A Research Paper by

Planning for Montana's Energy Transition

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ABOUT HEADWATERS ECONOMICS

Headwaters Economics is an independent, nonprofit research group whose mission is to improve community development and land management decisions in the West.

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I. INTRODUCTION

Montana faces a number of questions concerning coal's role in its economy, fiscal policy, and local economic development. Coal production in the U.S. is declining in response to cheap natural gas, changing consumer demand, new environmental regulations, and weak coal export markets. These changes also are affecting Montana's coal industry. While the state as a whole is likely to experience relatively small impacts, coal-dependent communities in Eastern Montana are likely to feel the acute effects of job losses and declining tax revenue in the coming decades.

This report provides context to help Montanans understand what is driving the energy transition, how and where the impacts will be felt, and to pose important policy questions as the state considers its options in responding to shifting energy markets, consumer demands, and state and federal regulations.

Key Trends

- The coal industry is declining for reasons that precede and extend beyond potential federal carbon regulations. Coal mining and coal utilization in power generation are declining because of cheaper alternatives (natural gas and increasingly renewable energy sources), existing regulations limiting mercury and other air pollutants, changing consumer demands, and because of declines in export demand. Financial markets and analysts view declines in coal production and utilization as part of a permanent structural shift in U.S. energy markets.

- Montana's economy has grown and diversified, adapting to and thriving in today's economy. Education, access to markets, and quality of life add to the state's natural resource sectors and are the primary drivers of economic growth. The state as a whole is less dependent on coal mining today than at any time since the 1970s when coal mining and coal-fired electricity first ramped-up in the state.

- Natural resource sectors, including coal mining and coal-fired electricity generation, remain important in Montana's rural communities where these activities are located. Declines in coal will be felt acutely in three counties: Rosebud, Big Horn, and Musselshell, and to a lesser extent, Richland County. Local employment, income, and tax revenue will be difficult to replace if and when the Colstrip generating facility closes partially or entirely and when coal production from Montana's mines slows.

These key points provide context that can help the state understand and respond to changes ahead—changes driven as much or more by market forces or by existing air quality regulations than by potential new carbon regulation. The earlier Montana begins to prepare for ongoing changes in the U.S. economy and energy sector, the more time the state will have to mitigate impacts and capture opportunities from those changes.

Important questions facing Montana's energy future include:

- How will Montana replace retired coal-fired energy?
- What changes may be required to state and local coal fiscal policy?
- What economic development and community transition strategies should be considered?

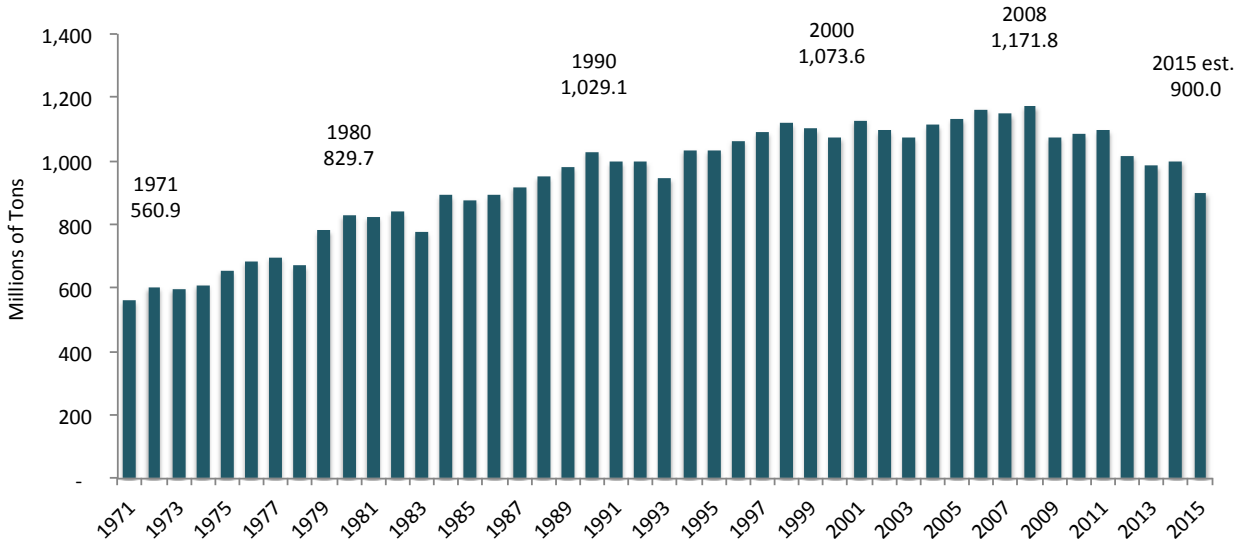
II. TRENDS IN THE U.S. COAL INDUSTRY

A major transition in U.S. energy markets is well underway and likely will continue. This section describes the changes taking place and the reasons behind them.

U.S. Coal Production Began to Decline in 2008

The first trend to note is that U.S. coal production is declining for the first time in nearly 50 years. Figure 1 shows that total U.S. coal production fell from a peak of 1,171.8 million tons in 2008 to an estimated 913 million tons in 2015, a 16 percent change.[1]

Figure 1: U.S. Coal Production (Millions of Tons), 1971-2015

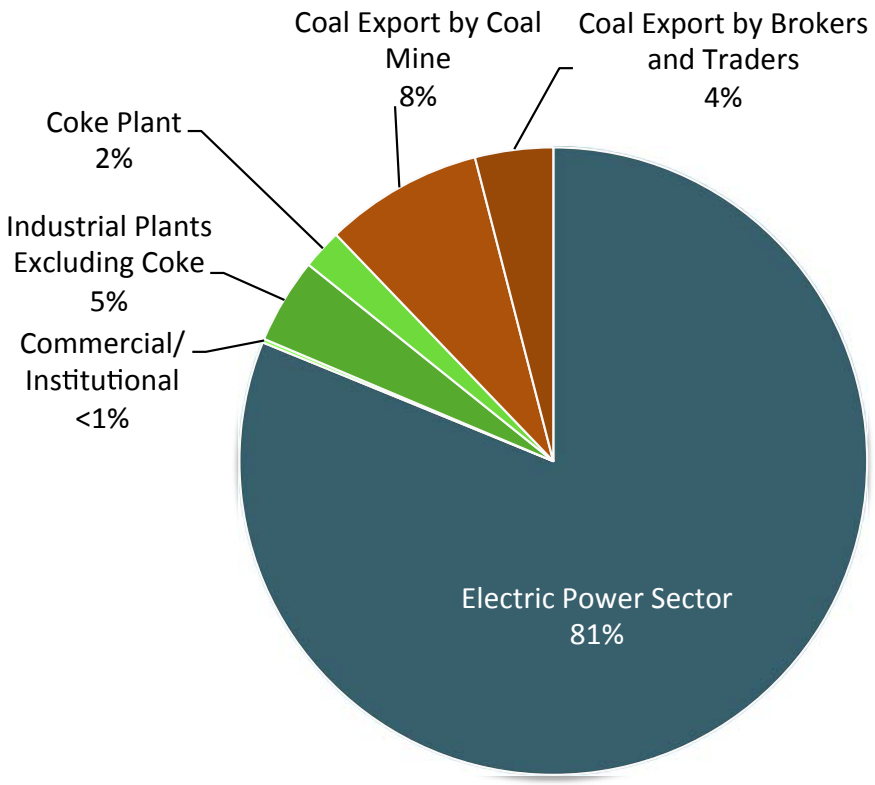


Source: U.S. Energy Information Administration (EIA); U.S. Mine Safety and Health Administration (MSHA).

Most U.S. Coal Is Used for Power Generation

Figure 2 shows that 81 percent of U.S. coal is utilized for domestic electricity generation, about 12 percent is exported, and the rest, about eight percent, is used in a variety of commercial and industrial uses, including steel-making. Demand is currently down for all of these markets: domestic power generation, metallurgical coal utilized in coking and industrial uses, and coal exports.

Figure 2: U.S. Coal Distribution by End User, 2014

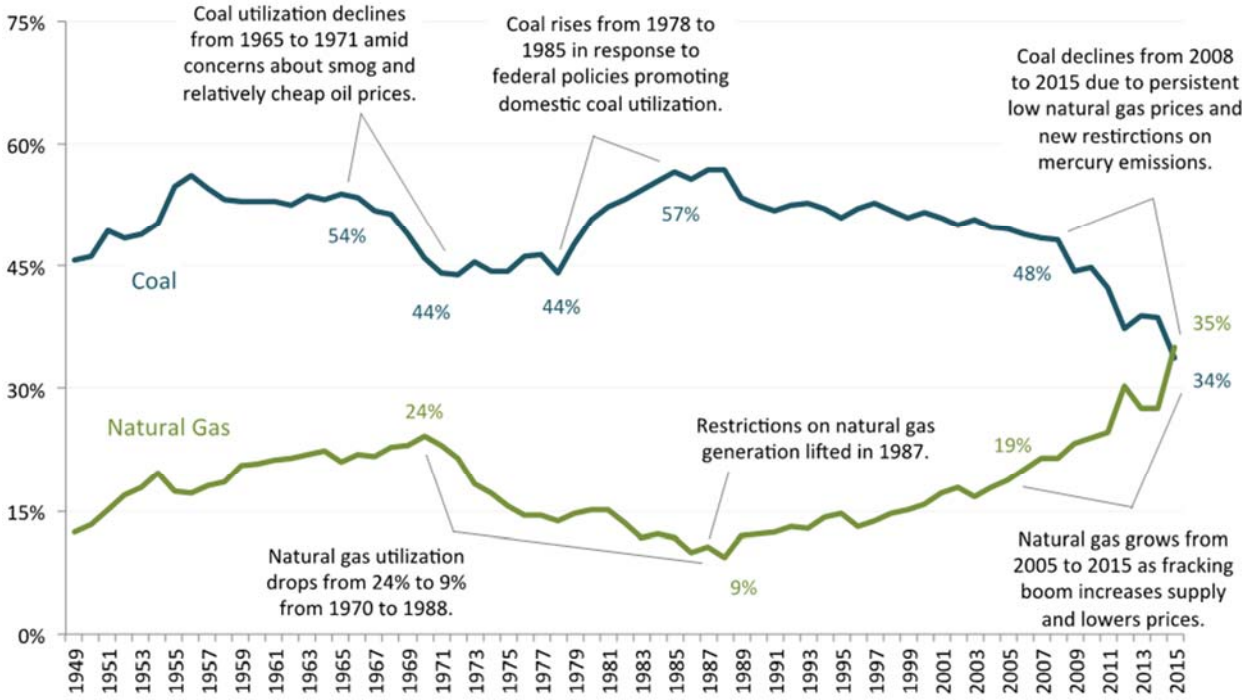


Source: U.S. Energy Information Administration (EIA).

