

> 156. Given the turbulence in the coal market, we find it necessary for Public Service to provide the Commission an assessment of the status of its coal supply and coal suppliers. We therefore direct the Company to provide two reports: the first to be filed on or before October 31, 2018, and the second to be filed at the time when it files its 2019 ERP. Each report shall provide a market-based assessment of Public Service's suppliers along with the coal production industry in general. Public Service is not required to determine the future cost structures and profitability of individual suppliers or mines. Instead, the Company may use commercially available resources and professional services that provide assessments of the financial health and future viability of the coal industry as relevant to Public Service. Each report shall also include a detailed discussion of the factors which affect the future coal cost and supply.

In accordance with the CPUC's order, PSCo filed the first report on October 31, 2018. This second report prepared for PSCo will be filed with PSCo's 2021 Electric Resource Plan (ERP), as the 2019 ERP referenced in the Decision is now the 2021 ERP.

Executive Summary

Public Service Company of Colorado generates electricity at eight coal fired units at four power plants (Comanche, Pawnee, Hayden and Craig). Most of this coal comes from the Powder River Basin (PRB) in Wyoming and the balance from mines in northwestern Colorado. The PRB is the largest coal producing region in the United States (US) with 12 surface mines that produced 210.0 million tons (MT) in 2020.

In 2020, the Comanche and Pawnee collectively received 4.6 MT of coal from four PRB coal mines: Black Thunder, Belle Ayr, Buckskin and Eagle Butte. (Deliveries to the Comanche plant were curtailed by outages caused by issues with the turbine and generator in Unit 3 in 2020.) According to PSCo's February 2021 Clean Energy Plan announcement,[1] Pawnee is scheduled to be converted to natural gas by 2028 and Comanche's Unit 3 is scheduled to be retired in 2040 but with a significant reduction in operating hours after 2030. The most likely alternate sources for this coal are the NARM, Antelope, Caballo and Cordero Rojo mines.

Based on expected production levels, these mines generally have 11 to over 20 years of reserves in their current coal leases and up to another 20 years in adjacent defined lease areas not yet under control. Mining companies generally avoid acquiring additional reserves sooner than necessary, due to the high lease bonuses required to lease the reserves. Beyond the specific reserves identified in this analysis, there are additional reserves in the PRB, as identified in the USGS *Coal Geology and Assessment of Coal Resources and Reserves in the Gillette Coal Field, Powder River Basin, Wyoming* published in 2015, that can extend coal production in the PRB by more than 80 years. Because of plant retirements and other factors, coal demand has been decreasing and the PRB mines generally have more production capacity than recent production levels.

The railroads serving the PRB have made significant investments in the rail transportation infrastructure and have sufficient capacity to meet expected demand.

Five PRB coal producers (Arch, Alpha, Peabody, Blackjewel and Cloud Peak) have gone through bankruptcy since 2015. Two of these companies have emerged from bankruptcy and three companies have been sold. With one exception, all the mines involved in these bankruptcies continued to operate

[1] Our Energy Future (xcelenergy.com)

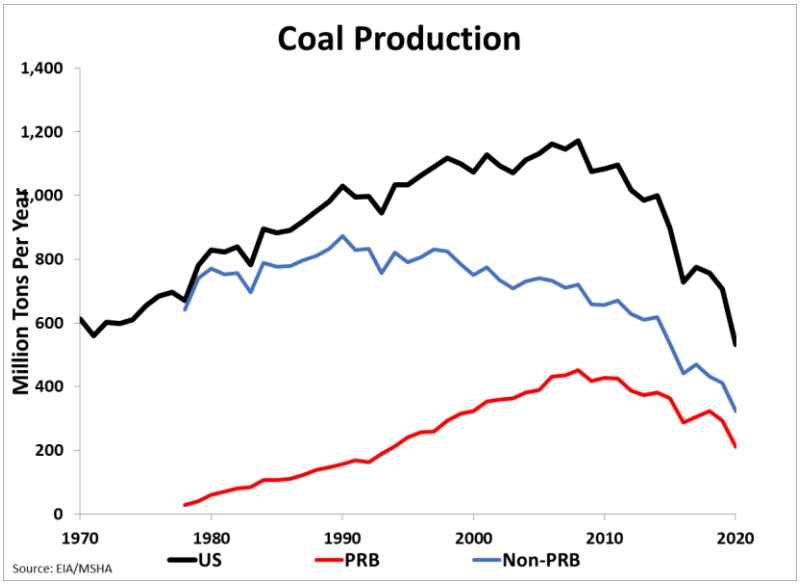
and ship coal through the bankruptcy proceedings. In the last case, the mines were returned to production after their sale to a new operator.

The Hayden and Craig plants purchased 4.5 MT in 2020 and are served by three local Colorado coal mines. With the announced retirement of Craig Units 1&2[2] and both the Hayden Units by 2028,[3] there appears to be sufficient production capacity and coal reserves at these three mines to supply the plants through their planned retirements.

US and Powder River Basin Coal Production and Demand

Between 1970 and 2008, annual coal production in the U.S. increased from 612.7 MT to 1,171.8 MT (Figure 1) as coal demand for electric power, which consumed an average of 88% of the coal produced between 2001 and 2019 (Figure 2), increased. In the late 1970s, production from the Powder River Basin (PRB) began to grow as mining and energy companies (ARCO, Mobil, Kerr McGee, Exxon, Peabody, Sunedco, and others) developed mines in this low production cost area to supply coal to the expanding electric power industry. Production in the PRB grew to a peak of 451.7 MT in 2008. While US and PRB production peaked in 2008, the combined production from other coal producing regions peaked in 1990. Since 2008, US and PRB has fallen to 532.5 and 210.0 MT, respectively.

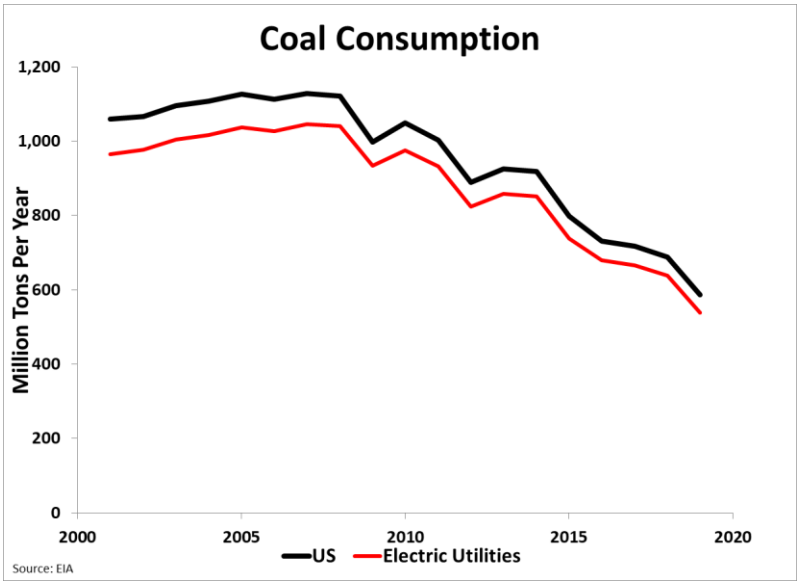
Figure 1 – US and PRB Coal Production 1970-2020



In 2001, 964.4 MT of coal were consumed by the U.S. electric power sector. This grew to a peak of 1,045.1 MT in 2007. Following the financial crash of 2008, the success of hydraulic fracturing ("fracking") in producing low-cost gas, state mandated renewable energy portfolios, and tax credits given to wind and solar energy projects, coal production for electric generation fell sharply to 538.6 MT in 2019.

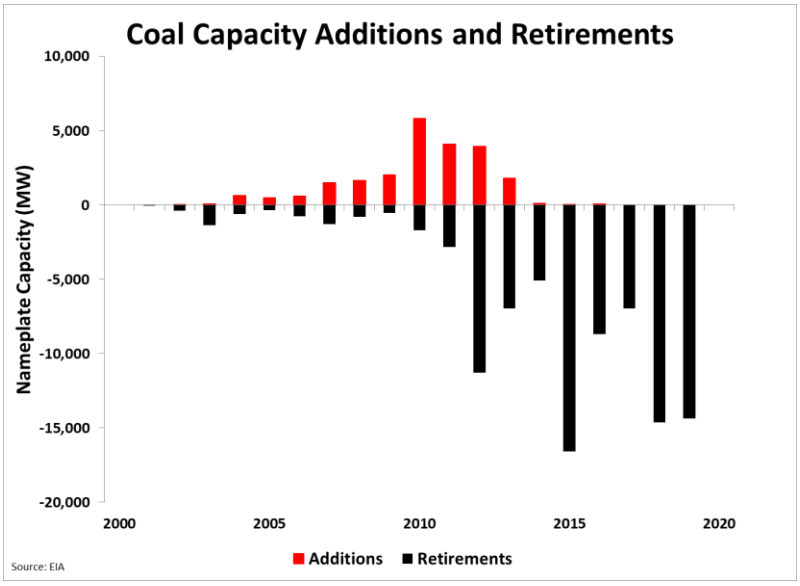
[2] Craig Station Unit 2 owners announce retirement date of Sept. 30, 2028 | Tri-State Generation and Transmission Association, Inc (tristategt.org)
[3] Xcel Energy - Xcel Energy announces retirement of Hayden power plant

Figure 2 – US Coal Consumption 2000-2019



Future demand will depend on numerous factors including changes in or additions to state mandated renewable energy portfolios, gas prices and aging power plants. US Energy Information Administration (EIA) data indicates that between 2001 and 2020, 95,131 megawatts (MW) (Nameplate Capacity) of coal fired generating capacity has been retired against 22,834 MW having been added, with almost 90% of the retirements made after 2011 (Figure 3).

Figure 3 – Coal Capacity Additions and Retirements 2001-2019



Going forward, EIA-860 data, supplemented with public announcements by various utilities, shows 126 units at 56 coal fired power plants, burning PRB coal, are expected to close or have closed between 2018 and 2045. These plants have a Nameplate Capacity of 50,348 MW and had coal receipts of approximately 64 MT in 2020, down from 117 MT in 2017 (Table 1).

Table 1 – Announced Coal Plant Retirements 2018-2045

			Nameplate		Planned				
		Generator	Capacity	Operating	Retirement	PRB Coal Receipts (plant total)			
Utility Name	Plant Name	ID	(MW)	Year	Year	2017	2018	2019	2020
ALLETE, Inc.	Clay Boswell	1	75.0	1958	2018	2,711,143	2,754,746	1,763,142	1,414,135
ALLETE, Inc.	Clay Boswell	2	75.0	1960	2018				
ALLETE, Inc.	Clay Boswell	3	364.5	1973					
ALLETE, Inc.	Clay Boswell	4	558.0	1980					
City of Colorado Springs - (CO)	Martin Drake	6	75.0	1968	2022	761,118	578,314	452,799	136,420
City of Colorado Springs - (CO)	Martin Drake	7	132.3	1974	2022				
City of Colorado Springs - (CO)	Ray D Nixon	1	207.0	1980	2029	755,923	583,527	834,890	784,384
City of San Antonio - (TX)	J T Deely	1	486.0	1977	2024	6,034,693			
City of San Antonio - (TX)	J T Deely	2	446.0	1978	2024				
Consumers Energy Co	Dan E Karn	1A	136.0	1959	2023	1,489,153	1,374,805	1,090,180	967,142
Consumers Energy Co	Dan E Karn	1B	136.0	1959	2023				
Consumers Energy Co	Dan E Karn	2A	136.0	1961	2023				
Consumers Energy Co	Dan E Karn	2B	136.0	1961	2023				
CP Crane Power, LLC	CP Crane Power, LLC	1	190.4	1961	2018	97,639	42,376		
CP Crane Power, LLC	CP Crane Power, LLC	2	209.4	1963	2018				
Dairyland Power Coop	Genoa	ST3	345.6	1969	2021	773,026	760,798	564,838	476,218
DTE Electric Company	River Rouge	3	358.1	1958	2022	420,297	377,615	188,904	
DTE Electric Company	Trenton Channel	9	535.5	1968	2022	1,054,400	775,748	799,439	138,161
Dynegy Kincaid Generation	Kincaid Generation LLC	1	659.5	1967	2027	3,064,564	2,843,057	2,241,129	1,000,056
Dynegy Kincaid Generation	Kincaid Generation LLC	2	659.5	1968	2027				
Dynegy Midwest Generation Inc	Baldwin Energy Complex	1	625.1	1970	2025	4,102,343	4,390,948	3,754,897	3,580,948
Dynegy Midwest Generation Inc	Baldwin Energy Complex	2	634.5	1973	2025				
Dynegy Midwest Generation Inc	Baldwin Energy Complex	3	634.5	1975	2025				
Dynegy Midwest Generation Inc	Havana	6	488.0	1,978	2019	1,806,210	1,536,488	940,128	
Dynegy Midwest Generation Inc	Hennepin Power Station	1	75.0	1,953	2019	1,001,513	967,086	476,961	
Dynegy Midwest Generation Inc	Hennepin Power Station	2	231.3	1,959	2019				
Electric Energy Inc	Joppa Steam	1	183.3	1953	2025	2,028,158	3,164,554	2,902,051	2,585,697
Electric Energy Inc	Joppa Steam	2	183.3	1953	2025				
Electric Energy Inc	Joppa Steam	3	183.3	1954	2025				
Electric Energy Inc	Joppa Steam	4	183.3	1954	2025				
Electric Energy Inc	Joppa Steam	5	183.3	1955	2025				
Electric Energy Inc	Joppa Steam	6	183.3	1955	2025				
Empire District Electric Co	Asbury	1	212.8	1970	2020	578,958	488,799	256,963	
FirstEnergy Generation Corp	FirstEnergy W H Sammis	1	190.4	1959	2020	212,365			
FirstEnergy Generation Corp	FirstEnergy W H Sammis	2	190.4	1960	2020				
FirstEnergy Generation Corp	FirstEnergy W H Sammis	3	190.4	1961	2020				
FirstEnergy Generation Corp	FirstEnergy W H Sammis	4	190.4	1962	2020				
FirstEnergy Generation Corp	FirstEnergy W H Sammis	5	334.0	1967	2020				
FirstEnergy Generation Corp	FirstEnergy W H Sammis	6	680.0	1969	2020				
FirstEnergy Generation Corp	FirstEnergy W H Sammis	7	680.0	1971	2020				
GenOn Power Midwest, LP	Avon Lake	9	680.0	1970	2020			59,647	85,351
Illinois Power Generating Co	Coffeen	1	388.9	1,965	2019	3,277,875	3,369,189	1,581,060	
Illinois Power Generating Co	Coffeen	2	616.5	1,972	2019				
Illinois Power Generating Co	Newton	1	617.4	1977	2027	1,802,464	1,873,819	1,960,081	1,805,318
Illinois Power Resources Generating LLC	Duck Creek	1	441.0	1,976	2019	1,097,497	1,542,972	1,115,413	
Illinois Power Resources Generating LLC	E D Edwards	2	280.5	1968	2022	1,890,610	1,843,442	1,900,477	1,932,584
Illinois Power Resources Generating LLC	E D Edwards	3	363.8	1972	2022				
Interstate Power and Light Co	Burlington (IA)	1	212.0	1968	2021	590,235	737,027	626,644	731,593
Interstate Power and Light Co	Prairie Creek	1	14.6	1997	2025	401,688	339,884	298,003	302,343
Interstate Power and Light Co	Prairie Creek	3	50.0	1958	2025				
Interstate Power and Light Co	Prairie Creek	4	148.8	1967					
Kansas City Power & Light Co	Montrose	2	188.0	1960	2018	227,718	107,057		
Kansas City Power & Light Co	Montrose	3	188.0	1964	2018				
KCP&L Greater Missouri Operations Co	Sibley	2	50.0	1962	2018	640,015	575,560		
KCP&L Greater Missouri Operations Co	Sibley	3	419.0	1969	2018				
Lansing Board of Water and Light	Eckert Station	4	80.0	1964	2020	260,000	275,987	26,367	3,492
Lansing Board of Water and Light	Eckert Station	5	80.0	1968	2020				
Lansing Board of Water and Light	Eckert Station	6	80.0	1970	2020				
Lansing Board of Water and Light	Erickson Station	1	154.7	1973	2025	545,248	459,452	379,571	
Luminant Generation Company LLC	Big Brown	1	593.4	1971	2018	4,169,285	47,477		
Luminant Generation Company LLC	Big Brown	2	593.4	1972	2018				
Luminant Generation Company LLC	Monticello	1	593.4	1974	2018	5,806,187			
Luminant Generation Company LLC	Monticello	2	593.4	1975	2018				
Luminant Generation Company LLC	Monticello	3	793.2	1995	2018				
Midwest Generations EME LLC	Will County	4	598.4	1963	2024	290,919	357,524	484,391	124,957
Northern Indiana Pub Serv Co	Michigan City	12	540.0	1974	2028	567,707	1,006,183	603,688	799,604
Northern Indiana Pub Serv Co	R M Schahfer	14	540.0	1976	2023	858,050	1,490,234	1,709,291	870,679
Northern Indiana Pub Serv Co	R M Schahfer	15	556.4	1979	2023				
Northern Indiana Pub Serv Co	R M Schahfer	17	423.5	1983	2023				
Northern Indiana Pub Serv Co	R M Schahfer	18	423.5	1986	2023				
Northern States Power Co - Minnesota	Allen S King	1	598.4	1958	2028	1,692,583	1,545,089	1,064,003	404,242

