

WYOMING COAL

September 2018 Concise Guide



WYOMING MINING
ASSOCIATION

wyomingmining.org

The Concise Guide is an educational effort to raise awareness of the economic contribution and value of Wyoming's coal industry.

The Concise Guide to Wyoming Coal is produced by the Wyoming Coal Information Committee of the Wyoming Mining Association. Cheyenne, Wyoming, September 2018.

A CULTURE OF SAFETY

Safety is a core cultural value for Wyoming's coal mining industry, and Wyoming coal mines are recognized as some of the safest mining operations in the nation. Safe mines are productive mines, and the Wyoming coal industry is committed to providing a safe working environment for all employees and contractors.

All Wyoming coal mines employ dedicated safety professionals, and all employees are trained in proper safety practices to foster a safe work environment and build and maintain the culture of safety.

- All new employees attend 40 hours of safety training prior to their first day on the job.
- All employees participate regularly in safety refresher training.
- Every shift starts with safety briefings and walk-around inspections.
- Employees earn safety bonuses to encourage safe and vigilant work practices.
- The Mine Safety and Health Administration monitors all Wyoming mines.

WYOMING COAL INDUSTRY IN 2018

Wyoming's coal industry continues to operate in an environment of long-term structural change. Strong competition with low natural gas prices and new "combined-cycle" natural gas generation capacity coming online across the country has continued to weaken coal's market share. Coal consumption in the United States peaked in 2005 and has since declined 40 percent. Conversely, natural gas consumption grew 24 percent between 2005 and 2017. Increased competition from heavily subsidized renewables, restrictive regulation and state energy portfolio mandates also play a role.

Despite near-term uncertainties, coal continues to offer a secure, abundant and affordable source of fuel and remains a significant source of energy, generating slightly more than 30 percent of the nation's electricity in 2017. The Energy Information Administration estimates that coal will still play a significant role in the nation's electricity generation as far out as 2050. This is largely due to coal's role as a low-cost fuel source for power generating facilities with long operating life spans.

Wyoming has led the nation in coal production since 1986, and

Wyoming's mines, operating leaner and more efficient than ever, remain America's low-cost industry leaders. Home to seven of the nation's top 10 producing mines, Wyoming provides about 40 percent of all coal used for electricity production in the nation. That translates to about 12 percent of U.S. domestic electric power generation. In total, Wyoming produced over 316 million tons of coal in 2017, up 6.4 percent from 2016.

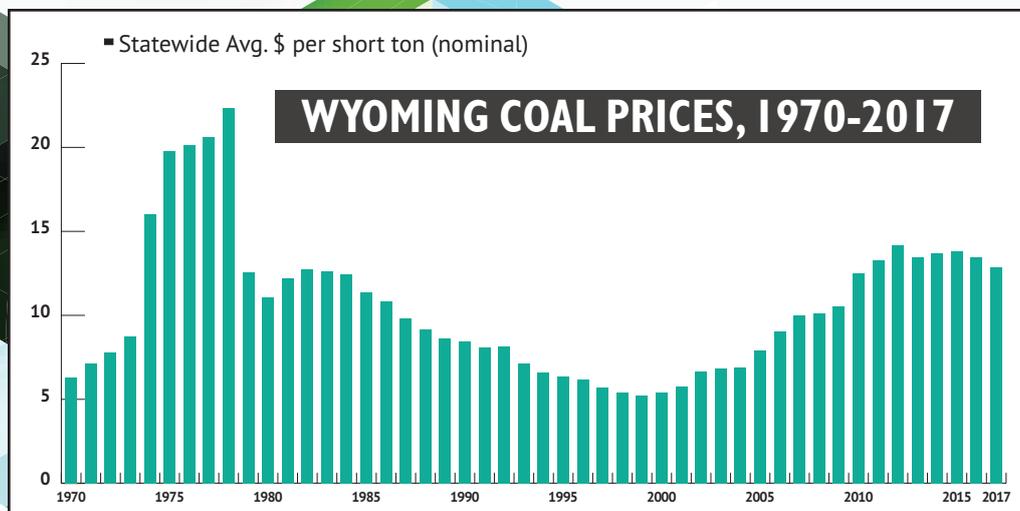
WYOMING'S COAL RESOURCES

Wyoming is home to over 1.4 trillion tons of total coal resources in seams ranging in thickness from 5 feet to some in excess of 200 feet in the Powder River Basin (PRB). Recent estimates from the Wyoming Geological Survey give Wyoming more than 165 billion tons of recoverable coal. While other regions of the country also hold considerable resources, Wyoming's position as the nation's pre-eminent coal producer is attributed to several factors:

- Low sulfur composition of the coal.
- Lower production costs due to the coal's proximity to the surface.
- World-class recoverable coal seams.
- Hyper-efficient rail infrastructure.

During 2017, 288 million tons of coal moved by unit trains (single destination trains with up to 150 cars) to energy markets in 27 states across the country. Wyoming power plants consumed another 26 million tons during the year, and 2 million tons went to other uses. On average, coal is mined at the staggering rate of 10 tons per second. Up to 60 unit trains leave the PRB daily. Rather than stopping, trains are loaded as they move through the loading chute at speeds up to two mph. It takes less than one minute to load a train car and about ninety minutes to load a unit train.

The average price for Wyoming coal in 2017 was \$13.35 per ton, down 12 cents per ton from 2016. While most newly constructed power plants are designed to operate on natural gas, coal will continue to provide a significant portion of "baseload" generating capacity for the foreseeable future. Fuel switching, or changing between natural gas and coal for power, is limited as many existing plants are either not designed to operate on natural gas or they do not currently have a pipeline to deliver the quantity of gas needed for operations.



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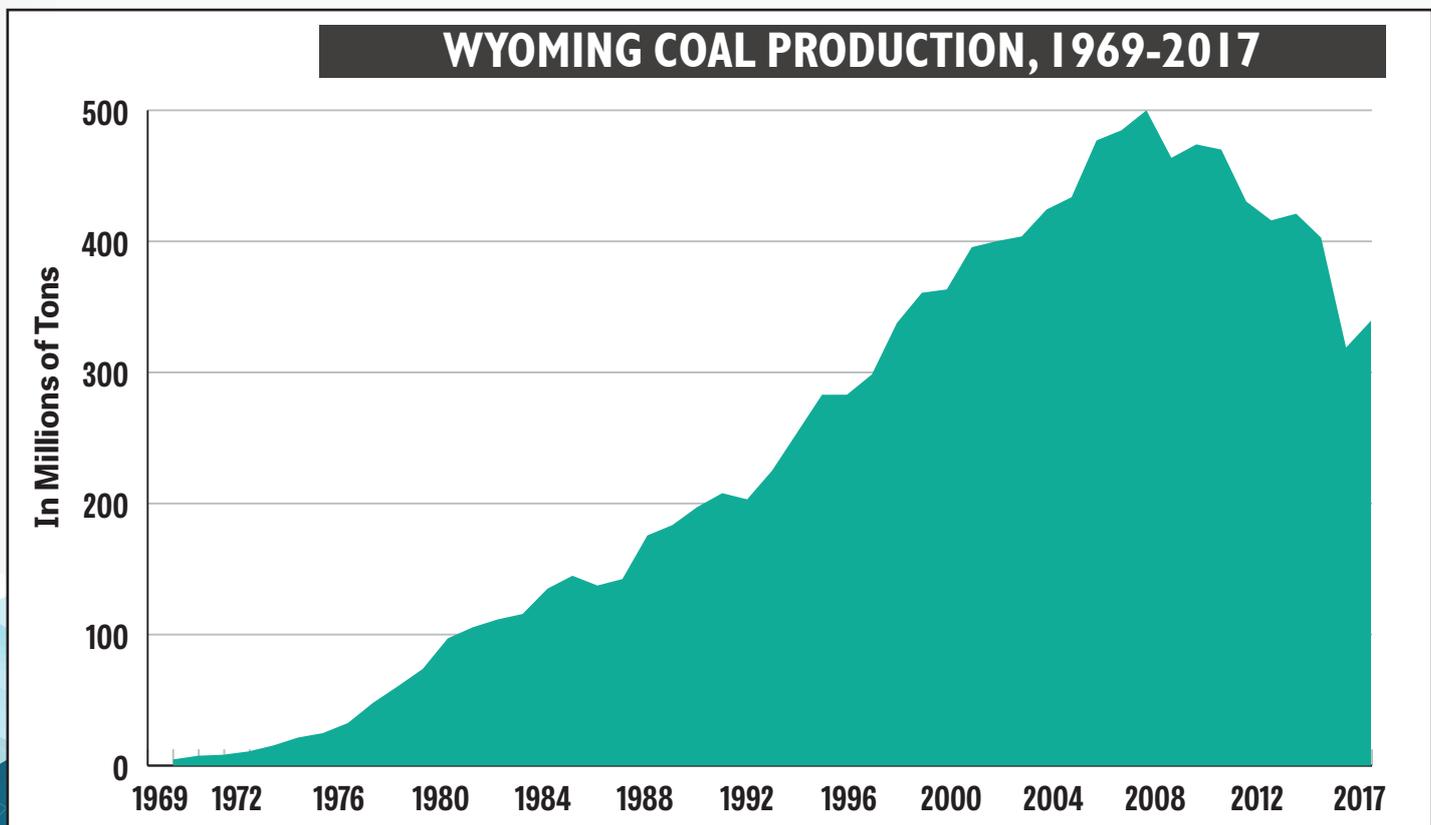
Home to **7** of the nation's **TOP 10** producing mines, Wyoming provides about **40%** of **ALL COAL USED** for electricity production in the nation.

