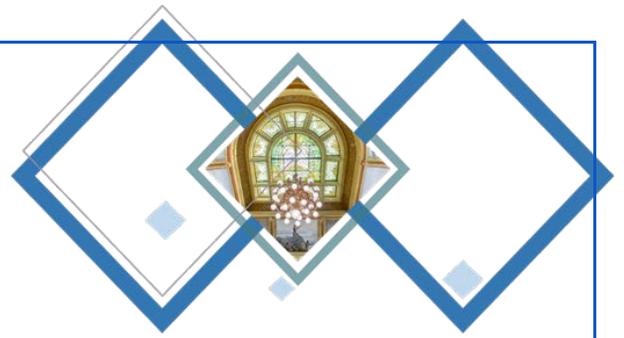


January 17, 2018

SJ 5: Coal in Montana
Environmental Quality Council



SENATE JOINT RESOLUTION 5: COAL IN MONTANA

COAL FOR POWER

Montana coal generates electricity around the world, and the state is home to the nation's largest coal reserves, but the planned closure of coal-fired electric plants around the U.S. will affect the industry and the revenue it generates. In 2015 about three-quarters of all coal mined in Montana was shipped by rail to out-of-state utilities and foreign nations. Montana used the rest, with about 90 percent consumed to produce electricity at the Colstrip Generating Station.¹

Across the country from 2002 to 2016, 531 coal-fired power plants, or 59 gigawatts (GW), were retired, according to U.S. Energy Information Administration (EIA) data. Another 12.7 GW is scheduled to retire through 2020, and the EIA's 2017 Annual Energy Outlook estimates nearly 90 total GW of U.S. coal capacity will be retired between 2017 and 2030.

A snapshot of coal production in Montana is included in **Figure 1**.

COAL FOR EXPORT

In 2015, about half of Montana's coal production was sent by rail to other states and burned in coal-fired power plants, according to the EIA. Since 2007, Michigan, Minnesota, and Montana used about three-quarters or more of all the coal mined in Montana for energy generation as demonstrated in **Figure 2**. The remainder likely was either exported to western Canada, where much of it continued on to Asia or was exported through traders and brokers. Most Montana coal that goes overseas is shipped to the Westshore Terminal, a British Columbia coal port off the shore of Vancouver.