Utility Name	Plant Name	Generator ID	Nameplate Capacity (MW)	Operating Year	Planned Retirement Year	PRB Coal Receipts (plant total) 2017	2018	2019	2020
Northern States Power Co - Minnesota	Sherburne County	1	765.3	1977	2026	3,411,964	3,302,479	4,384,991	2,810,659
Northern States Power Co - Minnesota	Sherburne County	2	765.3	1976	2023				
Northern States Power Co - Minnesota	Sherburne County	3	938.7	1987	2030				
NRG Texas Power LLC	Limestone	1	893.0	1985	2030	4,896,019	5,753,908	5,789,317	3,821,684
NRG Texas Power LLC	Limestone	2	956.8	1986	2030				
NRG Texas Power LLC	W A Parish	5	734.1	1977	2045	8,534,612	9,487,882	8,792,160	6,487,724
NRG Texas Power LLC	W A Parish	6	734.1	1978	2045				
NRG Texas Power LLC	W A Parish	7	614.6	1980	2045				
NRG Texas Power LLC	W A Parish	8	654.0	1982	2045				
PacifiCorp	Dave Johnston	1	133.6	1959	2027	3,347,304	3,293,046	3,217,482	2,982,613
PacifiCorp	Dave Johnston	2	133.6	1961	2027				
PacifiCorp	Dave Johnston	3	255.0	1964	2027				
PacifiCorp	Dave Johnston	4	400.0	1972	2027				
Platte River Power Authority	Rawhide	1	293.6	1984	2030	1,253,133	1,027,140	1,101,816	1,049,651
Portland General Electric Co	Boardman	1	642.2	1980	2021	877,037	763,614	1,599,329	572,929
Public Service Co of Colorado	Comanche (CO)	1	382.5	1973	2022	5,460,224	5,670,093	4,913,015	2,573,817
Public Service Co of Colorado	Comanche (CO)	2	396.0	1975	2025				
Public Service Co of Colorado	Comanche (CO)	3	856.8	2010	2040				
Public Service Co of Colorado	Pawnee	1	552.3	1981	2028	2,331,034	2,137,789	1,738,878	2,063,349
Public Service Co of Oklahoma	Oklaunion	1	720.0	1986	2020	719,467	2,188,366	1,473,698	509,617
Salt River Project	Coronado	1	410.9	1979	2032	2,153,505	1,583,810	1,756,267	1,544,927
Salt River Project	Coronado	2	410.9	1980	2032				
Southwestern Public Service Co	Harrington	1	360.0	1976	2025	2,607,665	2,812,367	2,360,262	1,776,631
Southwestern Public Service Co	Harrington	2	360.0	1978	2025				
Southwestern Public Service Co	Harrington	3	360.0	1980	2025				
Southwestern Public Service Co	Tolk	1	567.9	1982	2037	2,842,987	2,061,403	1,671,184	1,083,167
Southwestern Public Service Co	Tolk	2	567.9	1985	2037				
Texas Municipal Power Agency	Gibbons Creek	1	453.5	1983	2023	520,733	405,141		
TransAlta Centralia Gen LLC	Transalta Centralia Generation	1	729.9	1972	2020	1,113,471	1,053,918	2,278,255	1,548,959
TransAlta Centralia Gen LLC	Transalta Centralia Generation	2	729.9	1973	2025				
Union Electric Co - (MO)	Labadie	1	573.7	1970	2036	9,413,306	8,828,013	7,641,075	9,642,532
Union Electric Co - (MO)	Labadie	2	573.7	1971	2036				
Union Electric Co - (MO)	Labadie	3	621.0	1972	2042				
Union Electric Co - (MO)	Labadie	4	621.0	1973	2042				
Union Electric Co - (MO)	Meramec	3	289.0	1959	2022	474,920	910,207	299,888	
Union Electric Co - (MO)	Meramec	4	359.0	1961	2022				
Union Electric Co - (MO)	Rush Island	1	621.0	1976	2039	5,032,159	4,430,204	3,482,385	3,777,191
Union Electric Co - (MO)	Rush Island	2	621.0	1977	2039				
Union Electric Co - (MO)	Sioux	1	549.7	1967	2028	2,144,990	2,604,901	1,875,932	1,186,802
Union Electric Co - (MO)	Sioux	2	549.7	1968	2028				
Wisconsin Electric Power Co	Pleasant Prairie	1	616.6	1980	2018	3,066,407	664,663		
Wisconsin Electric Power Co	Pleasant Prairie	2	616.6	1985	2018				
Wisconsin Electric Power Co	Presque Isle	5	90.0	1,974	2019	585,031	318,830		
Wisconsin Electric Power Co	Presque Isle	6	90.0	1,975	2019				
Wisconsin Electric Power Co	Presque Isle	7	90.0	1,978	2019				
Wisconsin Electric Power Co	Presque Isle	8	90.0	1,978	2019				
Wisconsin Electric Power Co	Presque Isle	9	90.0	1,979	2019				
Wisconsin Electric Power Co	South Oak Creek	5	299.2	1959	2024	2,776,961	2,925,628	2,214,050	1,720,621
Wisconsin Electric Power Co	South Oak Creek	6	299.2	1961	2024				
Wisconsin Electric Power Co	South Oak Creek	7	317.6	1965	2024				
Wisconsin Electric Power Co	South Oak Creek	8	324.0	1967	2024				
Wisconsin Power & Light Co	Edgewater	4	351.0	1969	2018	2,354,509	1,861,154	987,771	679,904
Wisconsin Power & Light Co	Edgewater	5	413.7	1985	2022				
Wisconsin Public Service Corp	Pulliam	7	81.6	1958	2018	330,832	51,872		
Wisconsin Public Service Corp	Pulliam	8	149.6	1964	2018				
		126	50,347.9			117,257,854	100,346,185	85,652,712	63,976,099

Source: EIA 860 - Plant name, Planned Retirement Year and Nameplate Capacity
Public announcements by various utilities
EIA 923 – Fuel Receipts

US Energy Information Administration Annual Energy Outlook 2020

The EIA prepares an Annual Energy Outlook (AEO). The AEO provides a projection of electric power demand and fuel sources required to meet that demand. The AEO includes a Reference case plus side cases that test various assumptions included in the Reference case.

What is the AEO2020 Reference case?

- The AEO2020 Reference case represents EIA's best assessment of how U.S. and world energy markets will operate through 2050, based on key assumptions intended to provide a base for exploring long-term trends.
- The AEO2020 Reference case should be interpreted as a reasonable baseline case that can be compared with the cases that include alternative assumptions.
- EIA based the economic and demographic trends reflected in the Reference case on the current views of leading economic forecasters and demographers. For example, the Reference case projection assumes improvement in known energy production, delivery, and consumption technologies.
- The Reference case generally assumes that current laws and regulations that affect the energy sector, including laws that have end dates, are unchanged throughout the projection period. This assumption makes it possible for us to use the Reference case as a benchmark to compare policy-based modeling.
- The potential effects of proposed legislation, regulations, or standards are not included in the AEO2020 cases.

Source: EIA Annual Energy Outlook 2020

This report does not include an analysis of the AEO or the accuracy thereof but finds the Reference case to be a convenient tool to assess the life of remaining reserves in the PRB. This assessment requires assumptions on future demand and the distribution of that demand between the mines in the PRB.

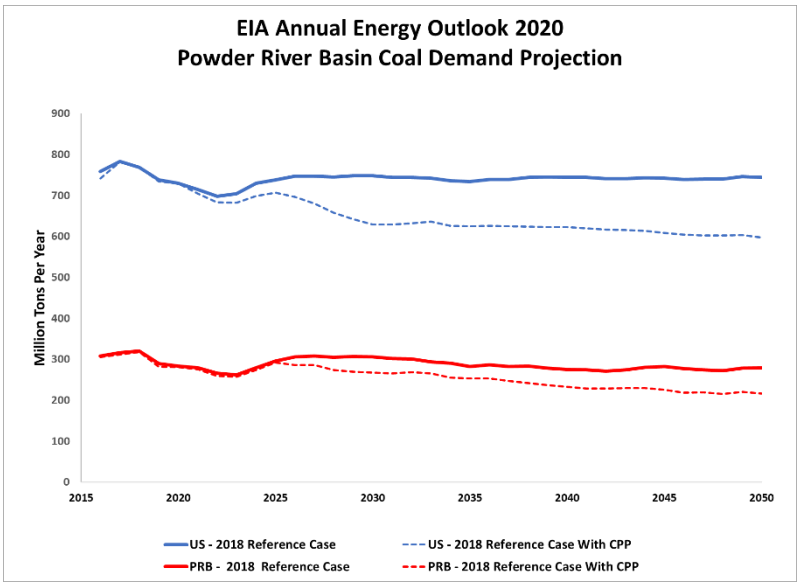
Figure 4 shows the future demand, as projected by the AEO Reference Case plus the Reference Case with the Clean Power Plan (CPP) for the US and the PRB. Note that the AEO projects falling demand for PRB coal through 2023 as demand falls from 320 MT in 2018 to 261 MT in 2023 before it rises to 308 MT in 2027. The AEO attributes changing demand for coal as follows:

—as capacity factors increase for the more efficient coal-fired units that remain in service

- In addition to decreases as a result of competitively priced natural gas and increasing renewables generation, coal-fired generating capacity decreases by 109 GW (or 46%) between 2019 and 2025 to comply with the Affordable Clean Energy (ACE) rule before leveling off near 127 GW in the AEO2020 Reference case by 2050.
- Average capacity factors for coal-fired generating units improve over time as less-efficient units are retired, as heat rates in the remaining coal fleet improve to comply with the ACE rule, and as natural gas prices increase
- Between 2019 and 2025, coal-fired generation decreases by 26% in the Reference case while natural gas prices increase. By 2030, the utilization rate of the remaining coal-fired capacity returns to 65%, which is slightly less than in the early 2000s. In the High Oil and Gas Supply case, coal-fired generation decreases by 42% between 2019 and 2025, and lower natural gas prices limit the utilization rate of the coal fleet to about 60% in 2030.
- Higher natural gas prices in the Low Oil and Gas Supply case slow the pace of coal power plant retirements by about 23 GW through 2025 compared with the Reference case. The Low Oil and Gas Supply case has 155 GW of coal-fired capacity still in service in 2050. Conversely, lower natural gas prices in the High Oil and Gas Supply case increase coal-fired power plant retirements by 28 GW in 2025, and 96 GW of remaining coal-fired capacity remains by 2050.

Source: EIA Annual Energy Outlook 2020

Figure 4 EIA Annual Energy Outlook 2020, PRB Coal Demand Projection



In light of 2017 -2020 production as well as announced retirements described above, a projected drop in production through 2023 is reasonable although 2020 production was well below the AEO projection. An 18% increase between 2023 and 2027 is considered unlikely. The AEO projects that most electric capacity retirements occur by 2025, and they will taper off in the later years of the projection period. The AEO assumes that the remaining fleet of coal fired power plants will continue to operate through 2050. This is considered unlikely as a cursory review of EIA-860 data indicates there may be over 62,000 MW of nameplate capacity at US coal fired power plants, that received almost 124 MT of coal in 2020, will have been in operation 50+ years by 2050.

In summary, while the author has not performed an analysis of the AEO, it is the author's opinion that the AEO Reference case overstates the future demand for PRB coal.

A final point related to the AEO; the EIA recognizes that there are adequate coal reserves in the PRB to meet their demand projections.

NOTE: While analysis of the CPP and Affordable Clean Energy Plan (ACE) is outside of the scope of this report, on January 19, 2021 a federal appellate court ruled against ACE. After the ruling, the Environmental Protection Agency (EPA) filed an unopposed motion to partially stay the CCP to assure the CCP did not take effect while the EPA considered how to best regulate power plants' greenhouse gas emissions. As shown on Figure 4, the CPP was expected to reduce the demand for coal nationwide and in the PRB, extending the life of reserves at existing mines.

PRB Geology and Mining

Geology

The PRB covers an area roughly 300 miles north to south and 100 miles east to west. While there are several coalfields in the PRB, this analysis covers the Gillette Coalfield, the most prolific coalfield in the United States, which covers an area about 60 miles long that extends from just north of the town of Gillette, Wyoming to just south of the Campbell-Converse county line south of Gillette. While coal seam

nomenclature has varied over the years, almost all the production from the Gillette Coalfield has come from the Roland and Wyodak-Anderson seams. The coal seam thickness at the mines in the coalfield vary from 25 feet to 100 feet. The coal seams outcrop on the east side of the coalfield. The depth of overburden over the coal increases as mining progresses to the west.

According to the 2015 USGS report entitled *Coal Geology and Assessment of Coal Resources and Reserves in the Gillette Coal Field, Powder River Basin, Wyoming* published in 2015, there are about 162 billion tons of recoverable Powder River Basin coal resources at a stripping ratio of 10:1 or less. The report shows that there are an estimated 25 billion tons in the Powder River Basin that are recoverable at current coal market prices. This represents almost 120 years of coal at 2020 production levels. If market prices increase, more of the Powder River Basin coal will be recoverable.

The mines can be divided into three groups: North Gillette, South Gillette and Wright area mines. The North Gillette mines are those mines north of the town of Gillette: Buckskin, Rawhide, Eagle Butte, Dry Fork and Wyodak. The South Gillette mines are a group of mines South of Gillette: Caballo, Belle Ayr, Cordero-Rojo and Coal Creek. The Wright area mines are at the south end of the coalfield, east and south of the town of Wright: Black Thunder, North Antelope Rochelle (NARM), and Antelope.