OUTLOOK FOR THE FUTURE

Coal is a reliable and economically efficient energy source that will continue to be used for decades. The Department of Energy's Annual Energy Outlook 2018 predicts that in the absence of major climate legislation, U.S. coal production will decline slightly through 2050 yet remain firmly in America's energy mix. Electrical power generation is by far the largest consumer of coal in the United States, using about 91 percent of all coal mined.

Wyoming has emerged as a national leader in coal technology development and research. The State of Wyoming has invested \$15 million in public-private partnerships with several utility cooperatives to study the capture, sequestration and management of carbon emissions. Real world testing at the Wyoming Integrated Test Center (ITC) uses 20 MW of coal-based flue gas. Research conducted at the ITC will lead to new opportunities for petro-chemicals from coal as well as commercial uses of carbon dioxide. The facility welcomed its first research teams from five different nations in the spring of 2018.

Other projects are being pursued throughout the state and at the University of Wyoming to unlock the untapped potential of our coal resource for innovative carbon and composite materials to create products ranging from car and airplane parts to medical devices and building products.



Wyoming is home to over **1.4 TRILLION TONS** of total coal resources in seams ranging in thickness from **5 feet** to some in excess of **200 feet** in the **Powder River Basin (PRB)**. Recent estimates from the Wyoming Geological Survey give Wyoming more than **165 BILLION TONS** of recoverable coal.

REGULATORY ENVIRONMENT

The federal regulatory environment remains challenging. While recent changes from the federal administration have offered relief, the uncertainty of the Environmental Protection Agency's (EPA) Clean Power Plan (CPP) has had an impact on Wyoming's coal industry, with states charged with making the deepest cuts under the CPP tending to be major users of Wyoming coal. While the EPA, under new leadership, has introduced and is pursuing its repeal and replacement of the CPP, some states are considering implementing similar options for the reduction of CO₂ emissions. Power generators must consider the viability of bringing coal-fueled generation into compliance with stricter carbon emissions standards or looking elsewhere for solutions. While the industry has certainly seen regulatory relief with the change in policy direction from Washington, DC, challenges remain, and restrictive emission standards for carbon dioxide remain a significant hurdle to overcome.