Natural Gas Replaced Coal as the Leading Fuel in Electricity Generation in 2015

Figure 3 shows that natural gas replaced coal as the leading fuel for electricity production in the U.S. for the first time in 2015. Natural gas has been gaining on coal in U.S. power markets since the late 1980s, the result of a series of market and policy changes.

Figure 3: The Percent Share of Power Generated from Coal and Natural Gas in the U.S., 1949-2015



Source: The U.S. Energy Information Administration (EIA).

In the late 1960s and early 1970s, major U.S. cities were suffering from smog and acid rain. This became a focus for the emerging environmental movement. The 1963 Clean Air Act and amendments in 1970 first addressed interstate pollutants from high-sulfur coal and established standards to control particulate emissions from coal-fired power generators. These new air quality regulations combined with relatively cheap and cleaner burning oil, at least with respect to acid-forming sulfur oxides (SOx) and nitrogen oxides (NOx), led to relatively less coal and more oil being utilized in domestic power generation.[2]

The OPEC oil embargo and subsequent oil price spikes through the 1970s led to a reversal in fortunes for coal and natural gas. In 1977, President Jimmy Carter presented an energy plan to the nation that initiated a move away from scarce and increasingly uncertain oil and natural gas to abundant, cheap, domestic coal to meet our energy needs.[3] The president called for an increase to mine one billion tons annually (U.S. coal production was less than 700 million tons in 1977). Congress also took steps to limit natural gas in electricity production, effectively banning new gas-fired power plants in 1978 by passing the Power Plant and Industrial Fuel Use Act (PPIFUA).[4]

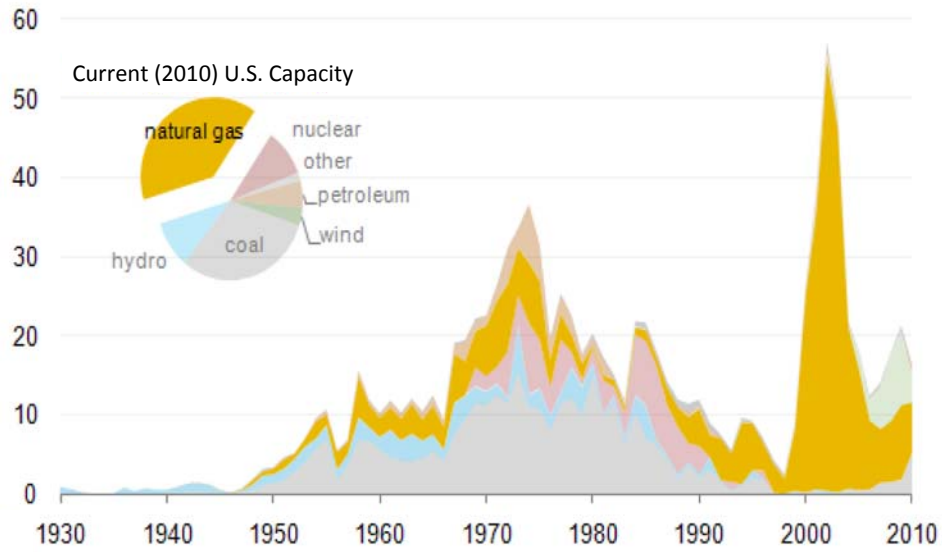
Coal-friendly policies combined with limits in natural gas utilization led to a surge in U.S. coal utilization in power generation. Coal grew from 44 percent of net generation to 57 percent from 1978 to 1985. The increase in coal-fired power generation capacity added during these seven years effectively locked-in long-standing dominance for coal in U.S. electricity markets.

After restrictions on natural gas were repealed in 1987, however, natural gas began to make inroads in U.S. power generation markets. Figure 4 shows how the U.S. effectively stopped building new coal-fired electricity generators in the 1990s and began adding new, efficient, combined-cycle natural gas-fired power plants in the 2000s.[5]

Shifts from Coal-Fired Generation Capacity to Natural Gas and Renewable Energy Generation Capacity Signal a Lasting Shift in Energy Markets

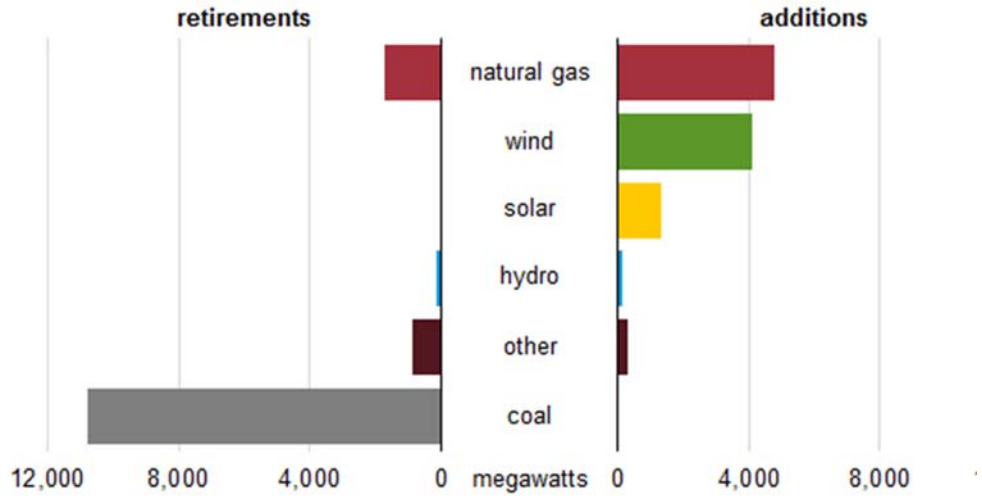
Figure 4 shows that little coal-fired generation capacity has been added in the U.S. since the early 1990s while significant new natural gas generation capacity was added in the 2000s. Figure 5 shows that more recently coal-fired power is being retired and replaced with natural gas and increasingly with renewable energy sources including wind and solar.[6]

Figure 4: U.S. Capacity Additions by Initial Year of Operation and Fuel Type, 1930-2010 (Gigawatts)



Source: U.S. Energy Information Administration (EIA).

Figure 5: U.S. Generating Capacity Retirements and Additions in 2015 (through September)



Source: U.S. Energy Information Administration (EIA).

Coal is losing market share for domestic electricity generation to natural gas and renewables for three primary reasons.

First, coal is becoming more expensive at the same time natural gas and renewable energy prices are falling.[7]

Second, clean air regulations requiring new pollution control equipment on older coal-fired power plants raise costs, accelerating the timing of coal plant retirements. For example, the EIA projected that 60 gigawatts of coal-fired generation capacity will be retired by 2020, close to a fifth of the U.S. total coal-fired generation capacity of 310 gigawatts as of 2012.[8] The timing of these retirements is attributed to new air quality regulations limiting mercury and other air toxics emissions from coal-fired power generators (the MATS Rule).[9] In effect, the cost of complying with new environmental regulations increases the cost advantage that natural gas and wind energy already hold over coal in current markets and accelerates coal-fired power plant retirements.

Third, states, utilities, and consumers are pursuing their own goals for cleaner, low-cost energy. This in turn is driving fuel switching independent of federal environmental regulations.[10] For example, utilities in Oregon and Washington states are taking actions to eliminate coal from their portfolios, including shutting down coal-fired generators in the two states[11] and seeking to end electricity imports that are generated in Montana using coal. [12]

While federal regulations on carbon emissions, if they are ultimately adopted, will add additional costs for utilities and power generators and accelerate the pace and scale of coal-fired power plant retirements,[13] most of the changes are already set in motion and will continue.[14]

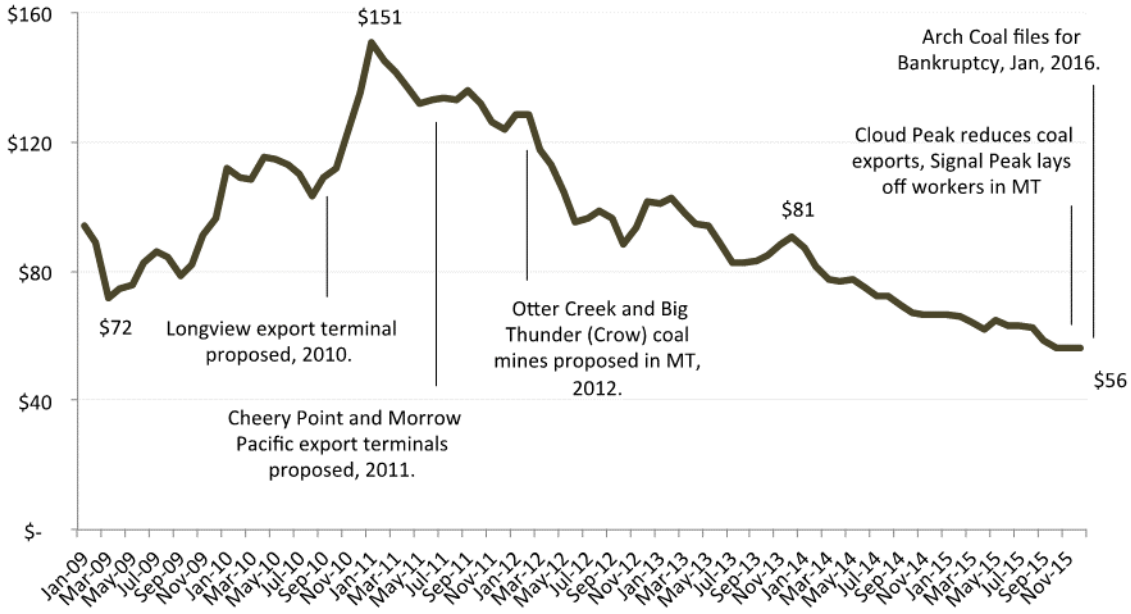
Weak Export Markets Contribute to U.S. Coal Industry Headwinds

In addition to the decline in market share for domestic energy production, coal is also losing market share in export markets. Figure 6 shows that declining Chinese demand is lowering coal prices for all exports to Asia, from a peak of $151 per ton in early 2011 to about $56 at the end of 2015 (based on the benchmark

price for seaborne thermal coal exported from Newcastle, Australia).[15] China's lower demand has reduced prices for all exports to Asia, making coal exports uneconomical for many U.S. producers.

Declining demand for coal by China is reducing export prices to Asia, further weakening prospects for U.S. and Montana coal producers. The U.S. exported more than 10 million tons to China in 2012. By 2014, U.S. coal exports to China declined to less than 2 million tons, and the EIA projects that coal exports to China in 2015 will be about 500,000 tons, a decline of 95 percent in three years.[16]

Figure 6: Benchmark Australia Thermal Coal Export Price, 2009–2015 (2015 $s per Ton)



Source: IndexMundi.

As with domestic coal markets, the primary question is whether current low prices and weak demand are the result of a short-term cyclical economic downturn—meaning prices and demand could return—or if current weak export markets will persist due to larger structural changes in coal utilization and costs and global climate considerations.