The North Gillette mines produce an 8,200 to 8,500 Btu.lb coal, South Gillette mines typically produce an 8,500 to 8,600 Btu/lb. product and the Wright area mines average around 8,800 to 9,000 Btu/lb.

Mining Technology

Mining methods vary from mine to mine, but operating mines use truck/shovel or a combination of truck/shovel and draglines operations for overburden removal. Truck/Shovel mines use a fleet of large electric shovels teamed with large rear-dump trucks with a payload capacity of 250 tons or more. After blasting, overburden is loaded into the trucks and transported to a site selected for dumping. Draglines are large pieces of mining equipment used to remove overburden above coal and place it in a previously mined pit, adjacent to the pit to be mined. Draglines in the PRB have bucket capacities ranging from 44 cubic yards to 164 yards.

Truck/shovel operations are more expensive in terms of cost per Bank Cubic Yards per Ton (BCYT) moved but are more flexible in their use and can move overburden from where it is excavated to its final disposal site in a single operation. Truck/Shovel fleets also tend to be less capital intensive.

Draglines have a lower cost per BCYT moved but are more capital intensive and are limited in how far they can move overburden. In most cases, in the PRB, overburden moved with a dragline must be handled more than once, increasing the cost of the dragline operation. In almost all cases in the PRB, truck/shovel fleets are used in conjunction with draglines, pre-stripping ahead of the dragline and reducing the amount of material the dragline must rehandle.

Coal loading and transportation is performed with a truck/shovel fleet like those used in overburden removal. The coal is moved from the pit to a truck dump where it is dumped into a coal hopper/crusher and moved to a rail loadout where it is loaded into unit trains for shipment to customers. In many cases, the dump site is being moved to a location close to the pit and then moved to the rail loadout on an overland conveyor. This reduces the number of trucks required to move the coal along with the number of drivers. It also tends to have a lower operating cost and is less susceptible to increases in the cost of diesel fuel.

As noted in the following Coal Revenue and Production Cost Trends section, stripping ratios have increased slowly over time and will continue to rise as mining continues. PRB mines have responded by implementing some, or all, of the following to control costs:

1) Converting to larger equipment,
2) Incorporating more dragline capacity,
3) Using cast blasting to move overburden,
4) Constructing overland conveyors to reduce truck haul distances,
5) Adding autonomous (remote operated) equipment such as dozers, and
6) Revising work schedules.

Transportation

With few exceptions all coal mined in the PRB is transported by rail. The two railroads serving the PRB are the Burlington Northern Santa Fe (BNSF) and the Union Pacific (UP). The BNSF is the sole carrier for the North Gillette mines while the South Gillette and Wright area mines are served by both the BNSF and UP on the Joint Line. BNSF serves all mines in the PRB, has access to its mainline through Gillette, Wyoming and has better access to markets in the northern U.S. The UP is limited to moving coal south out of the PRB to markets to the east, south, southeast and southwest. The BNSF and UP have made significant investments in the rail infrastructure to transport PRB coal to coal fired plants. Over 440 million tons of PRB coal was transported out of the PRB in 2008 and there appears to be plenty of rail transportation capacity for expected production levels.

Energy Industry Trends

Following the financial crash of 2008, the success of fracking in producing low-cost gas, state mandated renewable energy portfolios, and tax credits given to wind and solar energy projects, coal production for electric generation fell sharply. These conditions are expected to continue, dampening the demand for and production of coal.

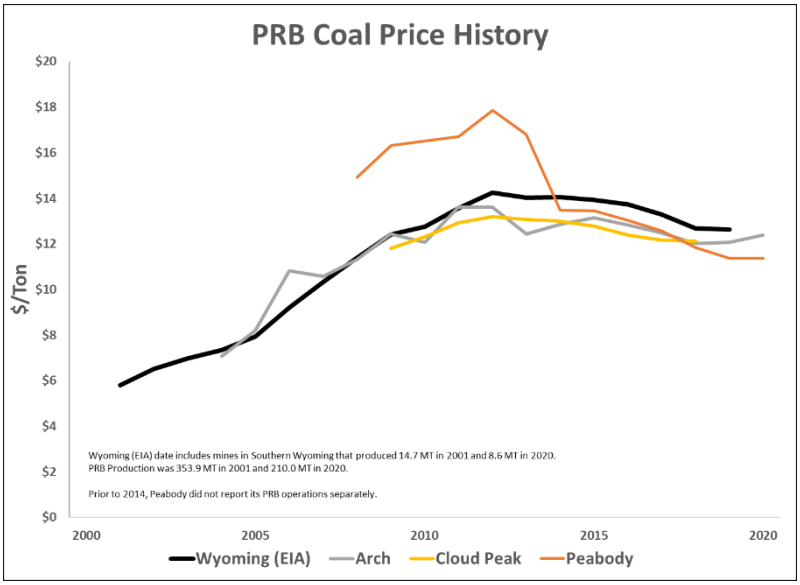
Political and regulatory actions can impact future energy trends. For example, halting the leasing of coal would have an impact on PRB coal production as existing leases are mined out, starting around 2032. Changes in environmental laws and regulations relating to power generation could also have the potential of impacting future coal production.

Coal Revenue and Production Cost Trends

Coal production costs have varied over the years as the mines have encountered varying mining conditions. Figure 5 provides historic sales prices for Wyoming coal. These prices include coal production from non-PRB mines in southern Wyoming which represent about 4% of the state's production. Because the PRB represents the vast majority of Wyoming coal production statewide price provides a reasonable approximation of the annual average PRB coal price trends. In addition to EIA's *Coal Annual* average coal price, the Figure provides annual prices for the three largest producers in the PRB: Arch, Cloud Peak and Peabody. The data for Arch, Cloud Peak and Peabody were collected from corporate annual reports. (Note that Arch reports were available going back to 2004, Cloud Peak was spun off from Rio Tinto in 2009 and Peabody did not separate its PRB operations from its other western

US mines until 2014. Cloud Peak filed for bankruptcy in May 2019 and was sold to Navajo Transitional Energy Company (NTEC) in October 2019.

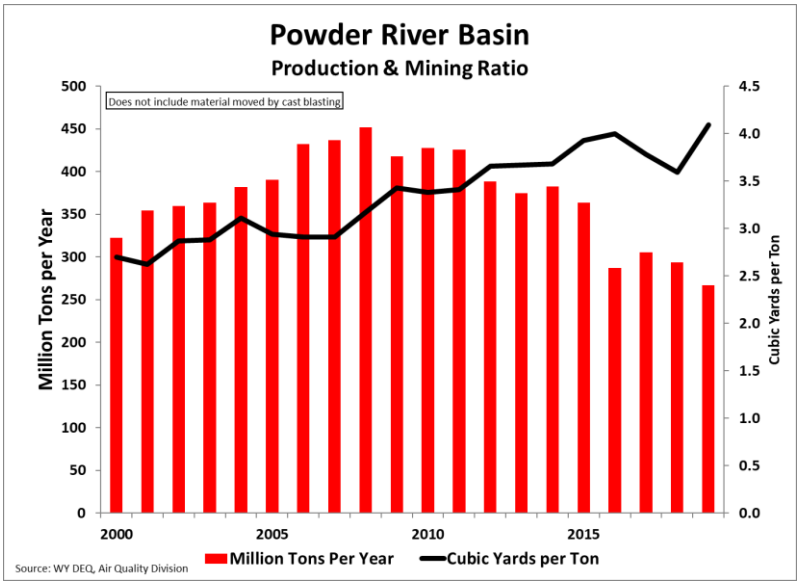
Figure 5 – PRB Coal Price History 2001-2020



Stripping Ratio

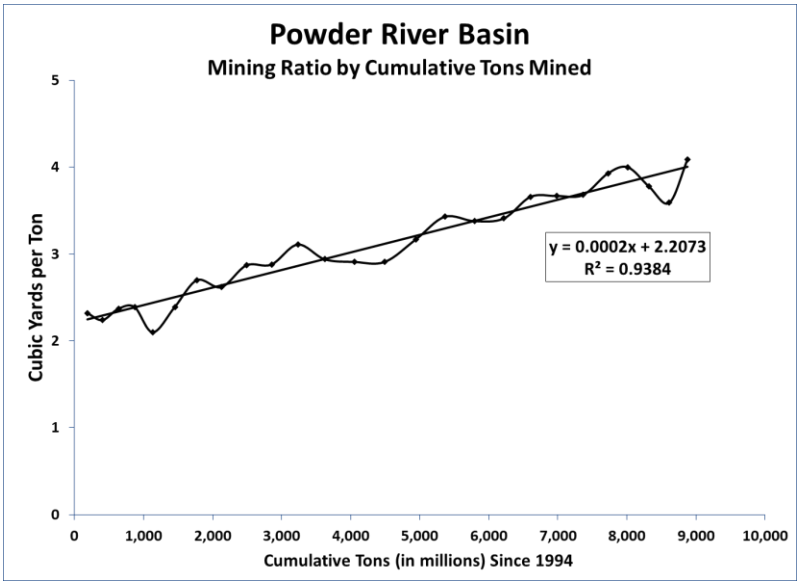
Figure 6 provides production and mining ratio trends in the PRB since 2001. The stripping ratio is a measure of the amount of overburden or waste material that must be moved for each ton of coal mined, is an indicator of mining costs and generally tracks increasing coal prices and, thus, increasing mining costs.

Figure 6 – PRB Production and Mining Ratios 2000-2019



Analysis of stripping ratio data shows the stripping ratio in the PRB has been increasing at a rate of 0.02 BCYT per 100 MT mined. Assuming this trend continues, the average stripping ratio will increase to approximately 5:1 BCYT in 2040. This relationship is illustrated on Figure 7.

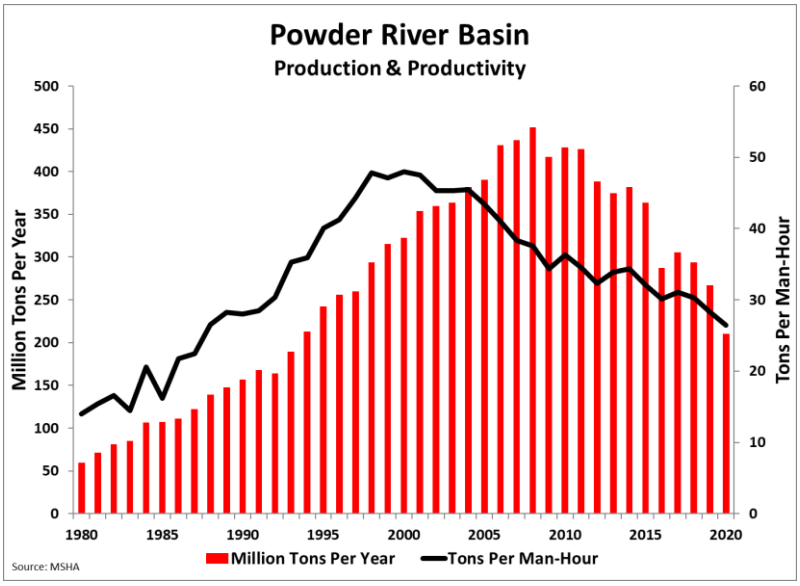
Figure 7-PRB Mining Ratio by Cumulative Tons Mined Since 1994



Labor Productivity

Figure 8 provides production and productivity trends since 2001. Like the stripping ratio, productivity is an indicator of mining costs. In this case there is an inverse relationship as declining productivity results in more employee hours, with increased labor costs, required to mine an equal amount of coal.

Figure 8 – PRB Labor Productivity 1980-2020



PRB Production Royalties, Taxes and Fees

Royalties, severance taxes, property taxes, reclamation fees and black-lung taxes are a significant part of the operating costs reported by coal producers. In aggregate, these costs account for approximately 30% of the coal sales price. Other costs that are not included below are bonus lease payments, which have exceeded $1.35/ton. Table 2 provides a breakdown of these costs:

Table 2 - PRB Production Royalties, Taxes and Fees

Federal	
Royalty	12.5% of price
Reclamation Tax	$0.28/ton
Black Lung Tax	4.4% of price with a $0.55/ton cap
Wyoming	
Severance Tax	8.5% of price (adjusted for coal hauling and processing) less royalties
Property Tax	6.7% of price (adjusted for coal hauling and processing) less royalties

Note that the Black Lung Tax was established in 1977 at $0.25 per ton for surface mines capped at 2% of the sales price. The rate was increased to $0.55 per ton capped at 4.4% through December 31, 2018. The rate dropped to the original $0.25 per ton/2% for calendar year 2019. Congress raised the rate back up to $0.55/4.4% for 2020 in the Further Consolidated Appropriations Act of 2020 signed in December 2019 and again for 2021 through Consolidated Appropriations Act for 2021 signed in December 2020. The Black Lung Tax is currently scheduled to drop back down to $0.25/2% on January 1, 2022. Similarly, the Federal Reclamation tax established in 1977 is due to expire on September 30, 2021. If the Black Lung Tax is allowed to remain at the reduced level or the Reclamation Fee is allowed to expire, it would significantly reduce the cost of producing PRB coal.

Projected PRB Reserves, Demand and Mine Life

PRB Coal Reserves

Estimating the life of mines requires an estimate of available reserves. For this analysis, PRB reserves are broken into three categories: current reserves held by operating companies, pending Lease-by-Applications (LBAs) and withdrawn LBAs. Additional reserves have been identified by the USGS that are not being considered in this analysis.

Current reserves held by Arch and Peabody are based on reserves reported in the company's annual reports. Other mine reserves are based on mine permit data.

Additional reserves may be acquired through the LBA process. The Bureau of Land Management (BLM) established the process where companies can nominate reserve blocks for leasing in a competitive bid process. Once a tract has been applied for, the BLM conducts an EIS on the tract and goes through a public hearing process. During the process, the BLM may modify the tract by adjusting the boundaries of the tract or splitting the tract into several tracts. Once the EIS process is completed a decision will be made to conduct a lease sale or reject the application. Before the sale takes place, the BLM prepares an estimate of the fair market value of the tract. The estimated fair market value is closely guarded and is used to ensure any bid on the tract meets or exceeds the fair market value of the tract. This process has resulted in 27 tracts, containing an estimated 7.9 billion tons of coal with lease bonus bids more than $5 billion, being leased since 1991. The LBA process has been suspended by the current administration while it is being evaluated by the BLM.

At present, there are three pending LBAs, containing 1.1 billion tons of coal, which may be offered for sale.

Properties impacted by the suspension include 7 LBA tracts, containing almost three billion tons of coal that were withdrawn from the process at the request of the applicant. The requests to withdraw the application are believed to be the result of expected high bonus bid requirements and a longer than initially expected time before the leases are required. (The most recent bids have been as high as $1.35 per ton.) It is possible for these tracts to be applied for in the future if the LBA process is resumed.

Table 3 provides a breakdown of reserves for each of the three categories being considered in this analysis.