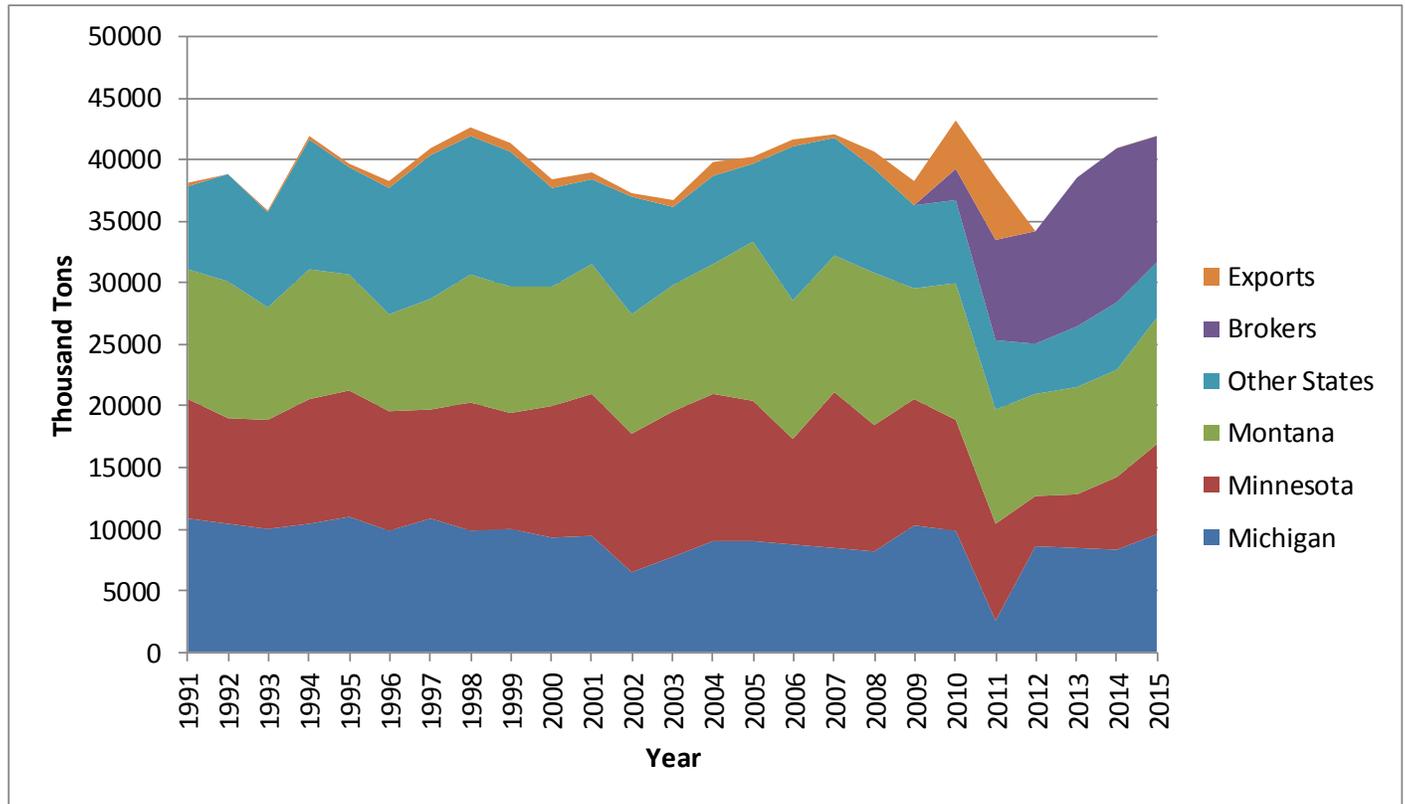
Montana Coal Production in Million Tons

2007	43.2
2008	44.9
2009	39.6
2010	44.7
2011	42
2012	36.7
2013	42.2
2014	44.5
2015	42.1
2016	32.4

FIGURE 1 -- MONTANA COAL COUNCIL

¹ "Understanding Energy in Montana: A Guide to Electricity, Natural Gas, Coal, Petroleum, and Renewable Energy Produced and Consumed in Montana," Jeff Blend, Montana Department of Environmental Quality draft report and updates before Energy and Telecommunications Interim Committee, January 2018.

FIGURE 2 – DISPERSION OF MONTANA MINED COAL -- MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY



Traders and brokers don't consistently report the final destination of coal exports, and the EIA provides only estimates of coal exports by brokers and traders. Since 2011, those estimates show increasing amounts of Montana coal being exported out of the country.² Discrepancies between coal production numbers or totals overall in Montana and coal shipped to U.S. power plants as demonstrated in the tables below are largely attributable to coal exported through brokers and traders that is estimated but not included in the tables. Estimates show that much of the coal from Signal Peak, for example, is exported out-of-the country and that much of the coal from Spring Creek is either exported out of the country or sold to brokers.

The attached table for 2016 coal shows where 23.2 million tons, or about 72% of the 32.4 million tons of coal mined in Montana, was dispersed. That is consistent with overall estimates that about half of Montana mined coal is burned in power plants across the U.S. and about a quarter is burned in Colstrip. Between 2008 and 2015, Montana coal also went to the plants listed in the 2016 table. The information, however, was not repeated in the second table. For example, nearly all the coal mined at Rosebud was burned at Colstrip between 2008 and 2016, and coal from the Absaloka Mine was sent to the Sherburne facility every year since 2008.

² "Understanding Energy in Montana: A Guide to Electricity, Natural Gas, Coal, Petroleum, and Renewable Energy Produced and Consumed in Montana," Jeff Blend, Montana Department of Environmental Quality draft report and updates before Energy and Telecommunications Interim Committee, January 2018.