LOCAL BENEFITS

Coal is an important source of income for Wyoming and is the second largest source of tax revenue for state and local governments, after natural gas. Coal mining companies remit taxes and royalty payments to all branches of government, federal, state and local. Coal's estimated contribution to Wyoming in 2017 was just under

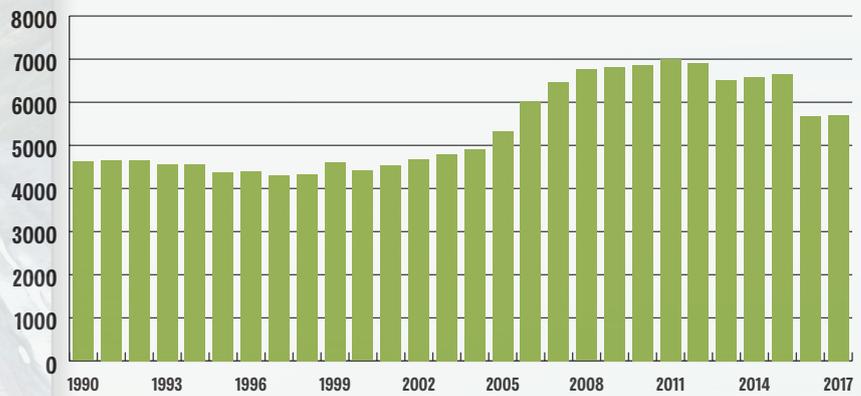
\$900 million in taxes, royalties and fees, reflecting a \$178 million, or 16.7 percent, decrease from 2016. This number highlights the magnitude of the slowdown in Wyoming's coal industry in recent years.

In 2018, Wyoming received \$44.9 million in Abandon Mine Lands (AML) funds, up 6.3 percent from 2017. The state no longer receives "prior year replacement" funds. Changes in the law mean that future AML funding will not be linked to production, regardless of the amount generated by the \$0.28 per ton AML tax paid by companies on surface coal production.

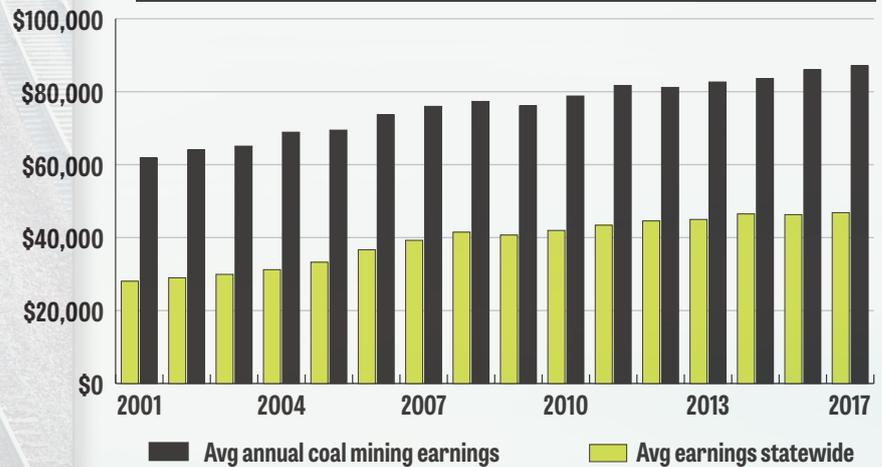
Employment in Wyoming's 16 operating coal mines remained fairly level for 2017, with nearly 5,700 workers employed directly in the industry. Coal industry jobs are among the best paying in the state with Wyoming coal miners collecting an average wage of \$89,311, excluding benefits. The take-home pay is almost twice the statewide average wage of \$46,250 per worker. Estimates indicate that each coal industry position supports an additional two jobs in the service and supply sectors, bringing direct and indirect employment to more than 17,000 workers.



WYOMING COAL EMPLOYMENT, 1990-2017



AVERAGE WORKER WAGES, 2001-2017



LEASE BONUS BIDS

Leasing federal coal reserves is a detailed, time consuming and highly-regulated process. Each proposed lease must be requested through the Bureau of Land Management (BLM) in a Lease by Application (LBA) request. A mining company nominates proposed tracts for lease and the BLM completes detailed environmental assessments or environmental impact statements.

The BLM assesses proposals to determine the coal's market value and scope of the application and establishes sale parameters. Interested companies with the ability to economically and viably mine the coal submit competitive bids. The lease is either awarded to the highest bidder or rejected if the BLM deems the offer too low.