Table 3 PRB Coal Reserves (End-of-year 2020)

Current Reserves		
Company	**Mine**	**Reserves (MT)**
Arch Coal	Black Thunder	698
	Coal Creek	90
ESM	Belle Ayr	238
	Eagle Butte	272
NTEC	Antelope	429
	Cordero Rojo	264
Peabody	Caballo	435
	NARM	1,544
	Rawhide	191
Western Energy	Dry Fork	224
Black Hills Energy	Wyodak	183
Kiewit Mining	Buckskin	111
		4,679
Pending LBAs		
	Applicant or	
Tract	**Succesor**	**Reserves (MT)**
North Hilight	Arch	468
Maysdorf II South	NTEC	234
West Antelope III	NTEC	441
		1,143
Withdrawn LBAs		
	Applicant or	
Tract	**Succesor**	**Reserves (MT)**
West Hilight Field	Arch	428
Hay Creek II	Kiewit Mining	148
Belle Ayr West	ESM	253
West Coal Creek	Arch	57
Antelope Ridge	Peabody	1,001
West Jacobs Ranch	NTEC	956
Maysdorf II	NTEC	149
		2,992
Total Reserves		8,814

PRB Coal Demand

A demand forecast has been prepared on a mine-by-mine basis for each of the producing mines in the PRB. The forecast assumes each mine will produce at 2020 levels less sales to plants identified as planned for retirement in Table 1. It is assumed that market shares will be maintained and sales to each of the plants identified in Table 1 will be reduced in the year following the unit retirement dates. This results in annual production falling from 210 MT in 2020 to 161 MT in 2040. Table 4 (provided as an attachment to this report) provides the results of this analysis on a mine-by-mine basis.

PRB Mine Life

This analysis estimates the remaining reserves for each of the PRB mines on an annual basis by reducing end-of-year reserves by annual production on a year-by-year basis. Current reserves will be mined first. When current reserves are depleted, additional reserves are added from the pending LBAs or the withdrawn LBAs as appropriate. As an example, Black Thunder's current reserves are forecast to be depleted in 2036 by which time the 468 MT North Hilight LBA will have been added to the mine's reserves. The North Hilight reserves will extend the mine life past 2040.

Based on this analysis, PRB may produce through 2040 with existing reserves and pending LBAs. Black Thunder will have to acquire the North Hilight tract to produce at projected rates past 2036 and Buckskin will have to acquire the Hay Creek II tract to operate past 2031.

Note: this analysis is not rendering an opinion that additional reserves will be acquired by any of the mines, only that additional reserves exist.

Financial Assessment of PSCo's Primary Coal Suppliers

Arch Resources

Arch is the US's second largest coal producer, selling 63 MT of coal in 2020. Coal is produced at eight mines in four of the country's coal producing regions: Appalachia, Illinois Basin, Powder River Basin and the Western Bituminous region.

Arch's strategic plan is to "pivot" from its "legacy" thermal assets towards its steel and metallurgical assets. As part of this plan Arch has contributed its share of the Viper mine, in Illinois, to Knight Hawk coal shedding mine closure liabilities totaling $21 million. Arch's remaining thermal assets are its PRB mines and the West Elk mine in Colorado. Arch's plan to reduce its operational footprint in the PRB is to accelerate the closure and final reclamation of the Coal Creek mine. The mine will ship on its existing contracts in 2021 before beginning final closure of the mine's active pit in 2022. To accomplish this, 40 employees plus equipment have been transferred from the Black Thunder mine to Coal Creek to accelerate ongoing reclamation. Black Thunder will continue to operate with cash flow being directed toward funding final reclamation of the mine. No plans for the West Elk mine have been announced. As this is being done, Arch is exploring strategic alternatives for these assets.

In June 2019, Arch and Peabody entered into an agreement to combine their PRB and Colorado assets in a joint venture. The joint venture was to be 66.5% owned by Peabody and 33.5% owned by Arch. Peabody was to be the operating partner. In September 2020, a US District Court upheld a Federal Trade Commission decision to block the joint venture.

In July 2015, Arch tried to restructure their highly leveraged balance sheet with an exchange offer. Arch was saddled with debt since its 2011 acquisition of International Coal Group and was suffering from a sharp drop in coal prices, stricter pollution controls, falling demand from China and increasing competition from natural gas. In January 2016, Arch filed for Chapter 11 bankruptcy protection with a plan to cut $4.5 billion in debt from its balance sheet during a prolonged downturn in the coal industry.

During its bankruptcy, Arch continued to operate and supply coal to its customers.

Arch exited bankruptcy in October 2016 and reported a profit of $238.5. million and an Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) of $417.8 million in 2017. Arch reported a profit of $233.8 million with an EBITDA or $363.2 million. In 2020, the net profit dropped to -$344.6 million with an EBITDA of $23.7 million.

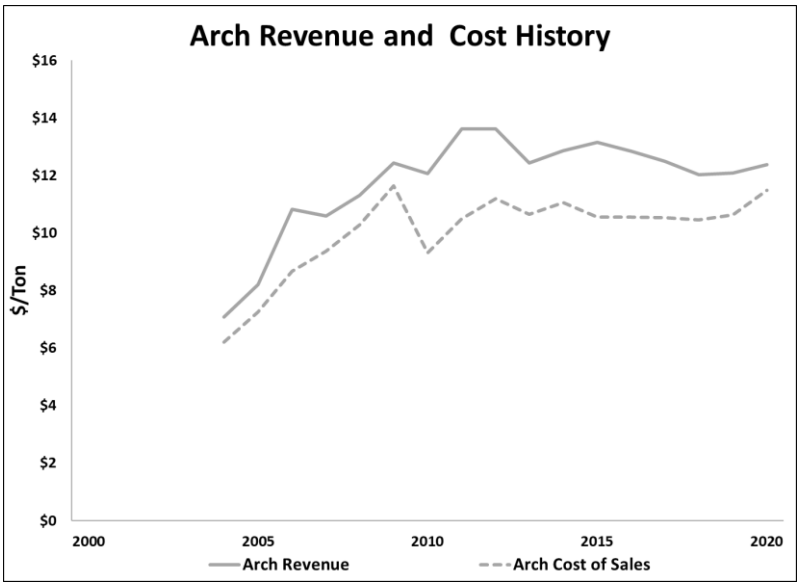
Prior to its bankruptcy, reclamation bonds at Arch's Wyoming mines were self-bonded. These bonds are now covered by surety bonds.

Arch is a long-time producer in the PRB, having purchased the Black Thunder and Coal Creek mines, along with other coal assets held by ARCO, for $1.14 billion, in 1998. At the time of the acquisition, annual production from the Black Thunder and Coal Creek mines was 42.7 and 7.0 MTY, respectively. In August 2004, Arch purchased Triton's North Rochelle and Buckskin mines for $364 million and production increased from 72.2 MT in 2004 to 87.6 MT in 2005. (The Buckskin mine was spun off to Kiewit Mining for $72.9 million.) In 2009, Arch bought Rio Tinto Energy America's Jacobs Ranch mine for $764 million and production increased from 81.1 MT in 2009 to 116.2 MT in 2010, making Black Thunder the largest coal mine in the world. When combined with the Coal Creek mine, Arch's total PRB production was 127.6 MT in 2010.

Arch's revenue and cost data by mining region has been collected from their annual reports from 2004 to 2020. Since Arch started reporting revenue and cost data on their PRB mines, revenues have increased from $7.07/ton in 2004 to $13.15 in 2015 before sliding back to $12.49/ton in 2017. At the same time, their production costs have increased from $6.21/ton in 2004 to $10.53 in 2017. The resulting operating margin has increased from $0.86/ton to $1.96/ton or from 12% to 16% of revenue.

In 2020, revenue was $12.38/ton and production costs were $11.48/ton resulting in an operating margin of $0.90/ton. See Figure 9.

Figure 9 – Arch Revenue and Cost History



Colowyo Coal Company, LP

Colowyo Coal Company LP is a wholly owned subsidiary of Tri-State Generation and Transmission Association, Inc. (Tri-State), a taxable wholesale electric power generation cooperative on a not-for-profit basis, that was incorporated in Colorado in 1952. The Association serves large portions of Colorado, Nebraska, New Mexico and Wyoming. In 2020, Tri-State's operating revenues were $1.2 billion.

Tri-State owns and operates the Colowyo mine, located near Meeker, Colorado, and supplies coal to the Craig Station. The mine was purchased from Rio Tinto in 2011. Tri-State owns 24% of units 1 and 2 at the Craig Station and 100% of unit 3. (PSCo owns 9.7% of units 1 and 2.)

Financial data is not available for the Colowyo mine.

Eagle Specialty Materials LLC (ESM)

ESM, a privately held company, acquired the Belle Ayr and Eagle Butte mines from the bankrupt Blackjewel LLC in October 2019. Blackjewel acquired the mines from Contura Energy and operated the mines under a mining license from Contura pending the transfer of permits and reclamation bonds. Blackjewel filed for bankruptcy before the bonds and permits were transferred and they are still held by Contura. ESM is now operating under a license agreement from Contura pending bond and permit transfers. Under the agreement between Contura and ESM, Contura paid ESM $81.3 million at closing and agreed to pay an additional $8.7 million into an escrow account to be used to make payment in respect of a federal royalty claim against Contura.

In late February 2021 an agreement, subject to bankruptcy court approval, between the Department of the Interior, the Blackjewel estate and ESM to settle claims on nearly $62 million worth of unpaid royalties incurred while Blackjewel was operating the Belle Ayr and Eagle Butte mines. This agreement could pave the way for transferring coal leases and mine permits to ESM.

In December 2017, Contura transferred the Belle Ayr and Eagle Butte mines to Blackjewel LLC, paying Blackjewel $21 million to take over the mines and assume reclamation and other liabilities. Blackjewel operated the mines under a license agreement with Contura pending the transfer of the mine permits to

Blackjewel. The transfer, however, was never completed. On July 1, 2019, Blackjewel filed for Chapter 11 reorganization bankruptcy. At the time of the filing, Blackjewel reported unsecured claims of more than $100 million related to the Belle Ayr and Eagle Butte mines. These claims included $60 million in unpaid federal royalties, $37 million in taxes due to Campbell County, Wyoming, and $12 million in taxes owed to Wyoming. Unlike other bankruptcies in the PRB the Belle Ayr and Eagle Butte mines did not continue operating as normal during the bankruptcy. Most workers were locked out and only limited shipments were made.

In a complicated process, Contura "repurchased" the mines it had sold two years earlier. When Contura announced that it did not have long-term plans for the mines, a new buyer was found. On October 18, 2019 Contura announced that it had closed a transaction with Eagle Specialty Materials (ESM), a subsidiary of FM Coal, in which ESM acquired the Belle Ayr and Eagle Butte mines. The deal appears to include an agreement with the Office of Surface Mining, Reclamation and Enforcement (OSM) that releases Contura from any liability created by ESM from the time ESM assumes operational responsibility for the permits until the permits are transferred to ESM. Contura has now paid ~$110 million to shed itself of the reclamation liability at the Belle Ayr and Eagle Butte mines and the permits still must be transferred.

Belle Ayr is the oldest of the modern-era mines in the PRB having been opened by AMAX Coal in 1972. Eagle Butte was opened by AMAX in 1978. These mines have changed hands multiple times over the years and were owned by Alpha Natural Resources (ANR) in 2015. Production at the two mines peaked at 51.6 MT in 2007 and has since fallen to 23.5 MT in 2020.

In August 2015, ANR filed for bankruptcy. The company had lost almost all its market value since 2011, after it bought Massey Energy Co. for about $7 billion leaving ANR deeply in debt as metallurgical coal prices plunged. In July ,2016, Contura Energy was formed by the creditors of ANR to acquire the core metallurgical and thermal coal assets, including ANR's PRB mines, in connection with its restructuring. Contura emerged from bankruptcy in June 2016 and began trading on the Over-The-Counter market (CNTE) in August 2017.

Blackjewel operated the Belle Ayr and Eagle Butte mines under a license agreement with Contura pending the transfer of the mine permits to Blackjewel. The mine permits were never transferred.

ESM is privately held, and financial data is not available.

Kiewit Mining Group

The Kiewit Mining Group is part of the employee owned, Kiewit Corporation a construction and engineering company that has been in business since 1864. Kiewit reported revenues of $10.4 billion in 2019. Kiewit owns and operates the Buckskin mine in the PRB, and contract mines the Walnut Creek and San Miguel mines in Texas. The company has a long history of coal mining and reclamation including the Rosebud mine near Hanna, Wyoming, and the Big Horn mine north of Sheridan, Wyoming.

Financial data is not available for the Kiewit Mining Group.

Navajo Transitional Energy Company LLC

NTEC, a privately held LLC owned by the Navajo Nation, purchased Cloud Peak's three PRB mines out of bankruptcy in November 2019 paying $15.7 million in cash plus a promissory note for $40 million. This made NTEC, which owns the Navajo mine in New Mexico, the third largest coal producer in the US. NTEC mines produced 43.5 million tons in 2020. NTEC is currently running the PRB mines pending transfer of the mine permits and the acceptance of reclamation bonds to replace bonds held by Cloud Peak.

Cloud Peak was the third largest producer of coal in the US and the only pure-play PRB coal company. The company is a spin-off of Rio Tinto's PRB operations. By 2008, Rio Tinto had acquired the Antelope,

Cordero Rojo, Decker (50%), Jacobs Ranch and Spring Creek mines. Rio Tinto decided to sell these mines as a unit but was unable to find a buyer during the financial crash in 2008. The Jacobs Ranch mine was sold to Arch in 2009 and remainder of the mines were spun-off in the creation of Cloud Peak Energy. In 2014 Cloud Peak's interest in the Decker mine was sold to their partner Ambre (now Lighthouse).

In June 2012, Cloud Peak acquired Youngs Creek Mining Company, South of the Spring Creek mine, from Chevron and CONSOL for $300 million. Cloud Peak continued to work on permitting and developing Young's Creek but never began coal production despite significant investment.

In July 2012 Cloud Peak reached option agreements to lease and mine an estimated 1.4 billion tons of coal, in three deposits west of Spring Creek, on the Crow Indian Reservation. The Option and Exploration Agreements provide for exploration rights and exclusive options over an initial five-year term, with two extension periods through 2035. The agreement calls for payments the exercise of an option or options to lease, production royalties and coal production taxes to be paid to the Crow Tribe. These tax and royalty payments would range from 21% – 30% of the coal sales price. Big Metal was the Cloud Peak subsidiary holding the options. In June 2013, the U.S. Department of Interior, through the Bureau of Indian Affairs (BIA) approved the agreement.

Big Metal paid the Crow Tribe $2.25 million upon signing the Exploration Agreement and Option to Lease Agreement plus an additional $1.5 million upon BIA approval of these agreements, plus annual option payments thereafter during the initial option term that could bring total option payments to $10 million. Substantial multi-million-dollar payments would be made to the Tribe upon the exercise of a lease or leases.

In June 2014, Cloud Peak began exploratory drilling on the Crow lands and, on June 7, 2018, delivered notice to the Crow Tribe to exercise the Upper Youngs Creek coal lease option and extended the coal lease option for the Squirrel Creek and Tanner Creek project areas. In connection with the option exercise and option extension, Big Metal paid approximately $1.8 million to the Crow Tribe in June 2018. The coal lease will require completion of land access agreements and approval from the U.S. Department of Interior.

NTEC acquired these agreements as part of their purchase of Cloud Peak but their current status is unknown.

In 2018, a series of adverse events impacted Antelope. These included a delayed dragline move due to nesting golden eagles and severe thunderstorms that led to spoil pile slope stability problems. These events led to an unplanned drop in production from 28.5 MT in 2017 to 23.2 MT in 2018 with an accompanying drop in productivity from 26.4 TPMH to 20.1 TPMH. In addition to the impact on 2018 production, pre-stripping work planned for 2018 was deferred into 2019, increasing projected costs in 2019. On top of the issues at Antelope, there was a significant drop in export prices that impacted the Spring Creek mine. Finally, a weak market for 8,400 Btu coal led to reduced production at the Cordero mine. As a result of these events, Cloud Peak announced a "Strategic Alternatives Review" in November 2018.