According to the EIA, China produced more coal than it consumed up to 2009. Between 2009 and 2013, China's rapid economic growth outstripped coal production, creating significant demand for coal imports. Chinese demand for coal raised the price of seaborne coal for all Asian export markets. The high prices resulted in significant efforts to increase U.S. export capacity from the West Coast. Seven new export terminals were proposed in Washington and Oregon states. In addition, new and expanded coal mine proposals were initiated in Montana to deliver coal to Asia, for example the Otter Creek[17] and Big Thunder[18] coal mines in Montana.

More recently, China's slowing growth, increased coal production capacity, and environmental commitments have reduced China's demand for coal, lowering the export price for all Asian markets.[19] By the end of 2015, the benchmark Australian price had fallen to about $56 per metric ton. A report on the economic potential of increased coal exports from Montana completed in 2012 estimated that Montana Powder River Basin coal could be delivered to Asian markets for about $60 per metric ton.[20] In 2015, Cloud Peak and Signal Peak, two Montana coal producers targeting the Asian export market, announced production volume reductions and layoffs.[21]

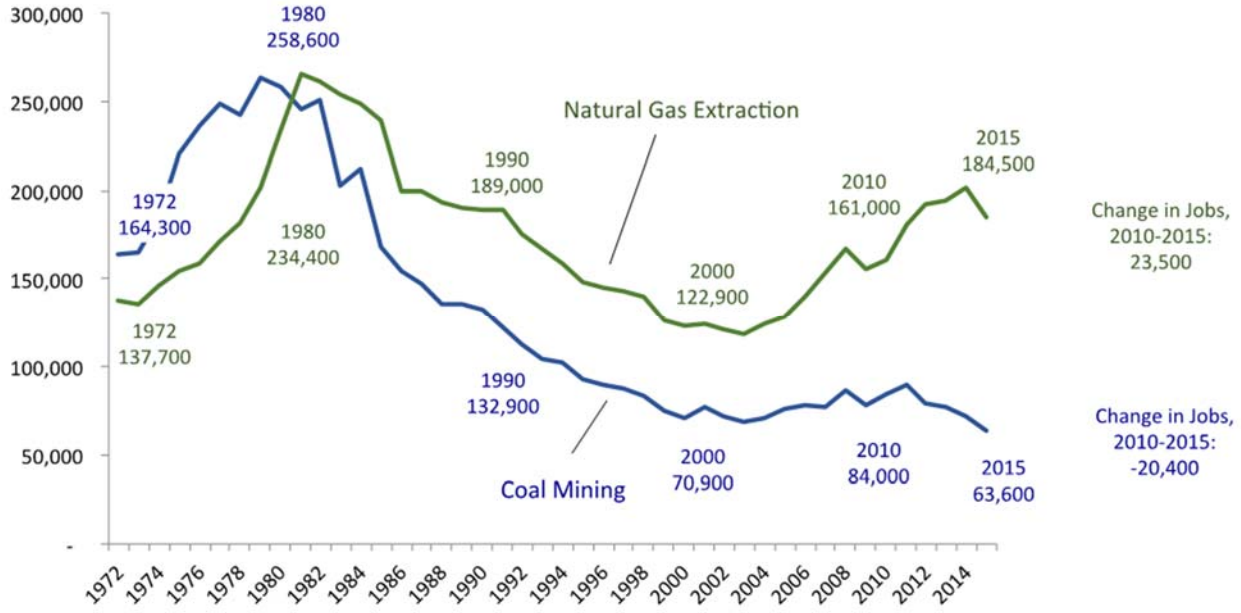
If prices remain low, export terminal projects may not be economical, new mines ultimately may not be opened, and Montana's coal industry will not see expansion opportunities envisioned just a few short years ago.[22]

The combination of changing domestic and export markets, consumer demands, and federal regulations led UBS industry analysts to title their November 2015 North American coal industry outlook "Black as Coal," assessing that coal's loss of market share to natural gas is "part of a permanent trend."[23] Companies controlling a quarter of U.S. coal production are currently in bankruptcy.[24] Most analysts agree that the industry's challenges preceded and go far beyond federal carbon regulations.[25]

The Energy Transition in the United States Will Create New Jobs

Figure 7 shows that from 2010 to 2015 the natural gas industry added 23,500 net jobs while the coal-mining industry lost about 20,400 jobs, primarily in Appalachia.

Figure 7: Direct Jobs in Coal Mining and Natural Gas Extraction, U.S. Total, 1972-2015



Source: U.S. Bureau of Labor Statistics.

The declines in coal production and coal-fired power generation—and related jobs and personal income—will be more than compensated by new natural gas and renewable energy additions—and the new jobs and income that will flow from these energy sources. In addition, the wind energy industry reports it supported another 73,000 direct jobs in 2014, more direct jobs than coal mining supported in the same year.[26]

Despite challenges, it is important to note that the coal industry is still projected to be a smaller, but sizeable part of U.S. energy production for decades to come. The EIA projects that coal will still provide 26 percent of U.S. energy production by 2040 even with carbon regulations in place.[27] Coal production is projected to decline by a fifth to a third by 2040, but that still means the U.S. could produce between 600 and 800 million tons annually for at least the next 24 years.

The challenge of the energy transition is in large part about geography and the fairness of the distribution of economic impacts. First, the transition from Appalachian coal to Western coal created winners out of Wyoming and Montana communities and losers in West Virginia, Kentucky, and elsewhere.[28] Now, the transition from coal to natural gas and renewable energy sources is boosting the economies of natural-gas communities, including Pennsylvania's Marcellus shale region and Texas's and Louisiana's Haynesville shale region. The same dynamic threatens to cost coal-dependent communities in Montana and peer coal-producing states.

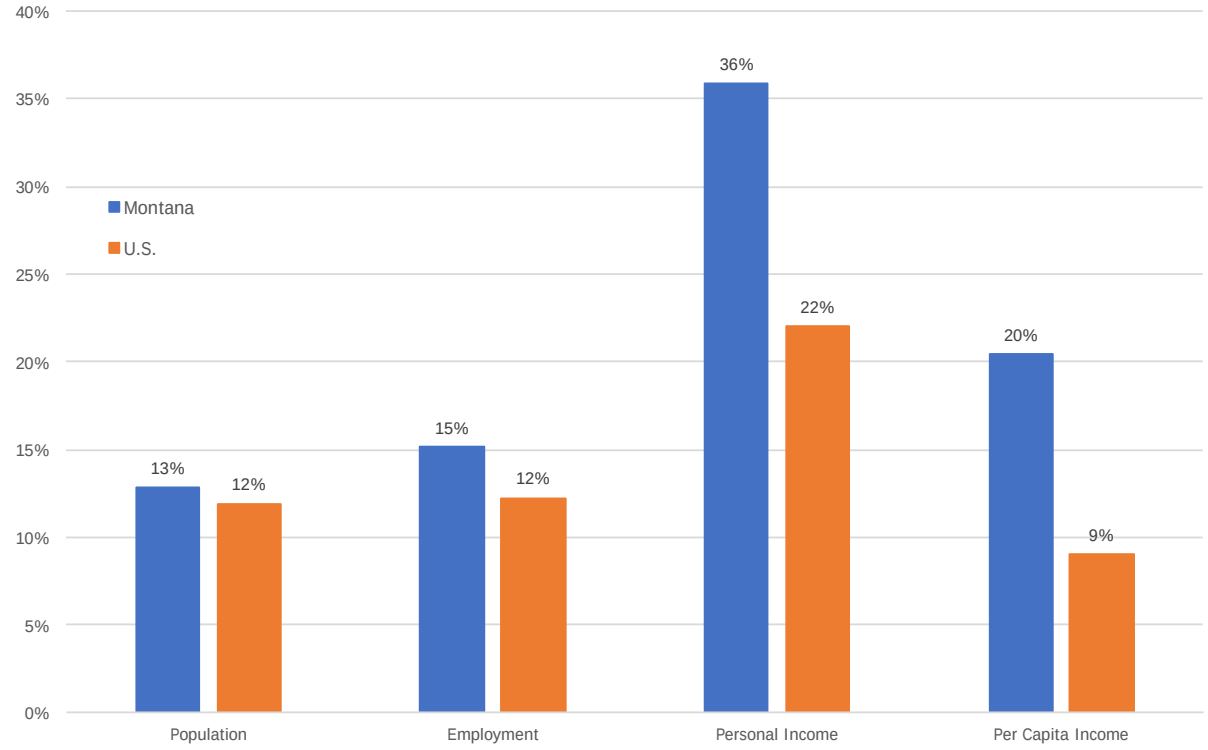
III. THE STATE PERSPECTIVE—MONTANA'S CHANGING ECONOMY

Montana's economy has changed dramatically in the last 30 years. This section profiles Montana's economic performance and the drivers behind the state's growth. In the subsequent section we discuss in more detail the role of coal in Montana's overall economy.

Montana Is Growing and Outperforming the Rest of the Nation

Figure 8 shows that Montana's economy grew faster between 2001 and 2014 than the nation overall on a number of measures of economic performance.[29] While both Montana and the U.S. populations have grown at a comparable pace (13% in Montana and 12% for the U.S.) during 2001-2014, the state added jobs at a faster rate. In addition, real personal income grew faster in Montana, increasing by more than one-third during this time. Looking at real per capita income, Montana's growth rate was more than twice as fast compared to the U.S.[30] Montana's unemployment rate is currently four percent (compared to five percent for the nation).

Figure 8: Montana Compared to the U.S. in Terms of Population, Employment, Personal Income, and Per Capita Income Growth, 2001-2014.