Successful bidders for a coal lease pay a bonus bid for each ton of reserves. This is an additional payment on top of the royalty paid to the federal government when the coal is mined. This payment is split between the state and federal government and is paid out over a five-year period. At this time, there are a limited number of potential leases in the LBA system. The last payment on coal leased to date was \$5.3 million in 2018. State revenue from coal will continue to be impacted until more federal coal is leased.

Wyoming has received more than \$2.3 billion in coal bonus bid dollars since 2003. The money has funded most new schools built in the last decade, highways and community colleges across the state and every Wyoming county has benefitted from the funds.

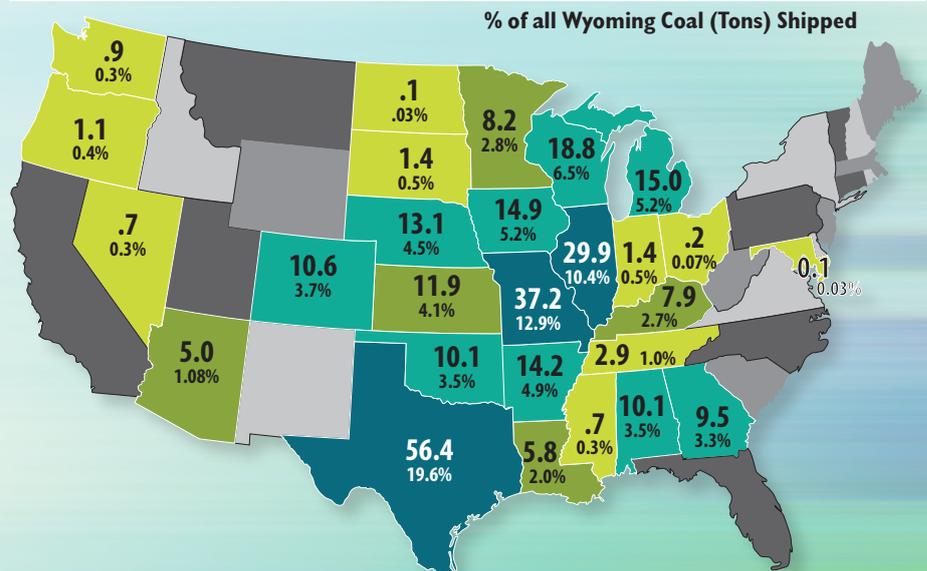
2017 WYOMING COAL SHIPMENTS

State	Coal (Tons)	%
Texas	56,423,433	19.57
Missouri	37,189,986	12.90
Illinois	29,909,136	10.38
Wisconsin	18,855,282	6.54
Michigan	15,047,591	5.22
Iowa	14,936,305	5.18
Arkansas	14,217,537	4.93
Nebraska	13,087,776	4.54
Kansas	11,896,923	4.13
Colorado	10,561,432	3.66
Alabama	10,110,518	3.51
Oklahoma	10,104,741	3.51
Georgia	9,459,754	3.28
Minnesota	8,192,967	2.84
Kentucky	7,862,455	2.73
Louisiana	5,844,237	2.03
Arizona	5,033,807	1.75
Tennessee	2,874,557	1.00
Indiana	1,425,757	0.49
South Dakota	1,379,234	0.48
Washington	1,113,471	0.39
Oregon	877,037	0.30
Nevada	743,292	0.26
Mississippi	718,095	0.25
Ohio	212,365	0.07
Maryland	97,639	0.03
North Dakota	96,615	0.03
Total	288,271,942	100 %

See map for more details.



COAL SHIPMENTS FROM WYOMING, 2017



During 2017, **288 MILLION TONS** of coal moved by unit trains to energy markets in **27 STATES**.



Reclamation goes **BEYOND JUST RESTORING** contours and reseeded native plant species. Reclamation specialists strive to build **SUSTAINABLE NATURAL ECOSYSTEMS USING INNOVATIVE METHODS** and new techniques to further enhance reclaimed areas.

RECLAMATION

Reclaimed mine lands represent sustainable development in action. Reclamation is done contemporaneously in a multi-stage process once the recoverable coal is removed. Highly-trained specialists employed by the mines manage the reclamation, and state and federal personnel provide oversight to ensure compliance with all applicable laws. Reclamation at Wyoming coal mines has been recognized with multiple awards as the best in the nation.