The "Strategic Alternatives Review" concluded that a sale process in Chapter 11 bankruptcy was the best alternative for Cloud Peak and the company filed for Chapter 11 bankruptcy with the planned outcome being the sale of the company. In August 2019, the NTEC was the winning bidder for substantially all of Cloud Peak's assets in a competitive auction that took place as part of the Chapter 11 process. The key financial terms of NTEC's bid included a $15.7 million cash payment at closing, a $40 million second lien promissory note and a five year $0.15/ton royalty on future tons produced (royalties on Cordero production are limited to production more than 10 MTY). NTEC also agreed to assume pre- and post-petition tax liabilities and federal and stare royalty payments, all reclamation obligations, and up to $20 million in post-petition accounts payable. NTEC also agreed to carve-out certain real estate parcels, which Cloud Peak will market separately.

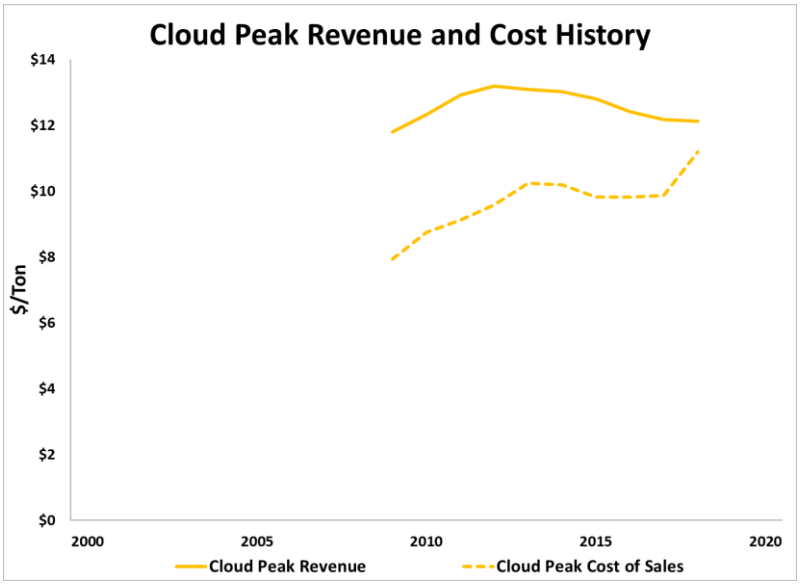
Cloud Peak's production from the Antelope and Cordero Rojo mines peaked at 76.5 MT in 2011 eventually falling to 29.6 MT in 2020. Cloud Peak also operated the Spring Creek mine, near Decker, Montana, which produced 19.1 MT in 2011, falling to 9.5 MT in 2020. Spring Creek exports thermal coal to the Asian market with annual volumes that have varied between 4.7 MT in 2011 and 2013 and 0.6 MT in 2017.

Since 2013, Cloud Peak had shown Operating Income (Loss) ranging from $131.8 million in 2014 to a loss of ($81.4) million in 2015. During the same time, they reported positive EBITDA in all years, ranging from $98.6 million in 2016 to $218.6 million in 2013.

All of Cloud Peak's reclamation bonding requirements are covered with surety bonds.

Cloud Peak began reporting revenue and cost data in 2009. From its first annual report for 2009 through 2018, Cloud Peaks annual revenue had fallen in a tight range of $11.79/ton to $13.19/ton with an average of $12.58/ton. Revenue was $12.11/ton in 2018. Production costs ranged from $7.94/ton in 2009 to $9.87/ton in 2017 and $11.19/ton in 2018. Note that 2018 costs were driven up by adverse conditions at Antelope. Since NTEC is a privately held company, more recent data is not available. Note that Cloud Peak includes their Spring Creek mine near Decker, Montana. See Figure 10.

Figure 10 – Cloud Peak Revenue and Cost History



Peabody Energy

Peabody Energy is the largest coal producer in the US, having sold 105.5 million tons of coal from 13 mines in six states in 2020. Peabody also sold 27.6 million tons of metallurgical and thermal coal from eight mines in Australia in 2020.

Peabody reported a net loss of -$185.1 million with an EBITDA of $883.0 million in 2019 and a loss of -$1,873.8 million and EBITDA of $258.8 million in 2020. The loss of -$1,873.8 million in 2020 included a $1,418.1 million a non-cash asset impairment charge related to the North Antelope Rochelle mine

In late 2020, Peabody reached an agreement with its 2022 bondholders, revolving credit lenders and surety bond providers to extend most of the company's near-term debt maturities to December 2024 and stabilize collateral requirements for the company's existing surety bond portfolio.

Peabody was the largest, publicly traded coal company in the world, when it filed for bankruptcy in April 2016.

Citing "unprecedented" industry pressures and a sharp decline in the price of coal, the company continued to operate while in bankruptcy, while working to reduce debt and improve cash flow. In addition to plummeting coal prices, the company mentioned weakness in China's economy, overproduction of domestic shale gas and ongoing regulatory challenges as reasons for its declining prospects.

Most of Peabody's woes were attributed to the ill-timed $5.2 billion McArthur Coal of Australia acquisition in late 2011. In 2010, MacArthur produced over 4 MT of metallurgical coal. At the time of the acquisition, Peabody management expected production to double to over 8 MT. This never occurred as demand dropped and the coal prices collapsed.

Peabody exited bankruptcy in April 2017, a year after its Chapter 11 filing. Most of its creditors supported its plan to cut over $5 billion of debt and raise capital from creditors with a $750 million private placement and a $750 million rights offering.

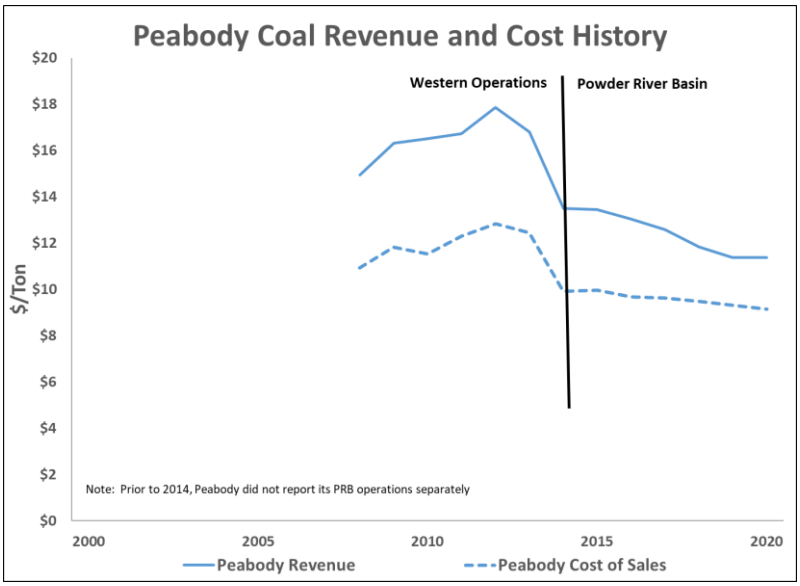
After emerging from bankruptcy Peabody reported a net income of $693 million from April 2 through December 31, 2017 and an EBITDA of $1,145.3 million for the same period.

Peabody operates the Caballo, North Antelope Rochelle (NARM) and Rawhide mines in the PRB. (NARM includes a reserve tract that may be referred to as School Creek or NARM North.) Peabody's PRB production peaked at 148 MT in 2011 before falling to 87.2 MT in 2020.

All of Peabody's PRB reclamation bonds are covered with surety bonds.

Peabody's revenue and cost data by mining region has been collected from Peabody's annual reports from 2008 to 2020. Prior to 2014, Peabody provided data on its Western Operation, which included the PRB plus its other mines in the western U.S. Since Peabody started reporting revenue and cost data on their PRB mines, revenues have declined from $13.49/ton in 2014 to $11.37/ton in 2020. During the same time, their production costs have remained stable, dropping from $9.92/ton to $9.14/ton. The resulting operating margin has fallen from $3.57/ton to $2.23/ton. See Figure 11.

Figure 11 – Peabody Revenue and Cost History

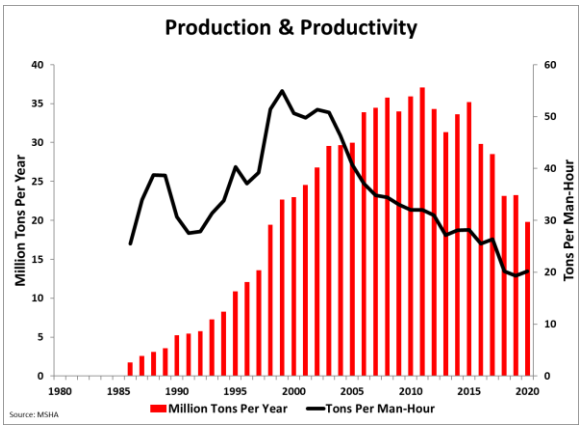


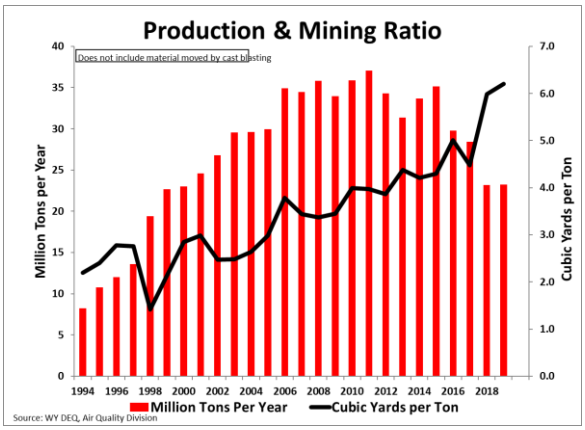
Viability Assessment of PSCo's Primary Coal Suppliers

Wyoming Powder River Basin

Antelope Mine

Cloud Peak's Antelope mine was opened in 1986 and is now owned by NTEC. It reached its peak production in 2011 when it produced 37.1 MT. In 2020, production was 19.8 MT. Labor productivity dropped from 55.0 TPMH in 1999 to 20.2 TPMH in 2020. The mining ratio has increased from a low of 1.4:1 BCYT in 1998 to 6.2:1 BCYT in 2020.





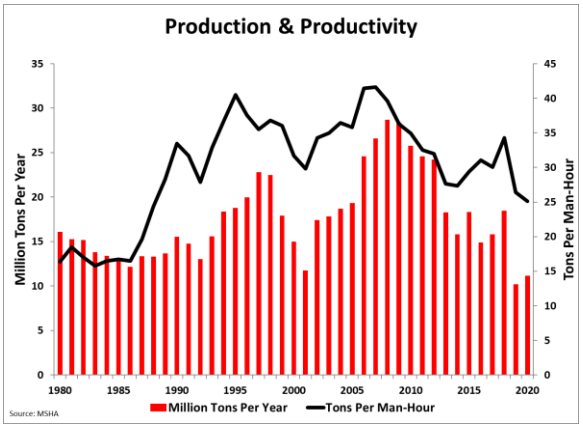
EIA-923 data indicates PSCo has purchased 10.6 MT of coal from the Antelope mine since 2008 with virtually all of it being delivered to the Comanche plant.

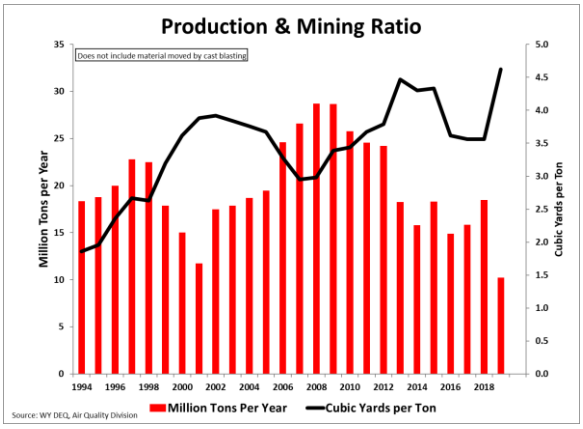
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
ANTELOPE COAL MINE														
Comanche	0.00	366.28	1,403.28	1,443.74	1,417.45	1,343.94	1,371.28	1,605.65	495.64	453.59	453.02	0.00	0.00	10,353.87
Pawnee	0.00	0.00	296.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	296.98
	0.00	366.28	1,700.27	1,443.74	1,417.45	1,343.94	1,371.28	1,605.65	495.64	453.59	453.02	0.00	0.00	10,650.85

Cloud Peak reported 489.7 MT of reserves at the end of 2017. Assuming Antelope continues to produce at 2020 levels, less tons delivered to plants with announced retirement dates between 2018 and 2043, these reserves will keep the mine operating past 2040. Cloud Peak has applied for the pending West Antelope III LBA, with an estimated 441 MT of reserves. If Cloud Peak acquires these reserves, the mine life will be extended past 2050.

Belle Ayr Mine

Having been opened by AMAX in 1972, Belle Ayr is the first of the modern era PRB mines. The mine has changed hands several times and is now owned by ESM. It reached its peak production in 2008 when it produced 28.7 MT. In 2020, production was 11.2 MT. Labor productivity peaked at 41.6 TPMH in 2007 before falling to 25.1 TPMH in 2020. The mining ratio has varied over the years as mining progressed through the mine, peaking at 4.5:1 BCYT in 2013 before increasing to 4.6:1 BCYT in 2020.





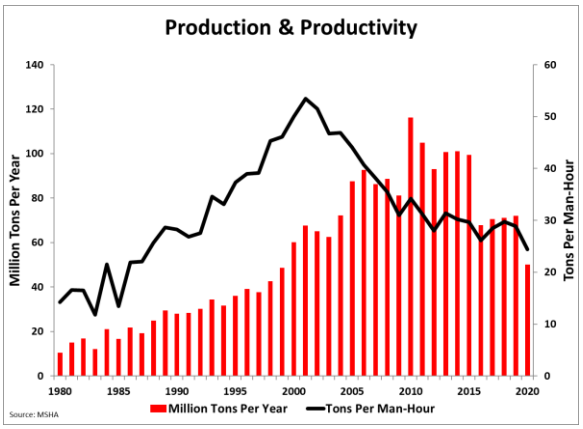
EIA-923 data indicates PSCo has purchased 31.8 MT of coal from the Belle Ayr mine since 2008 with virtually all of it being delivered to the Comanche plant. Deliveries to the Comanche plant were curtailed by outages caused by issues with the turbine and generator in Unit 3 in 2020.

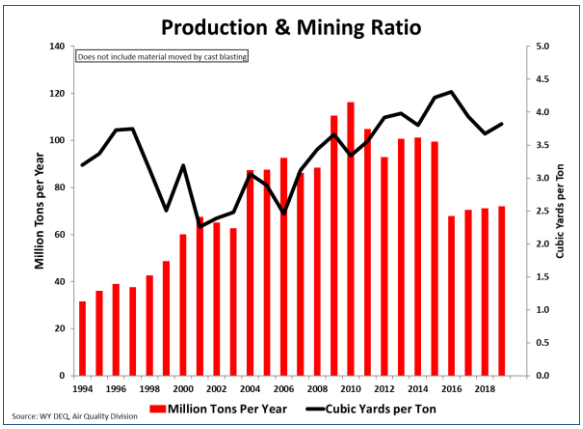
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
BELLE AYR MINE														
Arapahoe	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Comanche	2,602.59	2,889.47	2,346.42	2,530.11	2,645.00	2,472.16	2,542.79	2,318.66	2,911.48	2,851.84	2,595.63	1,609.20	1,101.50	31,416.84
Pawnee	14.64	14.27	0.00	111.38	14.13	14.13	0.00	0.00	0.00	0.00	0.00	0.00	168.87	337.41
	2,617.23	2,903.73	2,346.42	2,641.49	2,659.25	2,486.28	2,542.79	2,318.66	2,911.48	2,851.84	2,595.63	1,609.20	1,270.37	31,754.37

Available data from Contura's last annual report, prior to selling Belle Ayr and Eagle Butte to Blackjewel, indicates Belle Ayr reserves at the end of 2017 were 278.4 MT. Assuming Belle Ayr continues to produce at levels presented in Table 4, these reserves will keep the mine operating past 2040. In 2011, Alpha Natural Resources (an ESM predecessor) applied for the 253 MT, Belle Ayr West LBA. The application was later withdrawn for this tract but may be resubmitted in the future. If applied for and acquired, the reserves in this tract will extend the mine life past 2050.