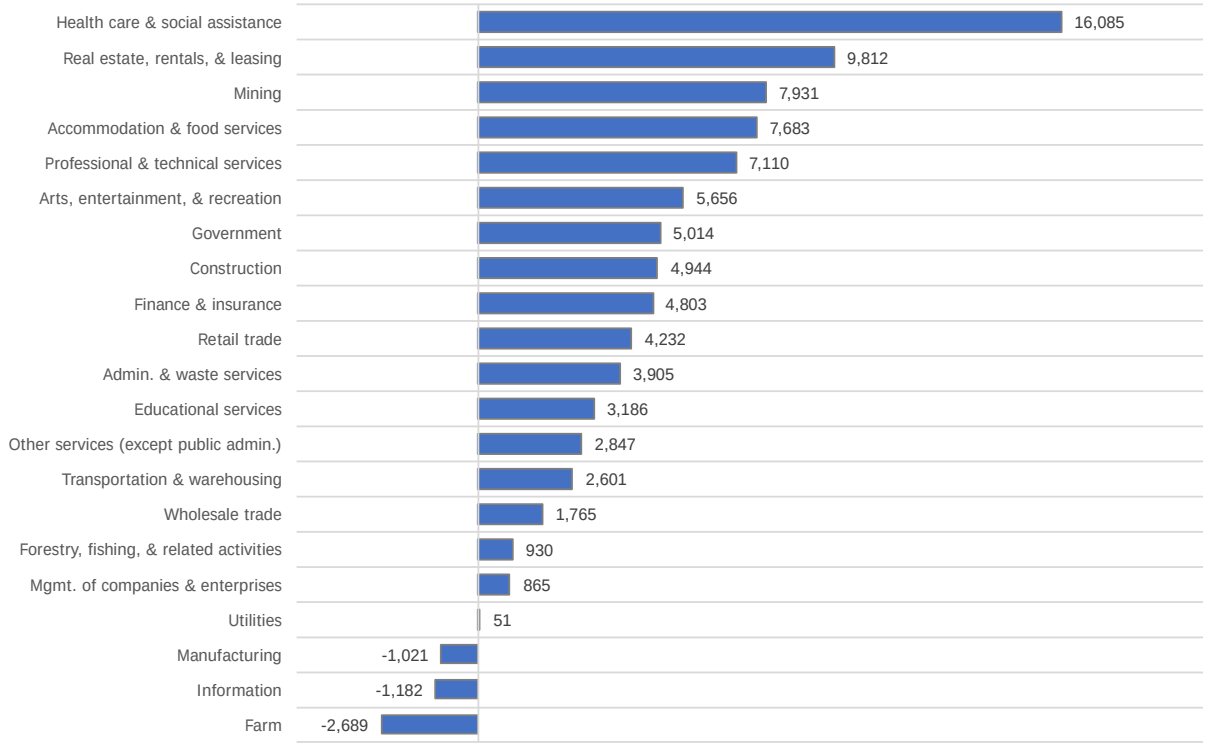


Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

A Mix of Service Industries Led Montana's Job Growth and Diversified the State's Economy

Figure 9 shows that Montana's economy added 84,528 net new jobs—with 82 percent coming from service-related industries such as health care, real estate, and professional and technical services. Mining employment also grew, primarily driven by jobs related to oil extraction in the Bakken. By comparison, coal employment has been substantially more stable, adding 655 jobs since 2001.

Figure 9: Changes in Employment by Industry, Montana, 2001-2014



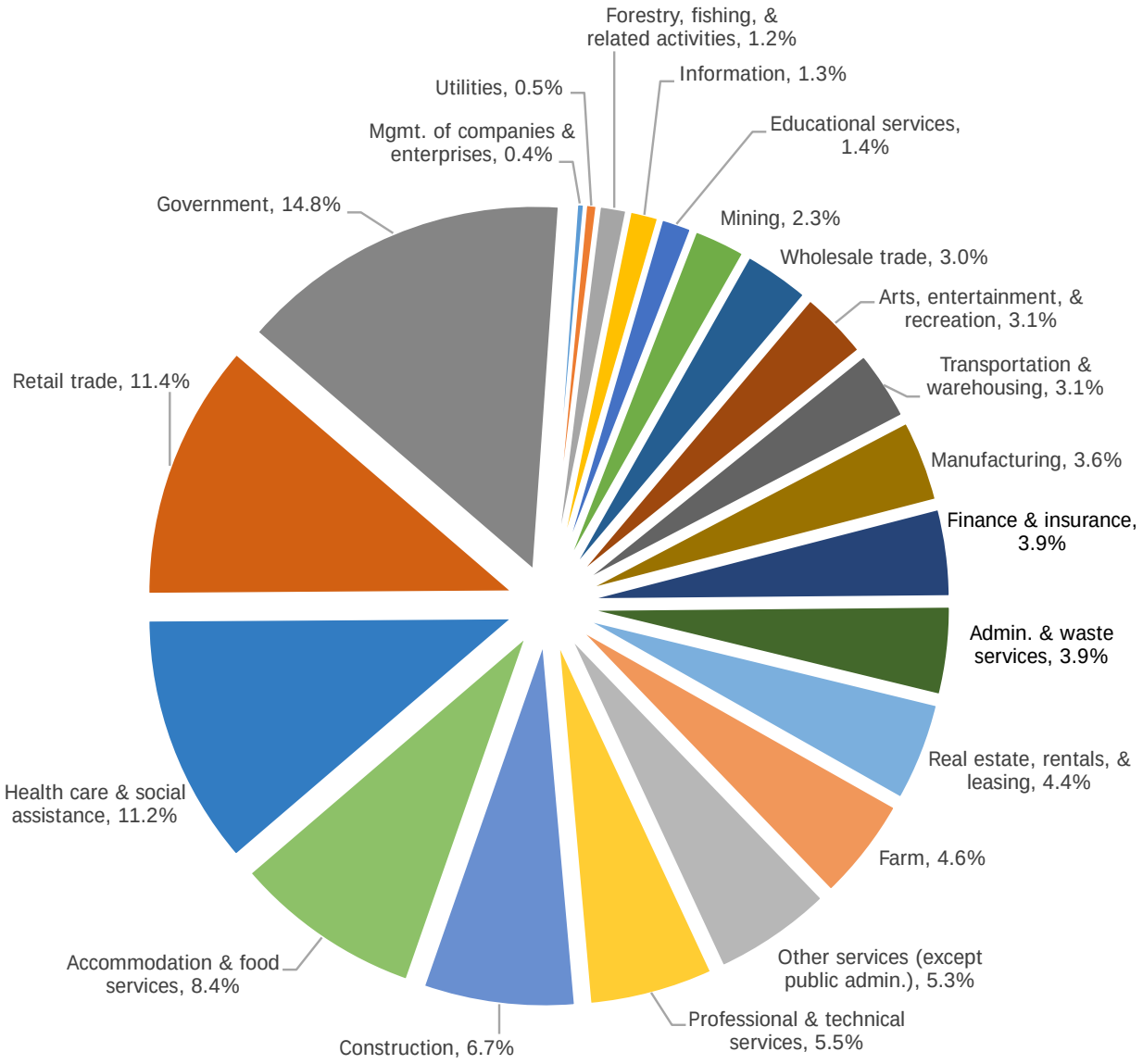
Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

Montana's economy created 5,649 net new jobs from 2013 to 2014 (latest year available) as oil extraction jobs declined. More recently, the closure of the Corette coal-fired power plant in Billings and coal mining layoffs at the Big Horn mine have reversed trends in the mining sector as the state's overall economy continues to grow.[31]

Montana's Current Economic Mix Is Diverse and Healthy

Figure 10 shows Montana's economy is made up of a broad variety of economic sectors such as health care (11.2%), retail trade (11.4%), accommodation (8.4%), professional services (5.5%), and traditional industries such as farming and ranching (4.6%), mining (2.3%), and forestry-related activities (1.2%).

Figure 10: Employment by Industry, Percent of Total, Montana, 2014



Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

Montana's Personal Income and Per Capita Income Are Increasing

Table 1 below summarizes total personal income, which grew by 36 percent (in real terms) from 2001-2014. The table also shows that non-labor income contributed $17.1 billion to total personal income in 2014, an increase of 43.1 percent from 2001.

Table 1: Change in Total Personal Income and Non-Labor Income, Montana, 2001-14

Income Source Category	Value in 2014 (billions $s)	Change, 2001-2014 (billions of 2014$s)	Percent Change, 2001-2014
Total Personal Income	$40.8	$10.8	36.0%
Non-Labor Income	$17.1	$5.1	43.1%
Dividends, Interest, & Rent	$9.4	$2.4	33.7%
Age-Related Payments	$4.6	$1.9	62.0%

Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

Non-labor income is one of the largest and fastest growing sources of income in Montana and the West. Comprised of three main types—investments, age-related payments, and hardship payments—non-labor income is affected by the stock market, retiring Baby Boomers, and changes to Medicare, Medicaid, and Social Security.

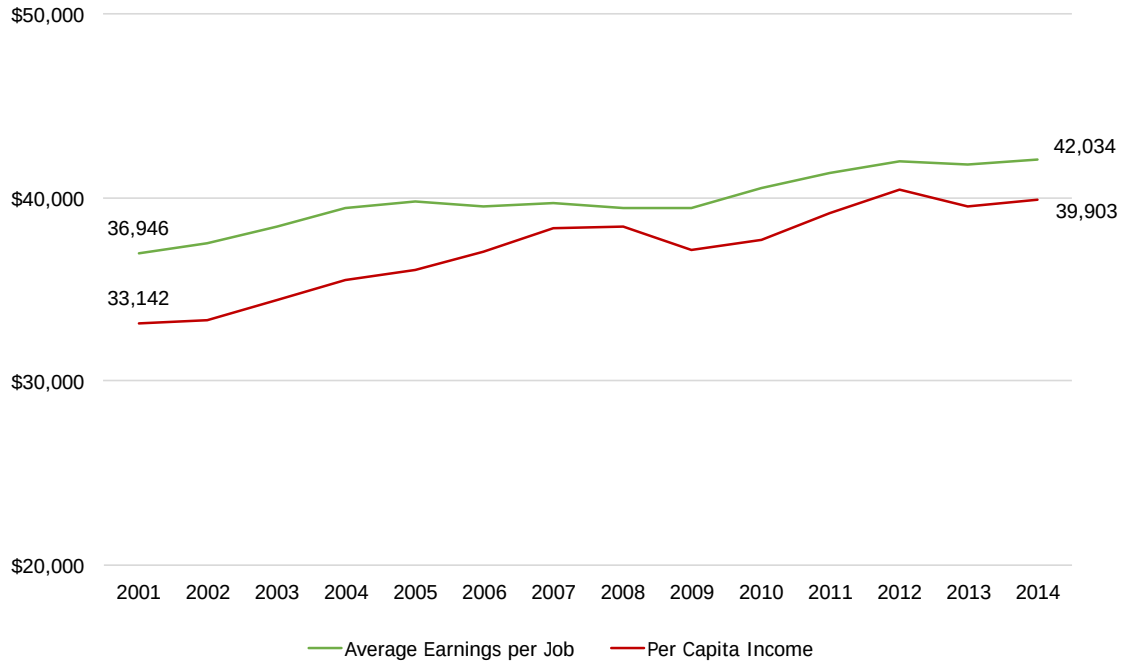
In Montana, non-labor income now accounts for 42 percent of total personal income, and nearly half of net new personal income growth in the last decade during 2001-2014. Today, roughly 60 percent of western counties receive at least 40 percent of total personal income from non-labor sources.

In 2014, investment income (Dividends, Interest & Rent) totaled $9.4 billion and was more than seven times larger than all mining income ($1.2 billion), which mostly comes from oil and natural gas. Similarly, Age-Related Payments, which are growing the fastest and projected to increase even faster in the future as Baby Boomers continue to retire, already total $4.6 billion.

Non-labor income is important because this money in turn stimulates health care, construction, and other sectors.

As noted earlier, per capita income also has increased, in real terms, rising slightly more than 20 percent from 2001-2014 (also see Figure 11 below). During that same time period, average earnings per job in Montana increased, in real terms, by 14 percent.