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The tables below do not account for overseas exports, sales through brokers or traders, or future gains that could be attributable to new energy demand. They demonstrate only where Montana coal has been burned in U.S. power plants. Two tables are included--one for 2016 providing a snapshot in time for Montana coal exports, and a second demonstrating the diversity in Montana coal exports.

In 2017, Montana coal production also increased over historical low number in 2016. As of October 2017, coal production was about 2 million tons ahead of 2016 numbers, according to EIA data. The increased production is attributed to Spring Creek, according to information from the Montana Coal Council. Exports to Asia, primarily South Korea and Japan, fueled the 2017 uptick, according to Cloud Peak, the owner of the Spring Creek mine. The U.S. Department of Energy in December announced that U.S. coal exports for the first three quarters of 2017 were 69 million tons, or 68 percent higher than exports for the same period in 2016.

The same EIA data estimates U.S. coal production for the first 11 months of 2017 at 719 million short tons, or 8 percent higher than production for the same period in 2016. Annual production is expected to be 791 million tons in 2017, falling to 771 million tons in 2018 because of lower exports and no growth in coal consumption.³

The tables below use information from an EIA database that tracks where coal mined in the U.S. is burned. The tables list the coal-fired power plants in the U.S. that burned Montana coal since 2008. An outlook on those power plants is included, based on utility or energy company and public utility commission and regulatory data.

³ <https://www.eia.gov/outlooks/steo/report/coal.php>

Which U.S. Power Plants Burned Montana Coal in 2016?

Coal Plant	Megawatts	Outlook	Owner Position	MT Coal Used
TES Filer City Station CMS Energy, MI	73 MW	Consumers Energy says the coal and biomass plant will be converted to natural gas in 2018.	CMS Energy has stated it is transitioning to clean energy sources and retired their seven oldest coal-fired generating plants.	In 2016, the facility used about 144,402 tons of coal from Signal Peak.
DTE-BRSC Shared Storage DTE Energy, MI	1,664 MW Belle River 1,547 MW St. Clair	Belle River is scheduled to retire in 2030. St. Clair is scheduled to retire between 2020 and 2023.	In May, DTE Energy , Michigan's largest electricity supplier, announced plans for an 80% reduction in carbon emissions and the closure of all of its coal-fired power plants by 2050.	In 2016, 2.1 million tons of Decker Mine coal shipped to the facilities – about 49% of its average annual production.
Presque Isle Power Plant We Energies, MI	359 MW Unit 5 & 6: 55 MW Unit 7-9: 83 MW Units 1 & 2: Retired Units 3 and 4: Retired	The plant is expected to be retired by 2020 and replaced by two natural gas generating stations. In October 2017, the Michigan Public Service Commission approved a request to build 2 gas plants and once complete allow for closure of the plants.	We Energies announced in 2017 it will shut down its Pleasant Prairie coal-fired power plant (1,200 MW) in 2018, citing pressures from inexpensive natural gas and stagnant demand. The utility also announced it would be investing in renewable energy, with plans to have 350 MW of solar online by 2020.	In 2016, the plant received 631,587 tons of Spring Creek coal.
Clay Boswell Minnesota Power, Minn.	1,025 MW Units 1 and 2: 70 MW Unit 3: 350 MW Unit 4: 535 MW	The Minnesota PUC in 2016 approved Minnesota Power's 15-year resource plan, calling for retiring 2 older units at Clay Boswell by 2022, 2 years earlier than the utility proposed. Units 3 and 4 are not scheduled for retirement.	Minnesota Power says its long-term goal is to transition from about 75% coal to 1/3 coal, 1/3 renewables, and 1/3 natural gas, a strategy officials are calling EnergyForward. Ten years ago Minnesota Power generated about 95 percent of its electricity from coal.	In 2016, the facility used about 1.3 million tons of Montana coal. The plant has used coal from the Decker Mine, the Spring Creek Mine, and the Rosebud Mine.