Black Thunder Mine

The Black Thunder mine was opened by ARCO in 1977 and purchased by Arch in 1998. In addition to expansion of the original Black Thunder mine, the purchase of the adjoining North Rochelle and Jacobs Ranch mine from Triton Coal Co., a Shell Oil subsidiary, and Rio Tinto in 2004 and 2009 respectively, took Black Thunder's production up to 116 MT in 2010, making it the largest coal mine in the world. Production dropped to 99.5 MT in 2015. In 2016 Arch reduced the mine's production to 67.9 MT to, as they described it, "right-size" the mine. Production fell to 50.2 MT in 2020. Labor productivity peaked at 53.4 TPMH in 2001 and dropped to 24.8 TPMH in 2020. Black Thunder's mining ratio has varied over the years with a peak of 3.7:1 BCYT in 1996 and 1997 before falling to 2.3:1 BCYT in 2001. Since then, the ratio has trended upward reaching 4.3:1 BCYT in 2016 and 3.8:1 BCYT in 2020.





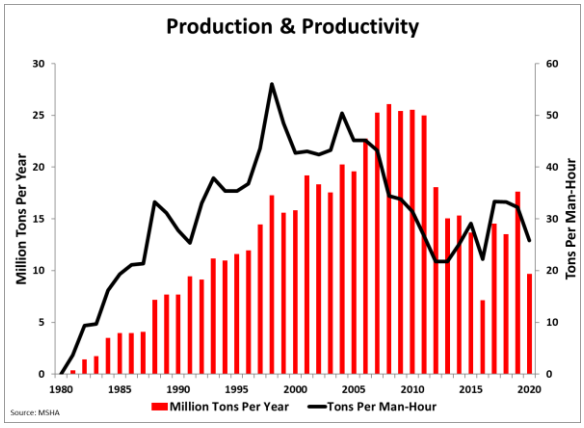
EIA-923 data indicates PSCo has purchased 18.3 MT of coal from the Black Thunder mine since 2008 with virtually all of it being delivered to the Comanche plant since 2014. Deliveries to the Comanche plant were curtailed by outages caused by issues with the turbine and generator in Unit 3 in 2020.

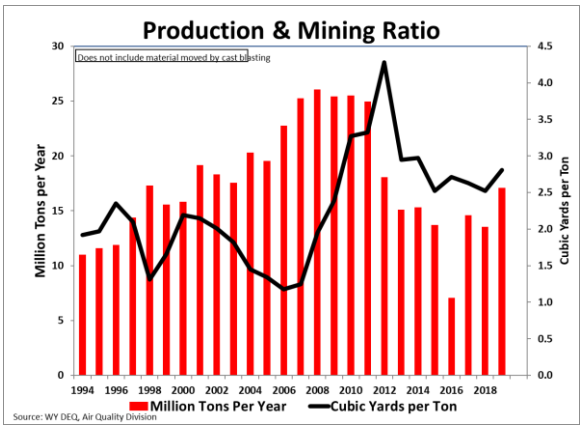
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
BLACK THUNDER														
Arapahoe	600.91	517.01	434.70	421.56	464.69	394.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,833.19
Comanche	0.12	190.15	0.00	648.73	690.12	1,362.72	912.81	1,383.49	1,635.69	1,690.06	2,480.24	2,698.08	1,472.32	15,164.51
Pawnee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	14.09	0.00	0.00	0.00	14.21
Valmont	75.11	197.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	272.12
	676.14	904.17	434.70	1,070.29	1,154.81	1,757.03	912.81	1,383.61	1,635.69	1,704.15	2,480.24	2,698.08	1,472.32	18,284.03

Arch reported Black Thunder's reserves were 698 MT at the end of 2020. Assuming Black Thunder produces at the levels presented in Table 4, these reserves will keep the mine operating until 2036. If Black Thunder acquires the adjacent 468 MT, North Hilight LBA the mine life will be extended past 2050. An additional 969 MT of reserves have been identified in the West Jacobs Ranch tract which was applied for in 2006. The application was withdrawn in 2014 but may be reapplied for if the BLM coal leasing program is resumed.

Buckskin Mine

The Buckskin mine was opened by Triton Coal Company, a Shell Oil subsidiary, in 1980. After passing through several hands, it was purchased, along with the North Rochelle mine and other assets, by Arch in 2004. It was promptly sold to Kiewit. Production peaked at 26.1 MT in 2008. Production fell to 18.1 MT in 2012, as Buckskin mined through a "geologic anomaly", and took another plunge to 7.1 MT in 2016 before recovering to 14.5 MT in 2017. Buckskin production jumped to 17.6 MT in 2019 when Buckskin sold coal to several Blackjewel customers that needed to replace coal lost due to the Belle Ayr and Eagle Butte mine closures. Production fell to 9.7 MT in 2020. Labor productivity peaked at 56.0 TPMH in 1998 and dropped to 21.7 TPMH in 2012 and 2013. By 2017, productivity recovered to 33.4 TPMH before falling to 25.8 in 2020. The mining ratio hit an all-time high of 4.3:1 BCYT in 2012, again, associated with the "geologic anomaly" before dropping to 2.5:1 BCYT in 2015. In 2019, the mining ratio was 2.8:1 BCYT.





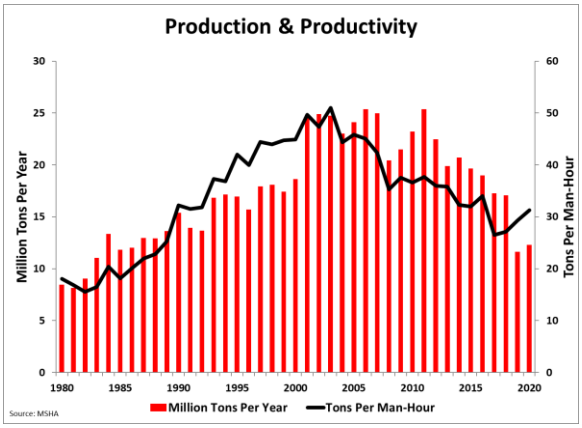
EIA-923 data indicates PSCo has purchased 10.4 MT of coal from the Buckskin mine since 2008 with virtually all of it being delivered to the Pawnee plant.

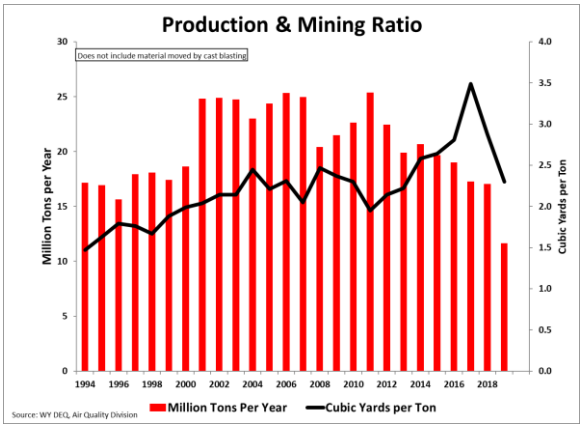
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
BUCKSKIN MINE														
Comanche	0.00	0.00	0.00	0.00	169.07	0.22	0.12	0.12	0.57	0.22	0.00	0.00	0.00	170.31
Pawnee	0.00	0.00	212.21	0.00	931.03	1,123.98	963.96	1,335.51	780.25	1,264.65	1,172.72	1,446.98	977.96	10,209.24
	0.00	0.00	212.21	0.00	1,100.10	1,124.19	964.08	1,335.64	780.82	1,264.86	1,172.72	1,446.98	977.96	10,379.55

Being an employee-owned company, Kiewit does not report reserves at the Buckskin mine. However, analysis of the mine permit application filed with the Wyoming Department of Environmental Quality—Land Quality Division, and actual production over the last several years, Buckskin's reserves have been estimated at 111 MT at the end of 2020. Assuming Buckskin produces at the levels presented in Table 4, these reserves will keep the mine operating until 2031. An additional 148 MT of reserves have been identified in the Hay Creek II tract which was offered for sale in 2006 and resulted in an unsuccessful bid of $0.21/ton. The tract may be reapplied for in the future if the BLM coal leasing program is resumed. If applied for and acquired, the reserves in this tract may extend the mine life past 2040.

Eagle Butte Mine

The Eagle Butte mine was opened by AMAX Coal in 1978. The mine has changed hands several times and is now owned by ESM. Production at Eagle Butte peaked at 25.4 MT in both 2006 and 2011. Production fell to 12.3 MT in 2020. Labor productivity peaked at 51.10 TPMH in 2003 and dropped to 31.3 TPMH in 2020. In 2011, the mining ratio was 2.0:1. By 2017 it had risen to 3.5:1 before falling to 2.3:1 in 2019.





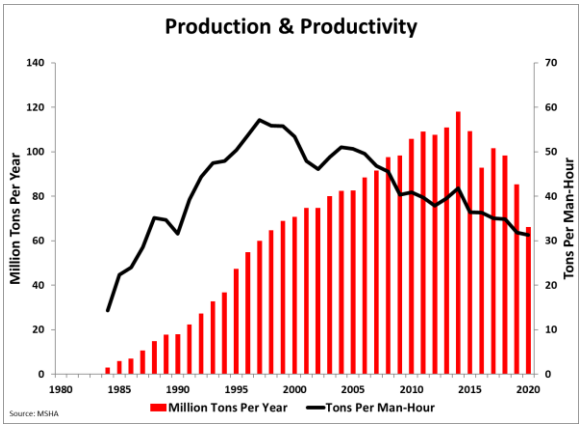
EIA-923 data indicates PSCo has purchased 13.9 MT of coal from the Eagle Butte mine since 2008 with virtually all of it being delivered to the Pawnee plant.

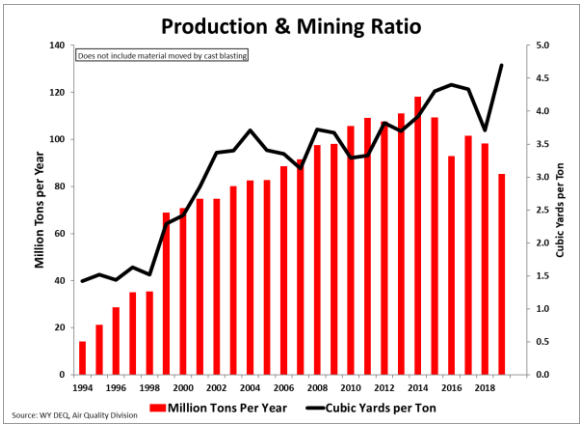
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
EAGLE BUTTE MINE														
Comanche	30.13	0.12	0.24	0.35	0.12	0.11	0.00	0.11	0.12	0.24	0.00	0.00	0.00	31.53
Pawnee	2,173.63	1,100.98	1,614.75	1,625.57	1,068.28	835.28	489.12	1,078.77	963.59	716.82	965.07	291.90	916.52	13,840.28
	2,203.76	1,101.10	1,614.98	1,625.92	1,068.40	835.39	489.12	1,078.88	963.71	717.05	965.07	291.90	916.52	13,871.81

Available data from Contura's last annual report prior to selling Belle Ayr and Eagle Butte to Blackjewel indicates that Eagle Butte's reserves at the end of 2020 were 272 MT. Assuming Eagle Butte continues to produce at levels presented in Table 4, these reserves will be depleted in 2043. Eagle Butte is hemmed in by the Rawhide mine to the north, the Dry Fork mine to the east, and the City of Gillette and its municipal airport on the south. To the west and northwest, it runs into bluffs which will lead to a significant increase in its mining ratio.

North Antelope Rochelle Mine

The NARM mine was originally opened by Peabody as two mines: North Antelope in 1984 and Rochelle in 1985. The mines were eventually merged into a single operation in 1999. In 2005. Peabody leased the West Roundup LBA from the BLM. In 2006, Arch and Peabody exchanged 60 MT blocks of coal with Peabody receiving 60 MT of reserves that Arch had acquired in its purchase of Triton Coal (North Rochelle and Buckskin mines) in 2004. Along with the reserves, Peabody acquired the surface facilities, loadout, now known as NARM-North, and rail associated with Triton's North Rochelle mine. Arch received 60 MT of coal from the West Roundup LBA. Peabody combined the coal reserves and other assets acquired in the exchange with other tracts held by Peabody as the School Creek property. In 2012, the School Creek property was combined with NARM under the same MSHA number. The first production from the property took place in 2013. Production at NARM peaked at 118 MT in 2014 before falling to 92.9 MT and 101.6 MT in 2016 and 2017, respectively. Production fell to 66.1 MT in 2020. Labor productivity peaked at 57.2 TPMH in 1997 and fell to 31.3 TPMH in 2020. In 2000, the mining ratio was 2.4:1 BCYT. By 2020 it had risen to 4.7:1 BCYT.





NARM reports an average coal specification of 8,800 Btu/lb. However, they ship a range of products with a small amount of 8,300 to 8,400 Btu/lb. coal to 9,000 Btu/lb. The coal is shipped through two loadouts: North Antelope Rochelle and NARM North (which ships coal from the School Creek property). It appears that the lower Btu product, less than 8,600 Btu/lb., is mined along the School Creek outcrop and shipped through the NARM North loadout.

PSCo has purchased ~775,000 tons of coal from NARM since 2008. This was a 2017/2018 Comanche test burn of 8,550 Btu coal, shipped out of NARM-N, and a 2019 test burn of 8,800 Btu coal.

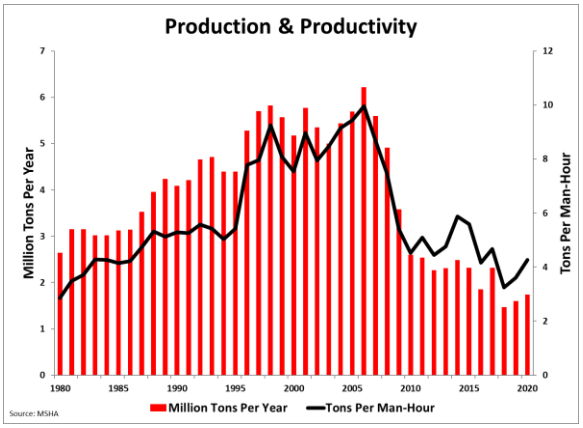
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
NORTH ANTELOPE ROCHELLE MINE														
Comanche	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.20	141.20	605.74	0.00	775.13
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.20	141.20	605.74	0.00	775.13

Peabody reported NARM's reserves were 1,544 MT at the end of 2020. Assuming NARM produces at the levels presented in Table 4, these reserves will keep the mine operating past 2040. An additional 1,001 MT of reserves have been identified in the Antelope Ridge tract which was applied for in 2011 by Peabody. The application was withdrawn in 2015 but can be reapplied for in the future if the BLM coal leasing program is resumed. If applied for and acquired, the reserves in this tract will extend the mine life well past 2050.