Figure 11: Average Earnings Per Job and Per Capita Income, Montana, 2001-2014

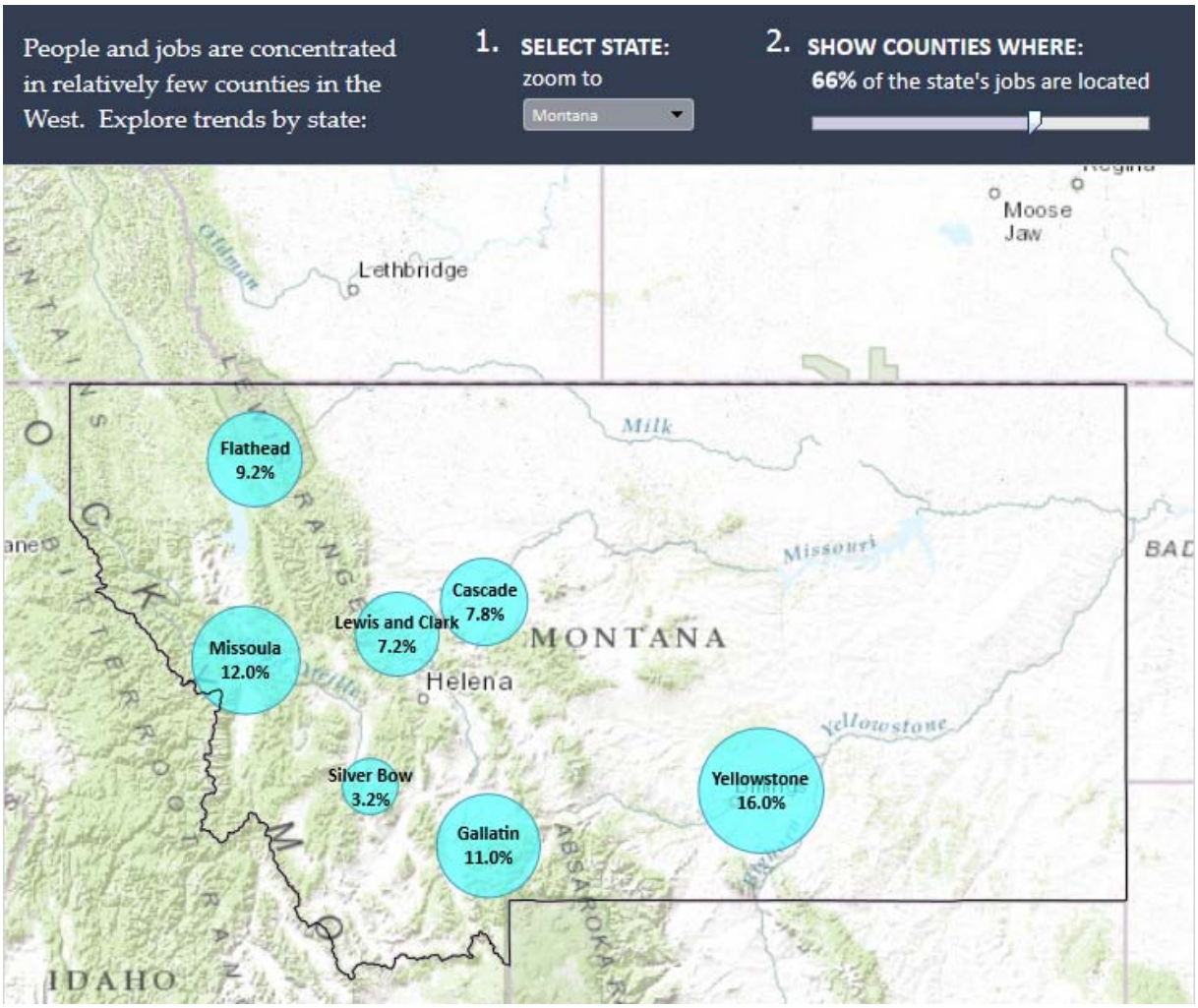


Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

Economic Growth in Montana Is Not Evenly Distributed

Urban counties in Montana now account for two-thirds of all employment in the state. Figure 12 shows that seven of Montana's 56 counties accounted for two-thirds of the state's employment in 2013. The same seven counties also generate two-thirds of personal income in the state.

Figure 12: Job Concentration in Montana



Source: U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C. Details and discussion at: http://headwaterseconomics.org/economic-development/trends-performance/urban-areas-drive-economic-growth-in-the-west.

The counties with the largest employment base also are growing the fastest. Looking at changes in population growth (births and deaths and net migration), Gallatin, Flathead, Yellowstone, Lewis and Clark, and Missoula were five of the top six fastest growing counties in Montana during the past ten years (2005-2014).[32]

Driving this uneven pattern of economic development are dramatic structural changes in the U.S. and Montana's economy in recent decades that affect the economic opportunities for different types of counties.

The primary change is a major shift away from employment in mature natural resources sectors and manufacturing. New jobs are being created in services sectors, the most important being a set of high-wage jobs in "innovation" sectors, including software, research R&D, finance, and technology. High-wage services sector jobs create new wealth and support other sectors (e.g., they have multipliers that create additional jobs in related sectors).[33]

Innovation jobs are locating in cities (and non-metropolitan areas connected to cities by airports that have access to finance, educated labor, and global markets). Montana's cities are competing successfully for these jobs and are driving the state's growth.[34] As a result, the state's assets—such as quality education, the ability to access larger out-of-state markets, and the high quality of life—increasingly play important roles in attracting businesses and people crucial to the state's economic future.

Rural counties without easy access to markets or an educated labor force will not compete as successfully for these innovation jobs. They will remain more dependent on natural resources sectors. These sectors are volatile in price and production and subject to market and regulatory forces outside of Montana's full control.

The profound shift in how and where our economies generate value, jobs, and income represents an opportunity for Montana as a whole, but challenges for parts of the state. This same challenge is evident in the current energy transition and presents difficult and disproportionate impacts in a few places.

The next section explores in more detail the role of coal in Montana and identifies the most coal-dependent communities.

IV. THE ROLE OF COAL PRODUCTION AND EMPLOYMENT IN MONTANA

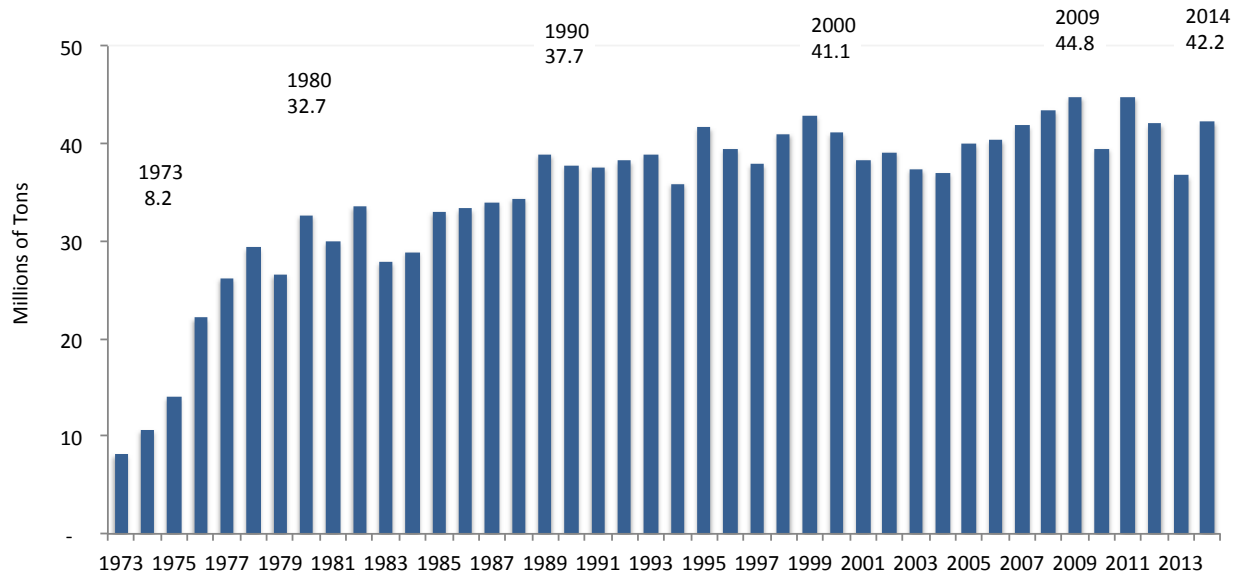
Montana holds more than a quarter of total U.S. coal reserves. While the state's economy is changing, energy production remains important in a number of communities, and Montana's energy reserves suggest that the state will play a part in the nation's energy future.

This section profiles Montana's coal resources, coal production, and the economic contributions of coal to the state and to counties that host coal mining and coal-fired generation.

Modern, Large-Scale Coal Production Began in Montana in the 1970s

Figure 13 shows Montana's coal production increased dramatically in the 1970s in response to U.S. demand, growing from about 8 million tons in 1973 to nearly 33 million tons annually by 1980.[35] Production has hovered around 40 million tons annually since the mid-1990s.

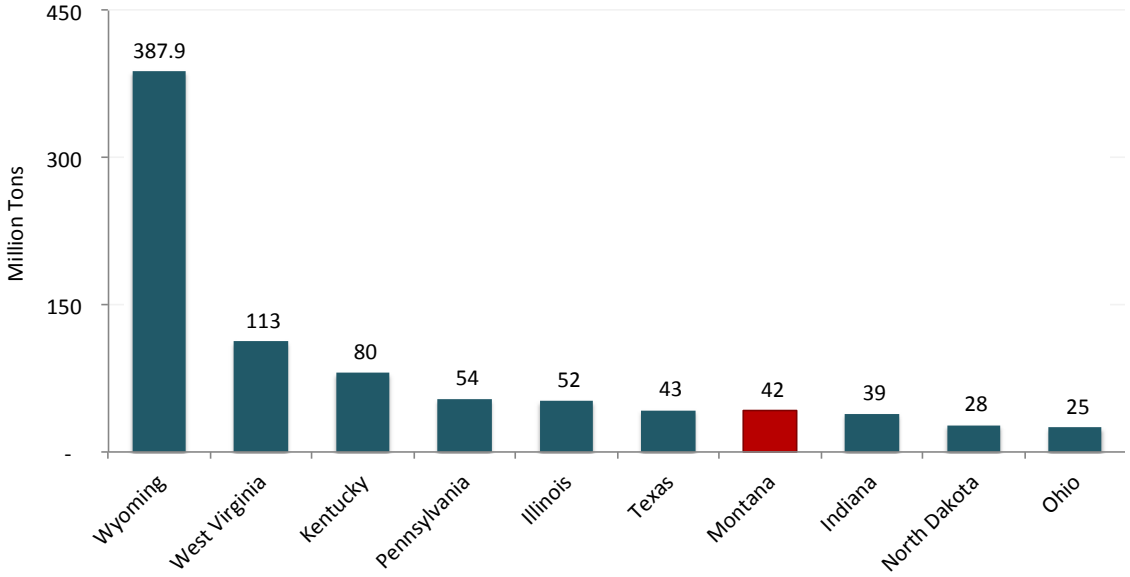
Figure 13: Montana Coal Production, 1973-2014 (millions of tons)



Source: U.S. Energy Information Administration (EIA).