Reclamation stages include:

- Backfilling the void with overburden.
- Contouring the filled surface.
- Replacing topsoil and preparing the surface.
- Preparing the seedbed and sowing approved seed mixtures
- Monitoring plant growth and fauna populations.

Approved seed mixtures used in reclamation promote higher vegetative output than what is found on pre-mined land, attracting animals and plants to re-establish and promote a sustainable ecosystem. The success of reclamation is apparent on reclaimed land in the Powder River Basin and at other sites across Wyoming, such as PacifiCorp's project near the Dave Johnson power plant at Glenrock.

Land which houses facilities such as mine shops, coal plants, long-term roads, and ponds cannot be reclaimed until long-term use is complete. Year-to-year reclamation focuses on all other areas, as demonstrated by comparison of current disturbance and reclamation.

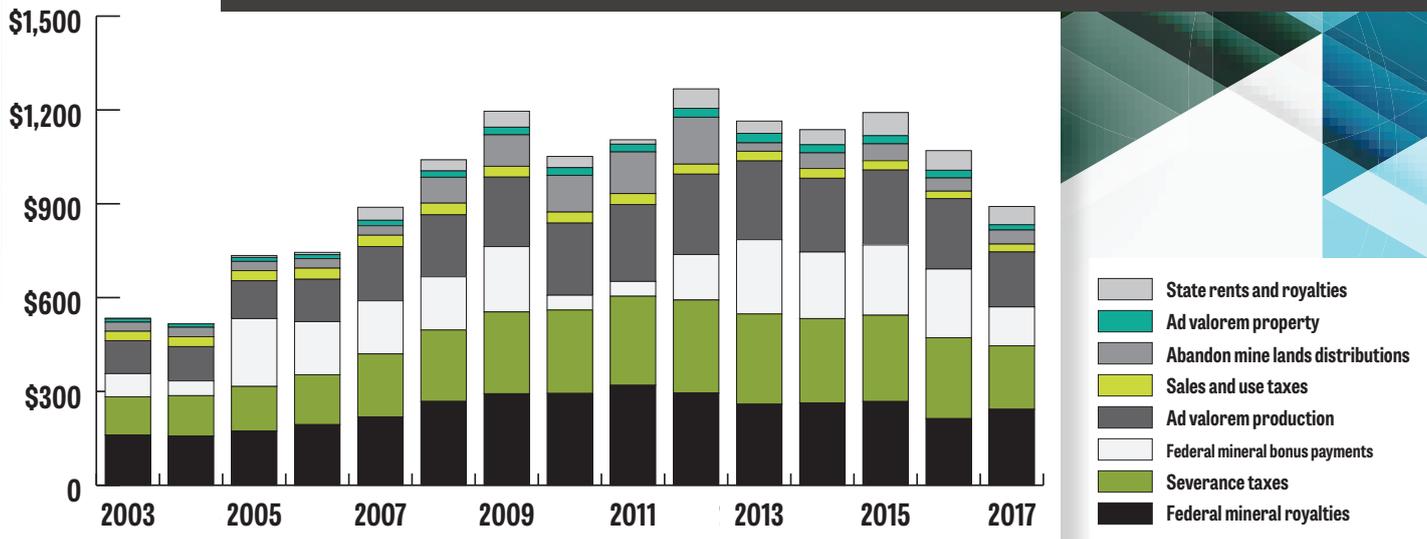
Reclamation goes beyond just restoring contours and re-seeding native plant species. Reclamation specialists strive to build sustainable natural ecosystems using innovative

methods and new techniques to further enhance reclaimed areas. Some examples include:

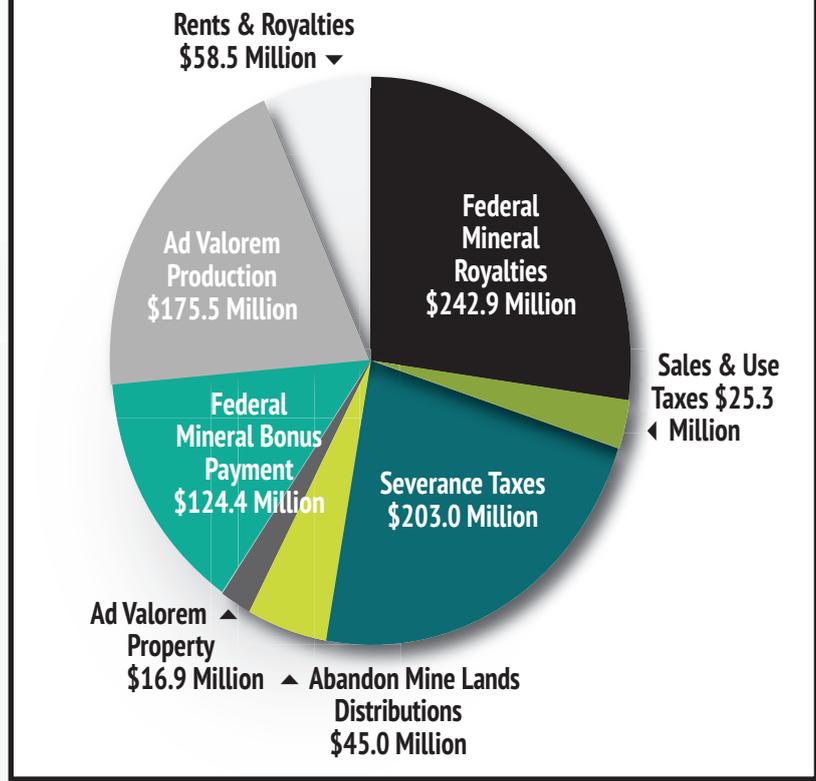
- Re-establishment of water features and storage in reclaimed streams, stock ponds and wetlands.
- Replacement of sage grouse breeding grounds.
- Establishment of mosaic patterns in grassland and shrubland reclamation.
- Replacement of rock outcrops and providing prey base habitats for eagles and other predators.
- Reconstruction of prairie dog towns and reclamation of mountain plover habitat.



TREND IN WYOMING STATE AND LOCAL GOVERNMENT REVENUE, 2003-2017



CONTRIBUTIONS OF COAL TO WYOMING STATE & LOCAL GOVERNMENT IN 2017



Wyoming has received more than **\$2.3 BILLION** in coal bonus bid dollars since 2003. The money has funded most **new schools built in the last decade, highways and community colleges** across the state and **EVERY WYOMING COUNTY** has benefitted from the funds.

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For More Info Visit: www.wyomingmining.org

2017 WYOMING COAL PRODUCTION BY COUNTY

LOCATION/OPERATOR	MINE	EMPLOYEES	PRODUCTION
Campbell County			
Buckskin Mining Co.	Buckskin Mine	202	14,517,853
Cloud Peak Energy LLC	Antelope Coal Mine	526	28,506,357
Cloud Peak Energy LLC	Cordero Rojo Complex	366	16,725,065
Blackjewel Coal	Belle Ayr Mine	244	15,826,344
Blackjewel Coal	Eagle Butte Mine	271	17,264,483
Peabody	Caballo Mine	160	11,125,949
Peabody	Rawhide Mine	113	10,346,144
Peabody	North Antelope/Rochelle Complex	1,364	101,595,323
Thunder Basin Coal Co. LLC	Black Thunder Mine	1,220	70,513,366
Thunder Basin Coal Co. LLC	Coal Creek Mine	155	8,963,048
Western Fuels of Wyoming, Inc.	Dry Fork Mine	79	6,045,618
Black Hills Energy	Wyodak Mine	63	4,182,800
Carbon County			
Arch of Wyoming, LLC	Elk Mountain Mine	4	
Arch of Wyoming, LLC	Seminole II Mine	5	
Lincoln County			
Westmoreland Kemmerer Inc.	Kemmerer Mine	285	4,224,426
Sweetwater County			
Black Butte Coal Co.	Black Butte and Lucite Hills	172	2,555,732
Bridger Coal Co.	Surface Operations	228	2,495,558
Bridger Coal Co.	Underground Operations	230	1,715,801
TOTAL:		5,687	316,603,867
TONS/EMPLOYEE		55,672	