Colorado Uinta Basin

Colowyo Mine

The Colowyo mine was originally opened in 1977 by WR Grace. Kennecott, a subsidiary of Rio Tinto, purchased the mine in 1993. In 2006, Kennecott's parent company, Rio Tinto Energy America, eliminated use of the name Kennecott. Rio Tinto sold the mine to Tri-State in 2011. Production at Colowyo peaked at 6.2 MT in 2006. Production fell off to 2.6 MT in 2010 as it lost customers and 100% of its production began going to the Craig Station. In 2015, 2016 and 2017 the mine produced 2.3, 1.9 and 2.3 MT, respectively. Colowyo produced 1.7 MT in 2020. Labor productivity peaked at 10.0 TPMH in 2006 and has fallen to 4.3 TPMH in 2020. Based on mine permit documents, the mining ratio was expected to average 7.2:1 as mining moved into the Collom pit.



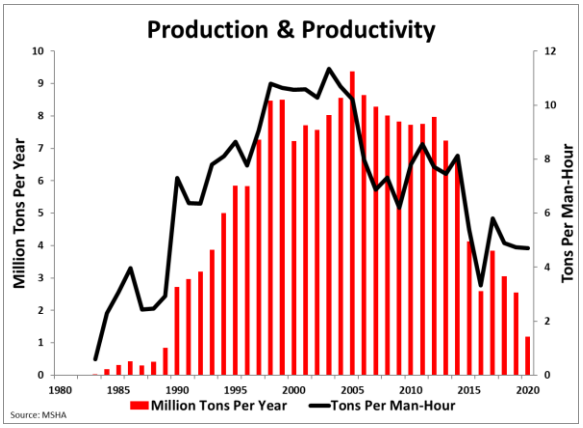
EIA-923 data indicates virtually all Colowyo's coal has gone to the Craig station since 2010. Tri-State owns 24% of units 1 and 2 at the Craig Station and 100% of unit 3. PSCo owns 9.7% of units 1 and 2 and all PSCo's coal supply for the Craig Station comes from the Colowyo mine in recent years.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
COLOWYO MINE														
Public Service Co of Colorado														
Cherokee	11.19	106.15												117.34
Tri-State G & T Assn, Inc														
Craig	2,590.82	3,166.11	2,576.23	2,340.47	2,295.43	2,170.88	2,375.22	2,357.85	2,177.32	1,919.76	1,206.50	1,711.76	1,703.05	28,591.40
	2,602.01	3,272.26	2,576.23	2,340.47	2,295.43	2,170.88	2,375.22	2,357.85	2,177.32	1,919.76	1,206.50	1,711.76	1,703.05	28,708.74

Colowyo recently developed the Collom coal leases as they completed mining in their South Taylor pit which is now closed. Reserves in the Collom coal leases are estimated at 89 MT. South Taylor and Collom are part of a larger Logical Mining Unit containing 246 MT (including underground reserves). At a production rate of 2 MTY, the Collom leases have a remaining reserve life of over 40 years. Units 1 and 2 at the Craig Station will be retired by 2025 and 2028, respectively, and Unit 3 will be retired by 2030.

Foidel Creek/Twentymile

The Foidel Creek Mine (commonly referred to as Twentymile) is an underground, longwall mine that was opened in 1983 and purchased by Peabody in 2004. The mine's production peaked at 9.4 MT in 2005 and has since fallen as low as 1.2 MT in 2020. Labor productivity peaked at 11.3 TPMH in 2003, making it one of the largest and most productive underground mines in the country at that time. Since 2003, productivity has dropped as low as 3.3 TPMH in 2016 before rebounding to 5.8 TPMH in 2017. Productivity was 4.7 TPMH in 2020. Historically, the Foidel Creek mine produced coal in the Wadge seam. In 2015, work began to develop the lower Wolf Creek seam while mining in the Wadge Seam was completed. In 2016, the mine began producing in the Wolf Creek seam. The rebound in productivity in 2017 marks the completion of the move from the Wadge seam to the Wolf Creek seam.



EIA-923 data shows many customers Foidel Creek has had over the years. In addition to the customers reported on the EIA-923, Foidel Creek has served industrial markets and the export market. Over the last three years, as the mine's production has fallen, PSCo plants have taken the bulk of the tons reported in the EIA-923 report with the Hayden power plant being the largest single buyer. PSCo is the majority owner and operator of the Hayden Generating Station, owning about 75% of Unit 1 and 37.5% of Unit 2.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
	(1,000 tons)													
FOIDEL CREEK MINE														
Cherokee	1,414.93	1,563.38	1,142.48	1,571.14	1,432.50	1,227.62	1,460.53	965.47	741.12	436.48	0.00	0.00	0.00	11,955.64
Hayden	1,702.57	1,491.35	1,588.55	1,488.18	1,192.26	1,320.71	1,509.39	1,404.50	1,104.83	1,340.69	1,106.08	1,235.99	1,138.78	17,623.87
Valmont	285.09	195.06	272.54	147.90	165.92	244.52	229.91	450.69	393.17	55.23	0.00	0.00	0.00	2,440.02
	3,402.58	3,249.79	3,003.58	3,207.22	2,790.68	2,792.85	3,199.82	2,820.66	2,239.12	1,832.39	1,106.08	1,235.99	1,138.78	32,019.54

Peabody's 2020 Annual Report indicates 4 MT of reserves at the Twentymile mining complex at the end of 2019, down from 28 MT at the end of 2018. In May 2019, Peabody suspended work on an LBA for the Foidel Creek mine which would have added an estimated 4.68 million tons to the mine's reserves. At current production rates, Foidel Creek's reserves will be depleted in about three years. Peabody has a large additional reserve in the vicinity of the Foidel Creek mine, the Sage Creek mine. The Sage Creek mine has reported reserves of 105 MT and initial mine development work has been completed. With PSCo's announced plans to retire Hayden Unit 1 by 2027 and Unit 2 by 2028,[4] it is unlikely Peabody will invest in additional work developing these reserves unless other market opportunities appear for the mine.

[4] Xcel Energy - Xcel Energy announces retirement of Hayden power plant

Risk Factors

Bankruptcies

Five PRB producers have gone through bankruptcy proceedings: Arch (2015-2016), Alpha (2015-2016), Peabody (2016-2017), Blackjewel (2019) and Cloud Peak (2019). In three cases (Arch, Peabody and Alpha) the bankruptcy was brought on by excess debt triggered by investment in the metallurgical coal business when the price of metallurgical coal spiked to historically high prices. When the sales price and demand for metallurgical coal dropped along with the overall demand for coal, the companies were saddled with debt they could not service. The Cloud Peak bankruptcy was triggered by a series of adverse events including nesting golden eagles, severe thunderstorms, investments in Young's Creek and the Crow leases, and falling prices for exported thermal coal.

Arch exited bankruptcy in October 2016 with long-term debt reduced by $4.5 billion. In 2019, Arch reported a profit of $233.8. million and an EBITDA of $363.2 million. In 2020, Arch reported a loss of -$344.6 million and an EBITDA of $23.7 million. Arch is now restructuring the company through a phased strategic pivot away from its thermal assets to its steel and metallurgical assets.

After emerging from bankruptcy in 2017 Peabody's debt was reduced by over $5 billion. Peabody reported a net income of $693 million from April 2 through December 31, 2017 and an EBITDA of $1,145.3 million for the same period. In 2019 Peabody reported a loss of -$185.1 million and an EBITDA of $883.0 followed by a loss of -$1,873.8 and an EBITDA of $258.8 in 2020. $1,418.1 million of the 2020 loss is attributed to a non-cash asset impairment charge related to the North Antelope Rochelle mine.

In July 2016, Contura Energy was formed by the creditors of ANR to manage the core metallurgical and thermal coal assets, including ANR's PRB mines, in connection with its restructuring. Contura emerged from bankruptcy in June 2016 and began trading on the Over-The-Counter market (CNTE) in August 2017. In December 2017, Contura transferred the Belle Ayr and Eagle Butte mines to Blackjewel LLC, paying Blackjewel $21 million to take over the mines and assume reclamation and other liabilities. Blackjewel was privately held and financial data is not available for this company.

Blackjewel filed for bankruptcy in July 2019. The mines were sold to ESM in October 2019. ESM is a privately controlled LLC and financial data is not available for this company.

In November 2019, Cloud Peak's mines were sold to NTEC for $15.7 million in cash plus a promissory note for $40 million. NTEC is an LLC owned by the Navajo Nation and financial data is not available for this company

Except for the Belle Ayr and Eagle Butte mines which were idled by Blackjewel, all the PRB mines owned by these companies continued to operate without interruption during bankruptcy and both mines returned to production after bankruptcy.

Alternate Coal Sources

This analysis has focused on current reserves, reserves in pending LBAs, and other identified reserves associated with each of the mines operating in the PRB with a focus on mines currently selling coal to PSCo. The analysis has made certain assumptions regarding future production for each of the mines. The primary assumption is that there will be no power plant retirements other than those listed in Table 1. This is a conservative assumption because it does not consider the possibility of additional plant retirements which would extend the life of current reserves.

A review of Table 4 shows that Black Thunder and Buckskin will require additional reserves in 2036 and 2031, respectively. In 2020, these two mines supplied 2.5 MT to PSCo with 1.5 MT going to Comanche and 1.0 MT going to Pawnee. Additional reserves have been identified but will have to be acquired for

these mines to continue producing past the listed dates. If the additional reserves are acquired, these mines will continue to operate past 2040.

If Black Thunder and Buckskin reserves are depleted earlier than projected, PSCo will have to look to other mines in the PRB to supply Comanche and Pawnee for their remaining operating years. However, this may not be an issue as according to PSCo's February 2021 Clean Energy Plan announcement,[5] Pawnee is scheduled to be converted to natural gas by 2028 and Comanche's Unit 3 is scheduled to be retired in 2040 but with a significant reduction in operating hours after 2030. In 2020, Comanche and Pawnee collectively received 4.6 MT. The most likely alternate sources for this coal are the NARM, Antelope, Belle Ayr, Caballo and Cordero Rojo mines.

In Colorado, there are two jointly owned plants supplied by the Colowyo, Trapper and Foidel Creek/Twentymile mines. These mines supplied the Hayden and Craig power plants with 4.5 MT in 2020. All units at these plants, at which PSCo has an ownership share, are scheduled to be retired by the end of 2028, except for Craig Unit 3 which is scheduled to operate until 2030. Colowyo and Trapper are the main suppliers to Craig but Foidel Creek/Twentymile has been burned at Craig as well. The Colowyo mine becomes the most likely alternate supplier of the Hayden plant if the Foidel Creek/Twentymile mine is not able to supply the plants' fuel requirements. Arch's West Elk coal has been burned at Hayden and is another possible supplier.

[5] Our Energy Future (xcelenergy.com)

Conclusions

Powder River Basin

US and PRB coal production peaked in 2008 when 1,172 MT were produced in the US and 451.7 MT were produced in the PRB. By 2020, production had fallen to 524 MT nationwide and 210 MT in the PRB due to the financial crash of 2008, the success of fracking in producing low-cost gas, state mandated renewable energy portfolios, and tax credits given to wind and solar energy projects, all of which resulted in the retirement of a number of power plants. Additional plant retirements have been announced that are expected to reduce PRB production to 161 MT by 2040. As coal burning units are retired, mine lives are extended because of the decreased demand.

In 2020, PSCo purchased 4.6 MT from four of the 12 PRB mines. These mines produced 83.4 MT in 2020, with production expected to fall to 60.9 MT in 2040. In 2035, when most of PSCo's coal fired units are expected to be retired, these mines are expected to produce 66.0 MT. Mines that produced coal for PSCo in 2020 currently hold reserves of 1,319 MT and have access to an additional 1,297 MT of identified but unleased coal. At projected production rates, the four mines currently supplying PSCo will deplete their currently held reserves in 11 to over 20 years. With the acquisition of additional identified reserves, the mine lives will be extended another 20 years.

In addition to the four mines that supplied PSCo in 2020, there are five additional mines that are potential suppliers for PSCo. These mines produced 116.8 MT in 2020 and are projected to produce 92.7 MT in 2040. They currently hold 1,150 MT of reserves and have access to an additional 2,741 MT of identified reserves. Beyond the specific reserves identified in this analysis, there are additional reserves in the PRB, as identified in the USGS *Coal Geology and Assessment of Coal Resources and Reserves in the Gillette Coal Field, Powder River Basin, Wyoming* published in 2015, that can extend coal production in the PRB by more than 80 years.

While all the major PRB producers have gone through bankruptcy, two have emerged from bankruptcy and continue to operate their mines and NTEC continues to operate the Cloud Peak mines. Belle Ayr and Eagle Butte continue to operate despite going through two bankruptcies. Except for the Blackjewel bankruptcy, all mines continued to operate while in bankruptcy and no shipments were missed.

Based on current production costs and the historic trends in stripping costs in the PRB, coal prices should remain competitive in the foreseeable future.

The railroads serving the PRB have made significant investments in the rail transportation infrastructure and have sufficient capacity to meet expected demand. Rail rates in recent rail transportation contract renewals in other regions have trended downward, lowering coal unit dispatch pricing.

Colorado

The Hayden and Craig power plants purchased 4.5 MT of coal from three Colorado mines in 2020. The three mines currently supplying the plants are Colowyo, Foidel Creek/Twentymile and Trapper. These mines produced a total of 5.0 MT in 2020. Trapper is captive to the Craig plant while Colowyo and Foidel Creek/Twentymile both have rail access to the Craig and Hayden plants. Reserves at Colowyo and Foidel Creek/Twentymile are 94 MT which is adequate to supply the two power plants for 25 years. In addition to the reserves at the two producing mines, Peabody has done mine development work on the Sage Creek project, near the Foidel Creek/Twentymile mine. Reserves at the Sage Creek project may exceed 100 MT. Additional coal may also be available from the West Elk mine in Colorado.