Figure 14 shows that Montana is seventh among U.S. coal-producing states. Wyoming is the nation's largest, mining more than three times more coal than the next largest coal-producing state, West Virginia.

Figure 14: U.S. Coal Production by State, 2014



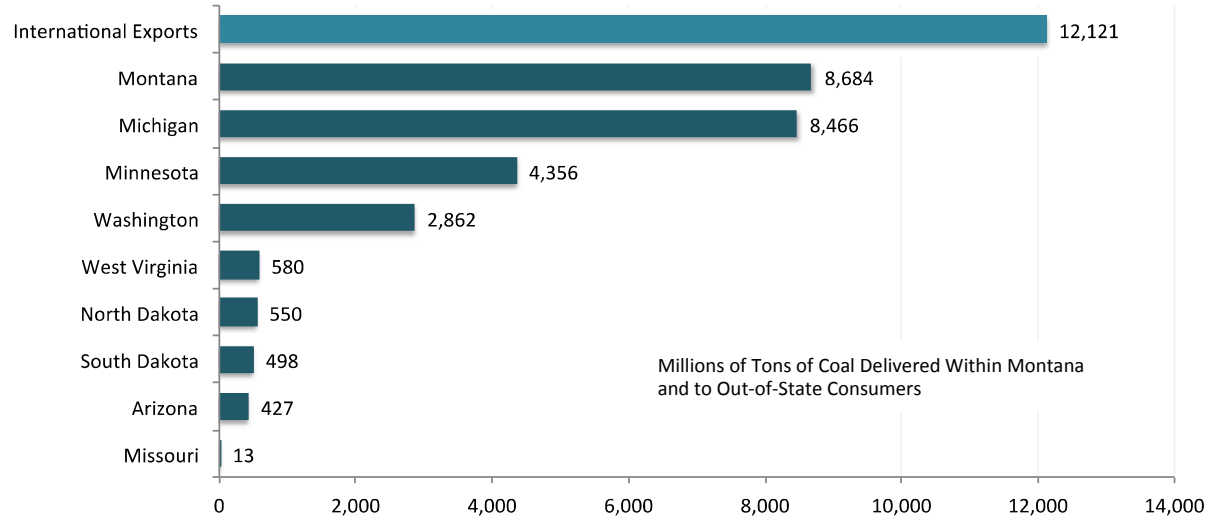
Source: U.S. Energy Information Administration (EIA).

The majority of Montana's coal production occurs in three counties: Big Horn, 27.3 million tons, Rosebud, 8.8 million tons, and Musselshell, 7.9 million tons. (County production statistics are based on Montana Department of Environmental Quality coal production data and do not match state totals reported in Figure 14 above that are based on U.S. Energy Information Administration data.)[36]

The Large Majority of Coal Mined in Montana Is Delivered to Other States and Exported Internationally

Figure 15 shows that about four-fifths of all coal mined in Montana is delivered by railroad to out-of-state customers across the U.S or exported internationally. About 50 percent of coal was shipped by railroad to utilities in other states, and roughly 29 percent of Montana coal was exported internationally in 2014. The remaining 21 percent of coal mined in Montana is utilized to generate power in the state.

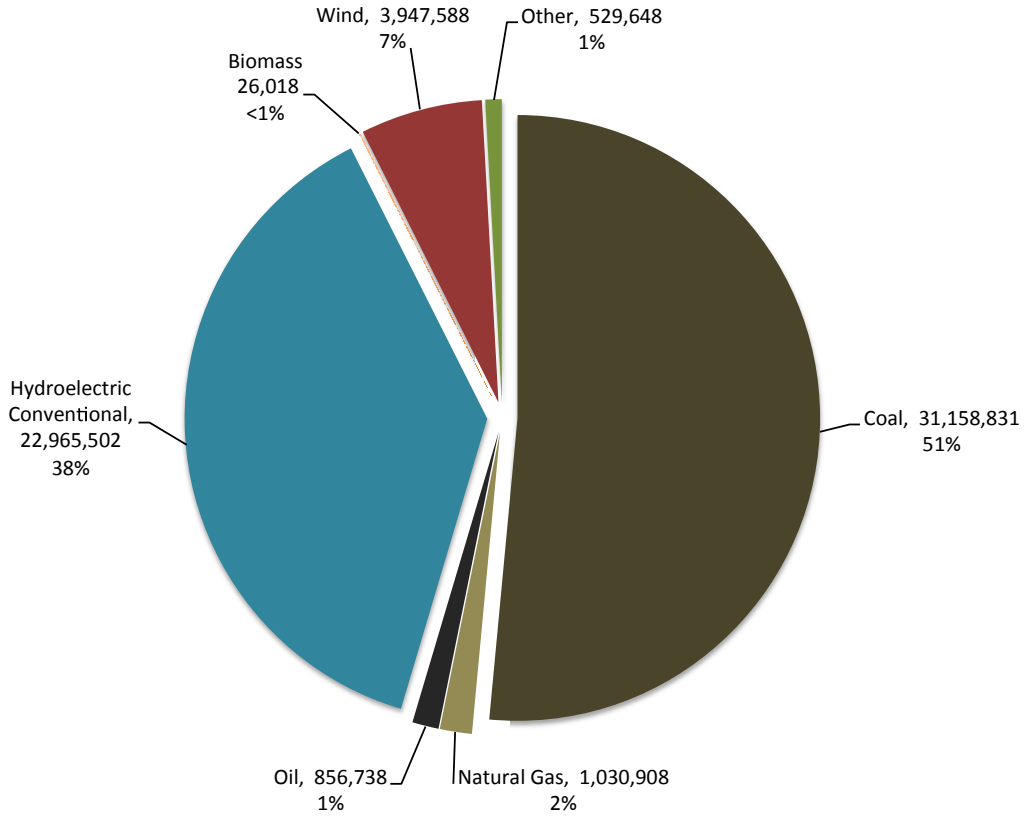
Figure15: Distribution of Montana Coal by Destination (Millions of Tons), 2014



Source: U.S. Energy Information Administration (EIA).

In addition, Montana exports between 40 and 50 percent of the total power generated in the state (1990 to 2013 average).[37] Figure 16 shows that in 2014, more than half of all energy produced in Montana is generated by burning coal (down from about 70 percent of total Montana energy produced from coal in 2001).[38]

Figure 16: Montana Net Power Generation by Energy Source, 2014 (Megawatt Hours)



Source: U.S. Energy Information Administration (EIA).

Taken together, 90 percent of all coal mined in Montana is either exported directly to be consumed outside of Montana or is exported "by wire," meaning the coal is burned in Montana to generate electricity which is then delivered by transmission line to customers in other states.

By comparison, Wyoming exports even more of its coal—93 percent to other states by railroad and another 4 percent by-wire. Coal-exporting states including Montana and Wyoming are in a difficult position relative to ongoing energy market and energy policy changes. According to University of Wyoming professor Rob Godby: "It is not what we are doing with coal, it's what other people do. Wyoming's own policies really make no difference."[39] One of the most important points is that Montana and Wyoming are not only exposed to volatile commodity markets, but also to changing consumer demands. Montana exports coal-fired electricity to Washington and Oregon and these states are working to eliminate coal from their energy portfolios.

Montana's Coal Mines are Highly Efficient, But Generate Relatively Few Jobs

Table 2 shows that while Montana ranks 7th in coal production among U.S. states, it is 15th in terms of coal employment. This is due to the high productivity of Montana's mainly surface mining industry. Montana has the second-highest productivity behind Wyoming, measured as average coal production per employee hour.[40]

Table 2: Average Production per Employee Hour by State, 2013

State	Number of Producing Mines	Number of Employees	Average Production per Employee Hour (short tons)
Wyoming	17	6,673	28.21
Montana	6	1,247	16.70
North Dakota	5	1,242	11.34
New Mexico	4	1,286	8.16
Arizona	1	405	7.49
Texas	11	2,819	7.08
Missouri	1	24	6.57
Alaska	1	125	5.70
Utah	17	1,437	5.69
Mississippi	2	309	5.57
Illinois	33	4,164	5.51
Colorado	11	2,175	5.49
Louisiana	2	280	4.56
Indiana	36	3,612	4.43
Ohio	40	3,143	3.48
Pennsylvania	315	8,382	3.01
Kentucky	370	12,905	2.76
West Virginia	325	20,281	2.44
Maryland	22	405	2.33
Oklahoma	9	204	2.05
Alabama	47	4,212	1.90
Tennessee	14	297	1.88
Virginia	118	4,521	1.76
Kansas	1	7	1.58
Arkansas	2	54	0.49

Source: U.S. Mine Health and Safety Administration.

The high productivity of Wyoming and Montana's mines make the state cost competitive in U.S. coal markets and among the safest mines in the world for workers.[41] The same efficiency and productivity has led to significant declines in coal employment as production shifts from less productive underground mines in Appalachia to huge surface mines in Montana and Wyoming. Figure 7 earlier in this report shows that the U.S. lost nearly 200,000 coal mining jobs since 1980, even as current coal production remains higher than 1980 levels.

Coal Employment Focused in a Handful of Counties

Table 3 shows that jobs in coal mining and coal-fired generation in Montana are concentrated primarily in four counties.

Table 3: Direct Employment in Coal Mining and Coal Burning, by County in Montana, 2013

Coal Mining	Jobs, 2001	Jobs, 2013	Percent of Workforce, 2013
Big Horn	339	709	30%
Mussleshell	-	186	20%
Richland	14	15	<1%
Rosebud	270	343	14%
Coal Burning			
Big Horn	30	25	1%
Richland	54	60	1%
Rosebud	388	395	16%
Yellowstone	303	320	<1%

Source: U.S. Department of Energy. 2013. Energy Information Administration and U.S. Department of Commerce. 2015. Census Bureau, County Business Patterns, Washington, D.C.

This report utilized "County Business Patterns" from the U.S. Department of Commerce to look at coal employment in specific Montana counties, rather than for employment as a whole at the state level.

Using the latest available data (2013), coal employment is especially important in Rosebud, Big Horn, and Musselshell counties. In Big Horn County coal mining and coal burning employment is 31 percent of the workforce while these sectors account for 30 percent of all workers in Rosebud County and 20 percent of all workers in Musselshell County. For the other counties, coal employment is relatively less important, reflecting roughly one percent of total employment for Richland County and a lower share in Yellowstone County.

Employment in coal burning has remained relatively constant. From 2001-2013, Big Horn County lost five such jobs, Richland County added six, Rosebud County added seven, and Yellowstone County netted 17 new jobs.