Which U.S. Power Plants Burned Montana Coal in 2016?

Coal Plant	Megawatts	Outlook	Owner Position	MT Coal Used
Sherburne County Xcel Energy and Southern Minnesota Municipal Power Agency, Minn.	2,238 MW Unit 1: 680 MW Unit 2: 682 MW Unit 3: 876 MW	In 2016, the Minnesota Public Utilities Commission approved a plan to retire the Sherburne Unit 2 by 2023 and Unit 1 by 2026. Unit 3 is not scheduled for retirement.	Xcel , is closing 2 of its coal units in Pueblo a decade ahead of schedule. Xcel is requesting bids for 1,000 MW of wind, 700 MW of solar and 700 MW of natural gas under its Colorado Energy Plan. SMMPA's main source of electricity is its 41% share of Unit 3. It sells to 18 municipal utilities.	In 2016, 3.8 million tons of Montana coal was shipped to the Sherburne County plant – about 70% of the average annual production at the Absoloka Mine.
Stanton Station Great River Energy, North Dakota	198 MW	The plant shut down in 2017. Great River Energy announced in 2016 that it would close the plant rather than undertake expensive upgrades. It is scheduled for demolition in 2018.	Great River Energy provides electricity to 28 cooperatives serving 1.7 million customers. It remains dependent on fossil fuel plants, primarily coal for baseline generation But wind has increasingly become an investment of choice.	In 2016, the plant received 397,710 tons of Spring Creek coal.
Coronado Salt River Project, Arizona	773 MW Unit 1: 389 MW Unit 2: 384 MW	SRP is in ongoing discussions with EPA on regional haze requirements at the facility.	Four utilities, including SRP , agreed to close the Navajo Generating Station by 2019 due to competition from cheaper natural gas.	In 2016, about 475,000 tons of Spring Creek Coal went to Coronado.
Centralia TransAlta, Wash.	1,340 MW Units 1 & 2: 670 MW	Based on an MOU with Washington state, TransAlta will shut down the first unit at Centralia in 2020. The second will stop burning coal in 2025.	TransAlta in 2017 announced a strategy to accelerate the transition to gas and renewable generation.	In 2016, the facility received 2.5 million tons of Spring Creek coal or about 15% of the mine's average annual production.



Which U.S. Power Plants Burned Montana Coal in 2016?

Coal Plant	Megawatts	Outlook	Owner Position	MT Coal Used
<p>Colstrip Generating Station</p> <p>Talen Energy, Puget Sound Energy, Portland General, Avista, PacifiCorp, and NWE, Montana</p>	<p>2,094 MW</p> <p>Units 1 & 2: 307 MW</p> <p>Units 3 & 4: 740 MW</p>	<p>Units 1 and 2 will close by July 1, 2022, under a legal settlement. No retirement date is scheduled for Units 3 and 4. Under a plan approved by the Washington Utilities and Transportation Commission, Puget Sound Energy, the largest owner of the Colstrip plant, will pay down its debts from Units 3 and 4 by 2027.</p>	<p>PSE: In 2016, 37% of the company’s fuel mix for electricity came from coal.</p> <p>PGE: PGE will cease serving customers with power from Colstrip by the end of 2035.</p> <p>Avista: Avista is poised to be acquired by Hydro One of Ontario. In 2015 Ontario banned coal-fired electricity.</p> <p>PacifiCorp: PacifiCorp’s 2015 energy plan includes “ending coal generation at 10 units by 2029. By 2034, the company will reduce reliance on coal by 2,800 megawatts.</p> <p>NWE: 60% of generation from wind and water in 2016. 22% from owned thermal and the remainder from contract thermal.</p> <p>Talen: In August 2017, Talen Energy Corp. informed the co-owners of the plant that it planned to operate the facility and keep it open.</p>	<p>In 2016, 8.5 million tons or 85% of the coal mined at Rosebud, was used at the Colstrip Generating Station.</p>