Table 4 – PRB Reserve Depletion

Table 4 - PRB Reserve Depletion

	Market Share	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Arch Resources																						
Black Thunder																						
2017 Production		50.2	48.0	48.0	47.2	46.1	45.0	44.2	43.4	42.7	41.1	39.9	39.5	37.9	37.9	37.9	37.9	37.9	36.8	33.9	33.3	33.3
Plant Retirements																						
Allen S King	0.8	0.3									0.3											
Clay Boswell		1.4																				
Comanche (CO)	0.6	1.5			0.3			0.4										0.8				
Coronado	0.2	0.5			0.1			0.1										0.3				
Dan E Karn	0.6	0.5				0.5																
Eckert Station		0.0																				
Edgewater	0.1	0.1			0.1																	
Genoa	1.0	0.5		0.5																		
Harrington	0.2	0.4						0.4														
Labadie	0.6	6.1																	2.9			
Limestone	0.2	0.9											0.9									
Michigan City	1.0	0.8									0.8											
Prairie Creek	0.2	0.0						0.0														
R M Schahfer	0.4	0.3		0.3																		
Ray D Nixon	0.5	0.4										0.4										
Rush Island	0.0	0.0																				
Sherburne County	0.8	2.1				0.7			0.7				0.8									
Sioux	0.1	0.1									0.1											
South Oak Creek	0.4	0.7					0.7															
Tolk	0.5	0.5																		0.5		
Trenton Channel	0.8	0.1			0.1																	
W A Parish	0.3	2.1																				
Plant Retirements Transferred From Coal Creek																						
Dave Johnson	0.5	1.6								1.6												
Edgewater	0.6	0.4			0.4																	
W A Parish	0.1	0.3																				
Future Production		50.2	48.0	47.2	46.1	45.0	44.2	43.4	42.7	41.1	39.9	39.5	37.9	37.9	37.9	37.9	37.9	36.8	33.9	33.3	33.3	33.3
Reserves (EOY)		698.0	650.0	602.0	554.8	508.6	463.7	419.4	376.1	333.4	292.2	252.3	212.8	174.9	137.1	99.2	61.4	491.1	454.3	420.4	387.1	353.7
Reserve Additions		West Jacobs Ranch-956 mmt																North Hilight LBA-467.6 mmt				
Coal Creek - Transfer market and retirements to Black Thunder																						
Production		2.1	2.0																			
Plant Retirements																						
Dave Johnson	0.5	1.6																				
Edgewater	0.6	0.4																				
W A Parish	0.1	0.3																				
Future Production		2.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reserves (EOY)		90.0	Reserves Abandoned																			
Reserve Additions		West Coal Creek-57 mmt																				

Table 4 - PRB Reserve Depletion

	Market Share	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Eagle Specialty Materials																						
Belle Ayr																						
Production		11.2	11.2	11.2	10.3	10.1	10.1	10.1	9.5	9.5	9.5	9.3	9.3	9.3	9.3	9.3	9.3	9.3	8.7	8.7	8.7	8.7
Plant Retirements																						
Baldwin Energy Complex	0.1	0.2						0.2														
Boardman	1.0	0.6		0.6																		
Burlington (IA)	0.4	0.3		0.3																		
Comanche (CO)	0.4	1.1			0.3			0.3										0.6				
Newton	0.0	0.0								0.0												
Pawnee	0.1	0.2									0.2											
Prairie Creek	0.2	0.1						0.0														
Rush Island	0.3	1.3																				1.3
Sioux	0.0	0.0									0.0											
Future Production		11.2	11.2	10.3	10.1	10.1	10.1	9.5	9.5	9.5	9.3	9.3	9.3	9.3	9.3	9.3	9.3	8.7	8.7	8.7	8.7	7.4
Reserves (EOY)		238.0	226.8	215.7	205.3	195.3	185.2	175.2	165.7	156.1	146.6	137.3	128.0	118.7	109.4	100.1	90.8	81.6	72.8	64.1	55.4	46.7
Reserve Additions		Belle Ayr West-253 mmt																				
Eagle Butte																						
Production		12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.2	12.2	12.2	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Plant Retirements																						
Baldwin Energy Complex	0.0	0.1						0.1														
Newton	0.0	0.0								0.0												
Pawnee	0.4	0.9									0.9											
Future Production		12.3	12.3	12.3	12.3	12.3	12.3	12.2	12.2	12.2	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Reserves (EOY)		272.0	259.7	247.4	235.1	222.8	210.5	198.2	185.9	173.7	161.5	150.2	138.9	127.6	116.2	104.9	93.6	82.3	71.0	59.7	48.4	37.0
Reserve Additions																						
Kiewit																						
Buckskin																						
Production		9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.3	9.3	9.3	8.3	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Plant Retirements																						
Baldwin Energy Complex	0.1	0.4						0.4														
Limestone	0.2	0.8											0.8									
Newton	0.0	0.0								0.0												
Pawnee	0.5	1.0									1.0											
W A Parish	0.4	2.6																				
Future Production		9.7	9.7	9.7	9.7	9.7	9.7	9.3	9.3	9.3	8.3	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Reserves (EOY)		111.0	101.3	91.6	81.9	72.2	62.5	52.8	43.5	34.1	24.8	16.5	156.2	148.7	141.2	133.7	126.2	118.7	111.3	103.8	96.3	88.8
Reserve Additions													Hay Creek II-148 mmt									

Table 4 - PRB Reserve Depletion

	Market Share	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Navajo Transitional Energy Company																						
Antelope																						
Production		19.8	19.8	19.8	19.8	19.8	19.8	19.6	19.5	19.5	19.2	18.2	18.2	17.1	17.1	16.1	16.1	16.1	16.1	15.4	15.4	15.4
Plant Retirements																						
Clay Boswell	0.2	0.2																				
Coronado	0.7	1.1													1.1							
Joppa Steam	0.0	0.0						0.0														
Labadie	0.1	1.3																	0.6			
Newton	0.2	0.4								0.4												
Prairie Creek	0.6	0.2						0.1														
Rawhide	1.0	1.0											1.0									
Rush Island	0.4	1.5																				1.5
Sioux	0.8	1.0									1.0											
South Oak Creek	0.1	0.2					0.2															
Trenton Channel	0.3	0.0			0.0																	
Future Production		19.8	19.8	19.8	19.8	19.8	19.6	19.5	19.5	19.2	18.2	18.2	17.1	17.1	16.1	16.1	16.1	16.1	15.4	15.4	15.4	13.9
Reserves (EOY)		429.0	409.2	389.4	369.6	349.8	330.0	310.4	290.9	271.4	252.2	234.1	215.9	198.8	181.7	165.6	149.6	133.5	117.5	102.0	86.6	71.1
Reserve Additions		West Antelope 3-441 mmt																				
Cordero																						
Production		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Plant Retirements																						
Future Production		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Reserves (EOY)		264.0	254.2	244.5	234.7	224.9	215.1	205.4	195.6	185.8	176.0	166.3	156.5	146.7	136.9	127.2	117.4	107.6	97.8	88.1	78.3	68.5
Peabody																						
Caballo																						
Production		11.6	11.6	11.6	11.6	11.6	11.6	11.6	10.7	10.7	10.4	10.4	10.4	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Plant Retirements																						
Baldwin Energy Complex	0.2	0.9						0.9														
Dave Johnston	0.1	0.4								0.4												
Limestone	0.0	0.1											0.1									
W A Parish	0.1	0.5																				
Future Production		11.6	11.6	11.6	11.6	11.6	11.6	10.7	10.7	10.4	10.4	10.4	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Reserves (EOY)		435.0	423.4	411.8	400.2	388.6	377.0	365.4	354.7	343.9	333.5	323.2	312.8	302.5	292.2	281.9	271.6	261.3	251.0	240.8	230.5	220.2
Reserve Additions																						

Table 4 - PRB Reserve Depletion

	Market Share	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Peabody Continued																						
NARM																						
Production		66.1	66.1	66.1	65.1	62.9	62.2	61.3	54.4	54.2	50.8	50.6	50.2	50.0	50.0	49.8	49.8	49.8	49.8	48.7	48.1	48.1
Plant Retirements																						
Allen S King	0.2	0.4									0.1											
Baldwin Energy Complex	0.8	2.9						2.9														
Burlington (IA)	0.6	0.4		0.4																		
Clay Boswell	0.3	0.4																				
Coronado	0.1	0.2													0.2							
Dan E Karn	0.5	0.4				0.4																
Dave Johnston	0.4	1.0								1.0												
E D Edwards	1.0	1.9			1.9																	
Edgewater	0.3	0.2			0.2																	
Harrington	0.8	1.4						1.4														
Joppa Steam	1.0	2.6						2.6														
Kincaid Generation LLC	1.0	1.0								1.0												
Labadie	0.2	2.3																	1.1			
Martin Drake	1.0	0.1			0.1																	
Newton	0.8	1.4								1.4												
Oklaunion	1.0	0.5		0.5																		
R M Schahfer	0.6	0.6		0.1																		
Ray D Nixon	0.5	0.4										0.4										
Rush Island	0.3	1.0																				1.0
Sherburne County	0.3	0.7				0.2			0.2				0.3									
Sioux	0.1	0.1									0.1											
South Oak Creek	0.5	0.8					0.8															
Tolk	0.5	0.5																		0.5		
Will County	1.0	0.1					0.1															
Future Production	-13.5	66.1	66.1	65.1	62.9	62.2	61.3	54.4	54.2	50.8	50.6	50.2	50.0	50.0	49.8	49.8	49.8	49.8	48.7	48.1	48.1	47.2
Reserves (EOY)		1,544.0	1,477.9	1,411.8	1,346.7	1,283.8	1,221.6	1,160.3	1,105.9	1,051.7	1,000.9	950.3	900.1	850.1	800.2	750.4	700.6	650.8	601.0	552.3	504.1	456.0
Reserve Additions	Antelope Ridge - 1001 mmt																					
Rawhide																						
Production		9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Plant Retirements																						
Limestone	0.5	2.0											2.0									
Newton	0.0	0.0								0.0												
Transalta Centralia Generation	1.0	1.5						1.5														
Future Production		9.5	9.5	9.5	9.5	9.5	9.5	7.9	9.5	9.5	9.5	9.5	7.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Reserves (EOY)		191.0	181.5	172.0	162.5	153.0	143.5	134.0	124.5	115.0	105.6	96.1	86.6	77.1	67.6	58.1	48.6	39.1	29.6	20.1	10.6	1.1
Reserve Additions																						

Table 4 - PRB Reserve Depletion

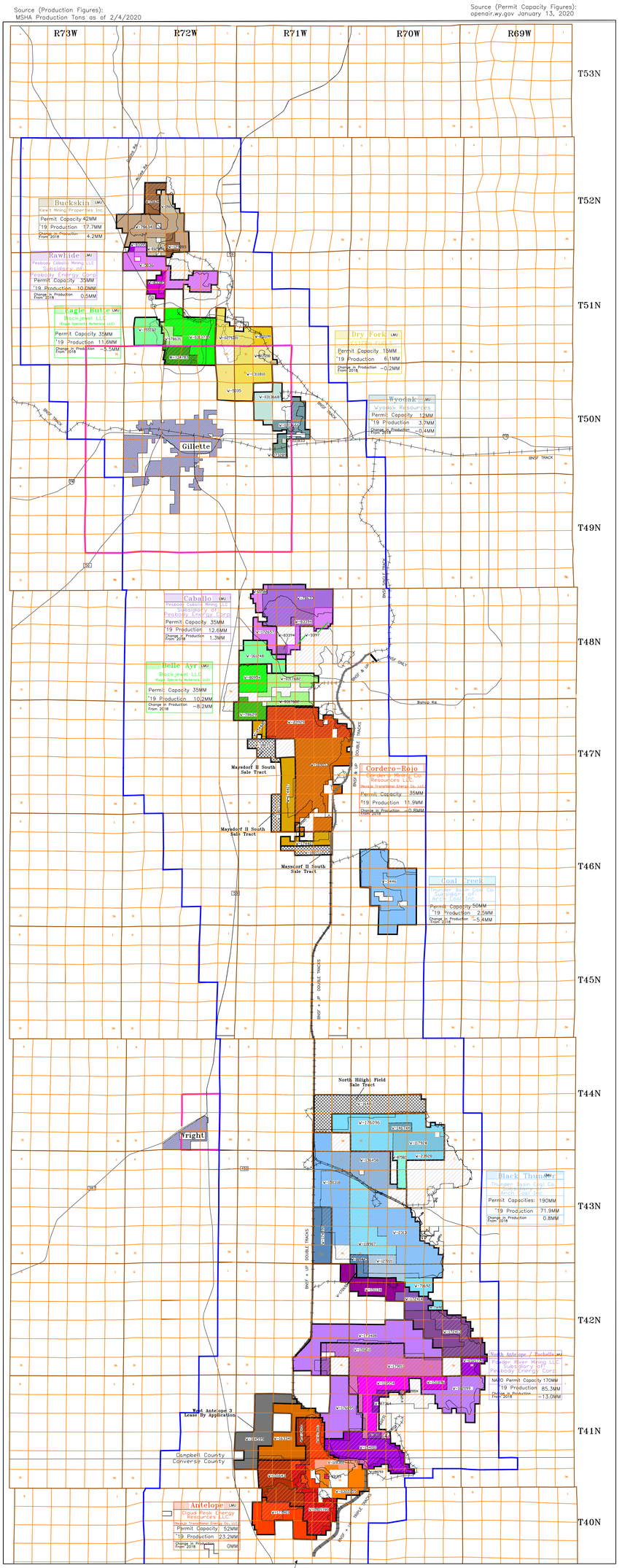
	Market Share	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Western Energy																						
Dry Fork																						
Production		3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Reserves (EOY)		224.0	220.1	216.2	212.2	208.3	204.4	200.5	196.5	192.6	188.7	184.8	180.8	176.9	173.0	169.1	165.1	161.2	157.3	153.4	149.4	145.5
Reserve Additions																						
Black Hills Energy																						
Wyodak																						
Production		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Reserves (EOY)		183.0	179.3	175.5	171.8	168.1	164.3	160.6	156.8	153.1	149.4	145.6	141.9	138.2	134.4	130.7	126.9	123.2	119.5	115.7	112.0	108.3
Reserve Additions																						
Total Production		210.0	207.6	205.6	203.0	199.4	197.5	195.7	186.1	185.2	179.4	175.0	174.2	170.2	170.2	169.0	169.0	169.0	167.4	162.8	161.7	161.7
Total Reserves		4,679.0	4,383.4	4,177.7	3,974.8	3,775.4	3,577.9	3,382.2	3,196.1	3,010.9	2,831.5	2,656.5	2,630.4	2,460.1	2,289.9	2,120.9	1,951.9	2,250.5	2,083.1	1,920.3	1,758.7	1,597.0

Wyoming Powder River Basin Federal Coal Lease Status

2019 Tons Produced = 266.7 million tons (down 9.1% (26.4 MM tons) from 2018)

Source (Production Figures):
MSHA Production Tons as of 2/4/2020

Source (Permit Capacity Figures):
opendnr.wy.gov January 13, 2020



Coordinate data above is accurate to varying degrees – UTM meters NAD'27

Landlines = WY CADNSDI V2 Rail = Digitized from 71/2 min quads. Roads = GPS
Leases = GCDB, I-90 = digitized 7/12 min quad, cities = digitized 71/2 min quads

Legend

- BLM Coal Lease
- Lease By Application
- Coal Lease Sale Tract
- Lease Mod
- State Coal Lease (selected leases)
- Mine has a Logical Mining Unit
- Coal Developement Potential Buffalo as 2015 ammended & Casper 2007 RMP
- Town Buffers Buffalo 2015 RMP
- 59 State Highway
- BNSF Burlington Northern/Sante Fe R.R.
- UP Union Pacific
- Approx. Mined Out/Depleted Areas

*Affected Area displayed for Black Thunder
**Coal Creek Mined Out Area not updated

SCALE
1 0 0.5 1 2 4
Miles

This map is meant for orientation only

NO WARRANTY IS MADE BY THE BUREAU OF LAND MANAGEMENT AS TO THE ACCURACY, RELIABILITY, COMPLETENESS OF THESE DATA FOR INDIVIDUAL USE OR AGGREGATE USE WITH OTHER DATA.

Electronic copies of this map are available at:
http://www.wy.blm.gov/minerals/coal/prb/prb_maps.htm
The filename is PRB_Coal_Lease_Status_Map.dwg and .dxf

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Solid Minerals Group Casper, Wyoming

Federal Coal Lease Status

Created 1/8/01 Updated: 2/4/2020

UTM METERS–NAD27 plot 33.175000 file: SCoal-Gen\PRB coal lease Map\prb-map16_utm.dwg

Landlines are from several sources and include digitized and PLSS data and may not match due to resurveys, etc.

Powder River Basin Production Area