Coal mining saw slightly higher net new jobs for 2001-2013. Big Horn County added 370 jobs during this period; Rosebud added 73 net new jobs during the same time frame; and Musselshell added 186 jobs. Richland County was constant.

V. THE ROLE OF COAL FISCAL POLICY IN MONTANA

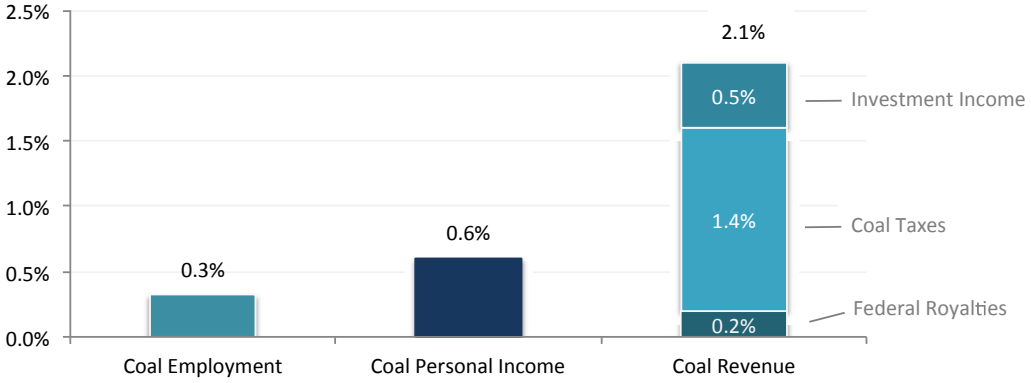
In this report, fiscal policy refers to the way state and local governments tax coal extraction and coal-fired generation and how they spend the proceeds. Fiscal policy is important to Montana's energy-dependent communities for two reasons. First, communities stand to realize significant revenue during the period when mines and plants are operating, allowing them to provide high quality services and maintain relatively low tax rates. Second, energy revenue is necessary to fund mitigation, clean up of environmental impacts associated with coal extraction and coal-fired generation, and to set aside funds to ensure lasting fiscal resources are available for the day coal mining ends.

This section profiles revenue from direct coal taxes, royalties, and income earned from permanent coal investments; describes how these revenues are allocated between savings, the state government, and local governments; and discusses changes in coal taxation over time.

Coal Represents a Relatively Larger Share of Total State Revenue Compared to the Employment and Personal Income Contributions to the State as a Whole

Revenue from coal mining and coal-fired power generation is the largest advantage (and potential liability) of Montana's coal industry when compared to the contributions of employment and personal income to the state. Figure 17 shows that coal jobs in Montana represent 0.3 percent of total employment, personal income is estimated at 0.6 percent of total personal income, and tax revenue, royalties, and income earned on coal investments are estimated to be 2.1 percent of total tax revenue (seven times greater than the employment contributions).[42]

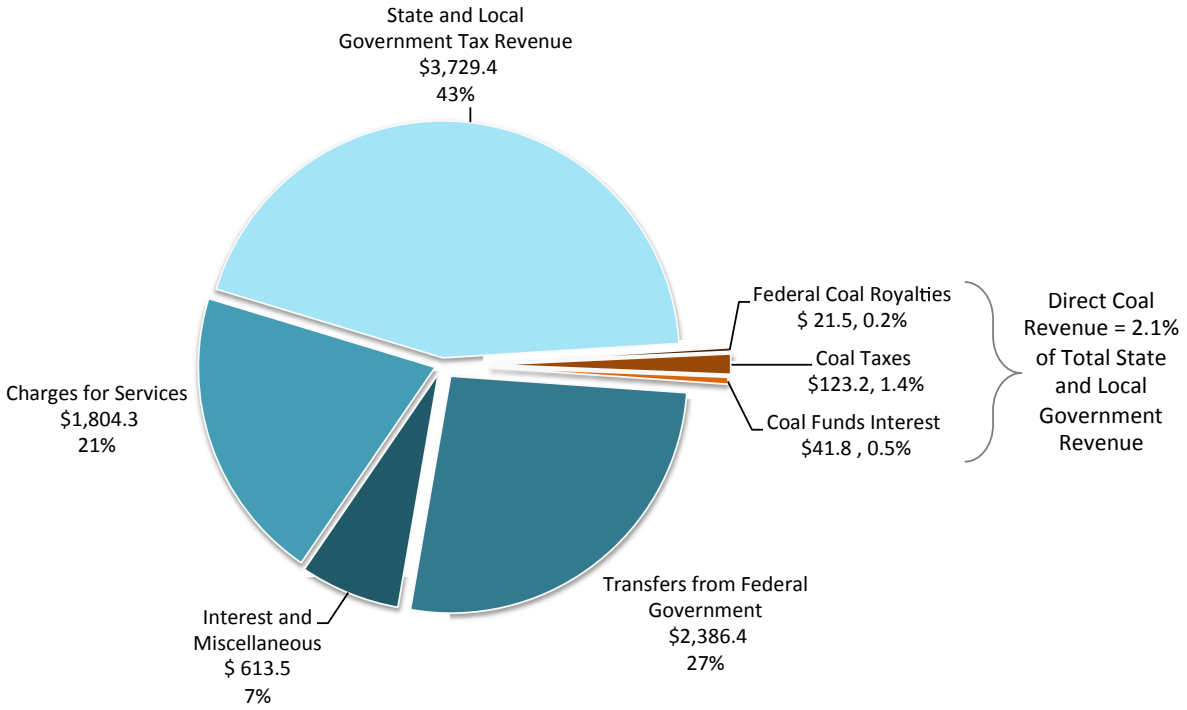
Figure 17: Share of Total Direct Employment, Personal Income, and Tax Revenue Contributed by Coal Mining and Coal-Fired Generation in Montana in 2014.



Source: U.S. Bureau of Labor Statistics; U.S. Department of Commerce. 2015. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C. Table CA05N; Montana Department of Revenue. Note: Personal income from coal employment is estimated using a ratio jobs to personal income of 1:2, the ratio of jobs to personal income earned across the entire mining sector.

Figure 18 shows less than half of total state and local government general revenue is from taxes (44% including coal and non-coal tax revenue). About 27 percent comes from transfers from the federal government, and the rest comes from charges for services and other sources.

Figure 18: Montana Direct State and Local Government Tax Revenue, State and Federal Coal Royalties, and Investment Income from Permanent Coal Savings (Millions of Dollars), 2014.

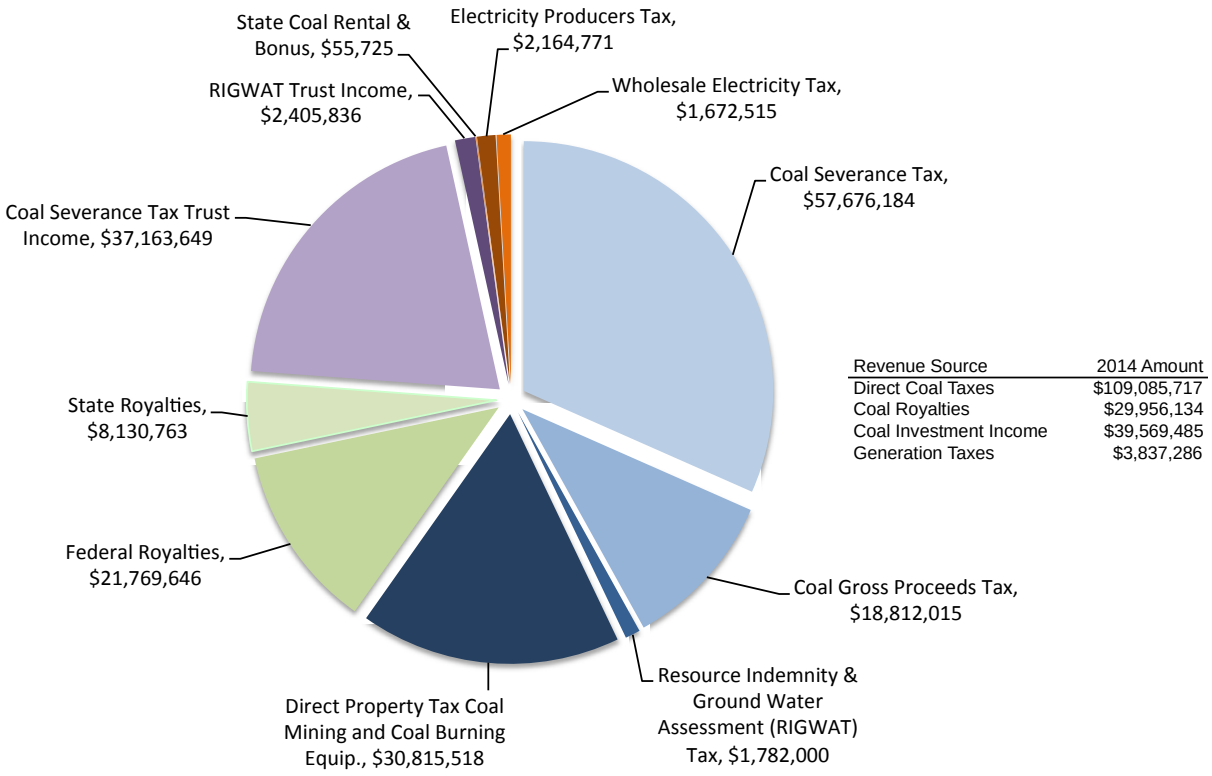


Source: U.S. Census of Governments; Montana Department of Revenue, U.S. Office of Natural Resources Revenue, Montana Board of Investments

Sources of Direct Coal Revenue

Figure 19 shows that the single largest source of coal revenue in 2014 was the coal severance tax ($57.7 million), followed by income earned by the Coal Trust ($37.2 million), which was established and built up by investing half of annual severance tax collections into the permanent Coal Trust. Property taxes on coal mining and coal-generation facilities and business equipment generated $30.8 million, followed by combined federal and state royalties earned from coal mining ($29.9 million in total).