- The information in this table was compiled using the U.S. Energy Information Administration Beta Database. Projects published in Beta are not final and are for comment only. The coal data browser and database is available [here](#). Totals may not equal sum of components because of independent rounding.
- The U.S. coal data are collected and prepared for release by the Office of Oil, Gas, and Coal Supply Statistics, U.S. Energy Information Administration (EIA). The data are compiled from the following EIA survey source: Form EIA-923, "Power Plant Operations Report" and the U.S. Department of Labor, Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine Employment and Coal Production Report."
- The categories used in the database are for coal receipts, with one exception. Coal distributed to industrial plants includes a small amount of coal consumed by coal preparation plants.
- The EIA in its Annual Coal Distribution Report includes estimates of coal exports data by brokers/traders. The coal exports by brokers/traders are estimated. The data in EIA Form 923 indicate that starting in 2011, large amounts of Montana coal were exported out of the country, or exported by brokers to locations unknown. Information as to where broker exported coal went is not available. This table does not include coal that went overseas.

Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
Michigan -- In 2016, coal-fired power plants provided 36% of Michigan's electricity generation; 2 years earlier, they had provided 50% of the state's electricity. Twenty-five coal units in the state are scheduled to shut down by 2020. EIA			
Karn-Weadock	2,100 MW	Consumers Energy is closing 7 of its coal-fired plants. Closures include Karn- Weadock (2 units, 310 MW). The closure will leave Consumers with 5 units operating: 3 at the 1,450-MW Campbell plant and 2 (511 MW) at Karn-Weadock.	Absaloka; Spring Creek
BC Cobb	320 MW	Closed 2016.	Absaloka; Spring Creek
Monroe	3,066 MW	DTE says it plans to close Monroe in 2040.	Decker; Spring Creek
Wyandotte	73 MW	Can burn coal, natural gas, and tire derived fuel.	Decker; Spring Creek
River Rouge	651 MW	One unit retired in November 2015, and the other is planned for retirement in 2023.	Spring Creek
James De Young	62 MW	Retired in 2016 and replaced with natural gas.	Spring Creek
Shiras	77 MW	In 2017 Marquette Board of Light & Power officials said the Shiras coal-fired steam plant may no longer be a cost-effective generating asset in the long term.	Spring Creek
Minnesota -- About 39% of utility-scale electricity generation in Minnesota came from coal-fired electric power plants in 2016, down from 44% in 2015. Almost all of Minnesota's coal supply comes by rail from Wyoming and Montana. EIA			
Syl Laskin	110 MW	Converted to natural gas.	Decker; Signal Peak/Bull Mountain
Taconite Harbor Energy Center	150 MW	Idled in 2016 with full-closure planned in 2020.	Decker; Spring Creek
Hoot Lake	139 MW	According to a 15-year resource plan, Otter Tail Power will close Hoot Lake in 2021.	Spring Creek



Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
<p>Ohio -- Ohio is among the top 5 coal-consuming states in the nation. Twice as much coal is consumed in Ohio as is produced there. In 2015, 15% of the state's coal-fired generation capacity was retired. However, in 2016, coal still fueled almost three-fifths of the state's power generation. EIA</p>			
FirstEnergy Ashtabula	256 MW	Closed in 2015.	Signal Peak/Bull Mountain
FirstEnergy Eastlake	1,257 MW	Closed in 2015.	Signal Peak/Bull Mountain
FirstEnergy WH Sammis	2,210 MW	Units 1-4 , about 720 MW of capacity, will retire in May 2020. Units 5-7 will continue to provide 1,490 MW of baseload generation.	Signal Peak/Bull Mountain
FirstEnergy Lakeshore	245 MW	Closed in 2015.	Signal Peak/Bull Mountain
FirstEnergy Bay Shore	136 MW	Bay Shore Units 2-4 were deactivated in 2012. Additional units to be sold or closed by 2020.	Signal Peak/Bull Mountain
Avon Lake	766 MW	NRG announced in 2017 a corporate reorganization that allowed GenOn Energy, a subsidiary of NRG, to file Chapter 11 bankruptcy. The plant's future will be determined by GenOn, after its emergence from bankruptcy.	Spring Creek
Niles	266 MW	Closed in 2012.	Spring Creek
<p>Pennsylvania -- Pennsylvania has the nation's fifth-largest coal-fired electric generating fleet. Many of the state's coal-fired generating plants are older, and, with the increased availability of economic natural gas, 1/3 of Pennsylvania's coal-fired generating capacity shut down between 2010 and the end of 2016. EIA</p>			
FirstEnergy Bruce Mansfield	2,490 MW	The plant was idled in February 2016, and restarted for some periods in 2017. The company is looking to potentially sell the plant.	Signal Peak/Bull Mountain



Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
New Castle Plant	330 MW	Converted to natural gas.	Spring Creek
Hatfields Ferry Power Station	1,710 MW	Closed in 2017.	Spring Creek
Chewswick Power Plant	565 MW	In 2017 the Sierra Club filed suit against the state Department of Environmental Protection for failure to enforce drinking water standards at the site. The plant continues to operate.	Spring Creek
Wisconsin -- In 2016, coal provided 52% of the state's net electricity generation. EIA			
Valley	280 MW	Converted to natural gas.	Signal Peak/Bull Mountain
Alma Site	400 MW (remaining)	Alma Station and JP Madgett Station are part of the Alma site. Alma Station is retired. John P. Madgett continues to operate.	Signal Peak/Bull Mountain
Nelson Dewey Generating Station	200 MW	Closed in 2015.	Spring Creek
Arizona – The Navajo Generating Station is scheduled to close in 2019, removing nearly two-fifths of Arizona’s coal-fired capacity from service. EIA			
Apache Station	605 MW	Units can burn coal or natural gas.	Decker
Cholla	1,129 MW	Unit 2 (289 MW) closed in 2015. PacifiCorp plans to retire Unit 4 (414 MW) by 2024. Unit 1 (113 MW) and Unit 3 (312 MW) remain in operation.	Spring Creek



Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
<p>North Dakota -- In 2016, about 71% of North Dakota's net electricity generation came from coal. In 2015, North Dakota had 5.3% of the nation's recoverable coal reserves at producing mines and accounted for 3.2% of U.S. coal production. EIA</p>			
RM Heskett	100 MW	Units 1 and 2 continue to operate.	Absaloka
<p>South Dakota -- Coal's contribution has fallen from more than half the state's net electricity generation in 2008 to 1/5 in 2016. EIA</p>			
Big Stone	475 MW	In June 2008, the Sierra Club filed a lawsuit against Otter Trail Power, alleging violations of the Clean Air Act. The case has since been dismissed.	Absaloka
<p>Texas -- Coal-fired power plants historically accounted for about 1/3 of net electricity generation, but, in 2015, with older coal plants reducing operations or closing, coal supplied about one-fourth of generation. EIA</p>			
Gibbons Creek	470 MW	The Texas Municipal Power Agency in 2017 told the Electric Reliability Council of Texas that it plans to operate the plant for only five months of the year.	Rosebud
<p>Montana -- Montana produces almost 5% of the nation's coal from half a dozen mines. In 2015, about 1/4 of the coal mined in Montana was consumed in the state, and all but a small fraction of that coal was used to generate electric power. About half of Montana's coal production was sent by rail to other states in 2015. The remaining 1/4 was exported to western Canada, where much of it continued on to Asia. Montana has the nation's largest estimated recoverable coal reserves and holds 1/4 of the nation's demonstrated coal reserve base. EIA</p>			
Hardin Generating Station	116 MW	Rocky Mountain Power recently announced it may close the facility in early 2018 unless purchased by another company.	Absaloka



Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
<p>Colorado -- Coal-fired power plants provide just over half of the state's net generation, and natural gas provides almost one-fourth. Electricity from renewable sources has more than doubled since 2010 to around one-fifth of the state's net electricity generation in 2016, led by increased wind power. EIA</p>			
Valmont	186 MW	Xcel announced it stopped burning coal at the facility in March 2017.	Signal Peak/Bull Mountain
<p>Iowa -- Iowa's five largest power plants by capacity are all coal-fired, and coal is the primary fuel used for electricity generation. As recently as 2008, coal accounted for 3/4 of Iowa's net electricity generation. In 2016, for the first time in decades, coal-fired plants produced less than half of the electricity generated in the state. EIA</p>			
Streeter Station	88 MW	Can burn natural gas or coal.	Signal Peak/Bull Mountain
<p>Indiana -- More than four-fifths of Indiana's electricity generation has historically been fueled by coal. In 2016, only 7 of every 10 MWh was generated by coal, while the 2016 share of net generation from natural gas more than doubled from two years earlier, to nearly 2 of every 10 MWh. Nine of the state's 10 largest power plants are still coal-fired, but more than 1,000 MWs of older coal-fired generating capacity was retired during 2016. EIA</p>			
Rockport	1,300 MW	Indiana Michigan Power Co. said in a 2015 resource plan they plan to keep the plant open through at least 2028 by renewing a lease and upgrading pollution controls.	Signal Peak/Bull Mountain
State Line Energy	515 MW	Closed in 2012.	Decker; Spring Creek
<p>Missouri -- Coal fuels about three-fourths of Missouri's net electricity generation, and 8 of the 10 largest power plants in the state are coal-fired. Coal's share of net generation has declined slightly as some older coal-fired plants have shut down or switched to natural gas. EIA</p>			
Asbury	213 MW	Empire District Electric wants to more than triple the amount of energy its gets from wind and close its Asbury coal plant in 2019.	Spring Creek
James River Power Station	253 MW	Converted to gas and/or idled.	Spring Creek



Which additional U.S. Power Plants Burned Montana Coal Between 2008-2015?

Coal Plant	Megawatts	Outlook	MT Coal Used
West Virginia -- Coal-fired electric power plants accounted for 94% of West Virginia's net electricity generation in 2016. EIA			
FirstEnergy Harrison Power Station	1,984 MW	Fully operational.	Spring Creek
FirstEnergy Pleasants Power Station	1,300 MW	The West Virginia Public Service Commission is considering approval of the power plant transfer by First Energy to its subsidiaries, Mon Power and Potomac Edison.	Spring Creek
New York -- Since 2000, coal has been providing progressively less of New York's net electricity generation because new generating capacity has been mostly natural gas-fired. In recent years, less than 5% of New York's net electricity generation has been fueled by coal. EIA			
Cayuga Operating Company	323 MW	Upstate New York Power Producers sought PSC approval to repower Cayuga with natural gas, but failed. In 2016, Upstate sold both the Cayuga and Somerset plants to Riesling Power LLC, a wholly owned subsidiary of Beowulf Energy LLC.	Spring Creek
Somerset Operating Co.	655 MW	In 2016, Upstate sold both the Cayuga and Somerset plants to Riesling Power LLC, a wholly owned subsidiary of Beowulf Energy LLC.	Spring Creek
Oregon – In 2016 Oregon enacted legislation that requires two large investor-owned utilities operating in the state to supply 50% of the state's electricity from renewable sources by 2040. The law also requires these utilities to phase out electricity from coal by 2030. EIA			
Boardman	550 MW	Planned for retirement in 2020.	Spring Creek



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- Between 2008 and 2015, Montana coal also went to the plants listed in the 2016 table. The information, however, was not repeated in the second chart. For example, nearly all the coal mined at Rosebud was burned at Colstrip between 2008 and 2016. Coal from the Absaloka Mine also was sent to the Sherburne facility every year since 2008. Decker coal shipped to Clay Boswell annually since 2008, with the exception of 2011. Decker coal also annually goes to shared storage for St. Clair and Belle River. Every year, Spring Creek coal has gone to Presque Isle, Clay Boswell, Centralia, Coronado, and with the exception of 2008, Stanton, Belle River, and St. Clair.