Figure 19: Montana's Direct Coal-Mining and Coal-Fired Generation Tax Revenue 2014.[43]



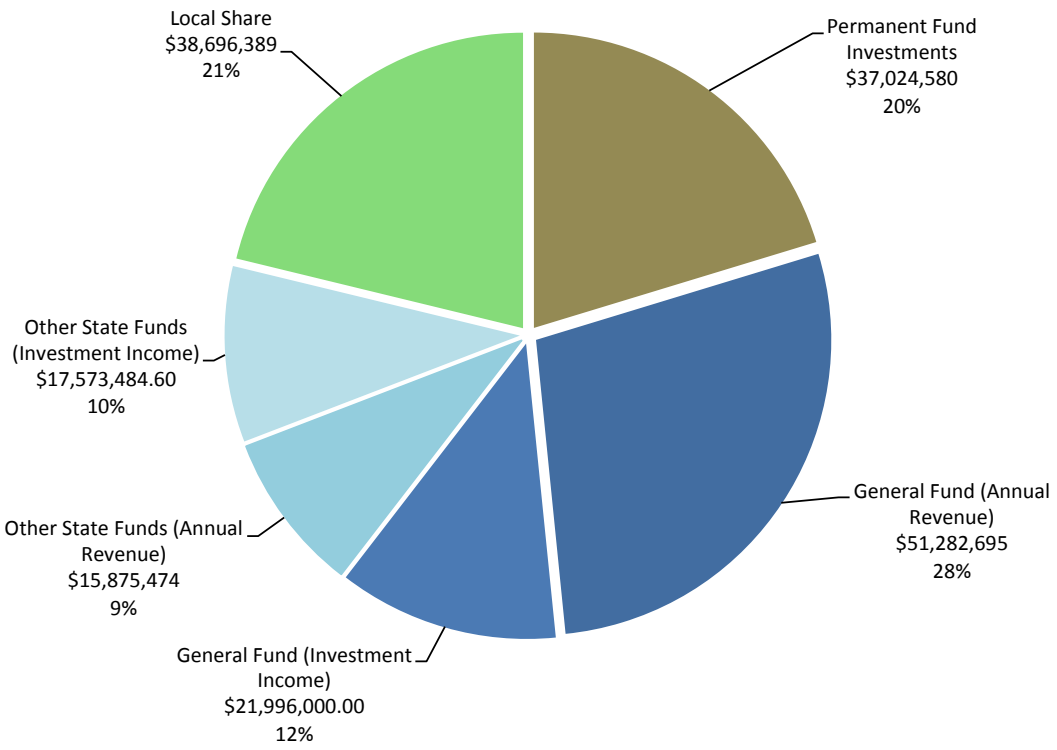
Source: U.S. Census of Governments; Montana Department of Revenue, U.S. Office of Natural Resources Revenue, Montana Board of Investments.

Direct coal taxes include the severance tax, coal gross receipts tax, and property taxes on generation and mining equipment. Royalties are collected by both the federal and state governments that each own a share of Montana's coal. Coal investment income is income earned by investing the principal of the Coal Trust Fund and the Resource Indemnity and Groundwater Assessment Tax Permanent Fund. Montana levies two taxes on electricity generated in the state. The portion of these generation taxes earned from coal-fired generation was estimated based on coal's share of total electricity generation in Montana.

Allocation of Montana Direct Coal Revenue to State and Local Governments and Permanent Savings

Figure 20 shows how income earned on coal mining and generation is allocated between state and local government annual budgets, permanent savings accounts (the Coal Trust and the Resource Indemnity and Groundwater Assessment Trust), and dedicated state funds. Much of the revenue allocated to dedicated state funds is utilized to mitigate the impacts of resource extraction and to fund infrastructure and economic development projects across the state.

Figure 20: Allocation of Direct Coal Tax Revenue, Coal Royalties, and Coal Permanent Trust Investment Income, FY 2014



Source: U.S. Census of Governments. Montana Department of Revenue, U.S. Office of Natural Resources Revenue, Montana Board of Investments.

The state government receives about $67 million in revenue earned from annual production and electricity generation, about one percent of the state's total annual revenue. These are the dollars that would have to be replaced to keep the state's budget whole if coal production and electricity generation slows in part or entirely in the future.

Montana's allocation of revenue to permanent savings reflects Montana's previous experience with mining. In 1975 when the Montana Legislature enacted a severance tax, Governor Tom Judge called the new tax "the most significant piece of legislation enacted in Montana in this century."[44] Later, in considering a challenge to the severance tax, the Montana Supreme Court wrote:

> "Montana's experience had shown that its mineral wealth could be exhausted and exported with little left in Montana to make up the loss of its irreplaceable resources.

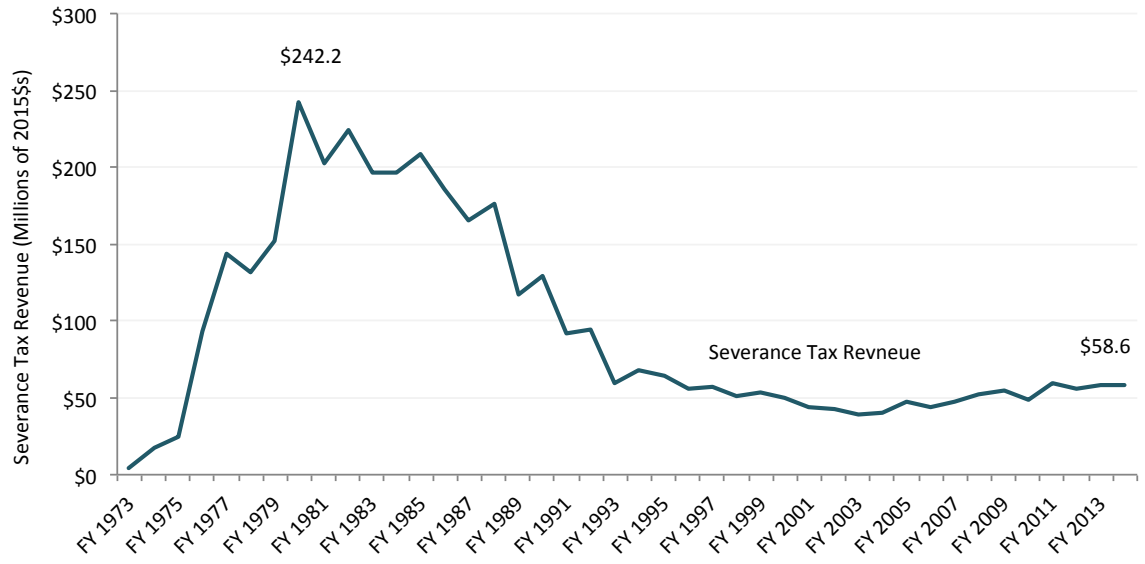
> Montana has been painfully educated about the extreme economic jolts that follow when the mine runs out, the oil depletes, or the timber saws come still. We have a good many examples that teach us what happens to our hills when the riches of our Treasure State are spent. For these and other reasons, when strip coal mining was beginning to burgeon, in 1975, the legislature moved to fix a tax that would provide both for the present and the future when the coal deposits were gone."[45]

A year later, the Montana Legislature supported a constitutional amendment to create the Coal Trust Fund to ensure Montana's resource wealth would be saved for future generations and provide permanent resources for economic development, infrastructure, and to mitigate the community impacts associated with coal mining. Nearly every Western state in the U.S. maintains a permanent fund similarly intended to manage the short-term price and production volatility associated with annual natural resource revenue and to ensure lasting fiscal benefits from the one-time depletion of non-renewable resources.[46]

Montana Severance Tax Revenue Is Declining Due to Lower Coal Prices and Tax Rates

Since the 1970s, Montana's approach to taxing coal has changed. Coal taxes have been weakened in most legislative sessions following the initial severance tax in 1975.[47] As shown in Figure 22, the tax rate (measured as tax revenue as a share of the mine price) has declined from 26.8 percent in 1977 to less than 8 percent today. The decline stems from a variety of production exemptions, tax rate reductions, and incentives for new mining techniques.

Figure 21: Total Montana Severance Tax Revenue (2015 $s)

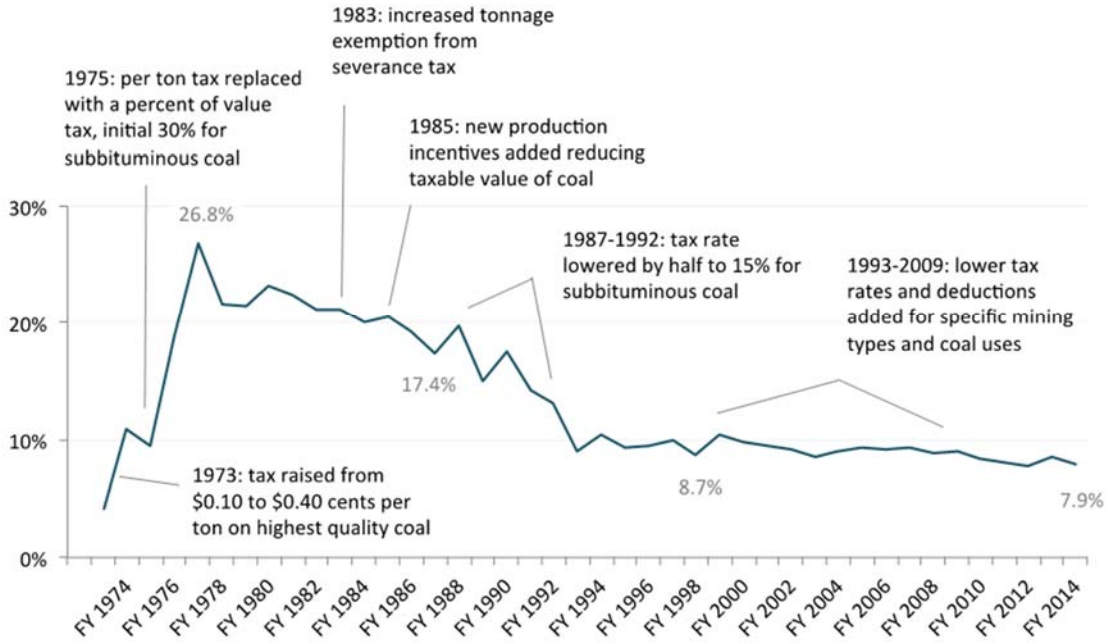


Source: Montana Department of Revenue

Montana's Severance Tax Has Been Weakened Since 1975

The decline in tax revenue associated with changes in Montana's tax policy reduces the state's dependence on coal in some ways (the state receives fewer direct coal tax dollars that it would have to replace if revenues decline in the future). But the decline also limits the resources available in the Coal Trust as well as for local assistance and infrastructure funds that could have been used to help communities during the energy transition.

Figure 22: Montana Severance Tax Revenue as a Percent of Mine Price, 1983-2014



Source: Montana Department of Revenue, Montana Department of Environmental Quality

Four Montana Counties Exposed to Risk of Losing Property Tax Revenue

The four counties that receive the large majority of direct coal revenue are more exposed to declining coal revenue. Rosebud County, for example, maintains a local property tax levy 40 percent lower than the next lowest property tax level of any Montana county (measured as the average levy for the county, municipalities, local schools, county-wide schools, SID's and fees, excluding the state's levy). The average property tax levy for all Montana counties is more than 300 percent higher than Rosebud County's average levy.

Table 4: Local and State Property Taxes from Coal Mining and Coal-Fired Generation Business Equipment

Year	County	Machinery	Furniture and Fixtures	Other Business Equipment	Electrical Generation Prop.	Total Property Taxes	State Share	Local Share
2014	Big Horn	4,065,778	45,748	832,045		4,943,571	551,440	4,392,131
2014	Musselshell	1,692,303	5,286	116,257		1,813,845	286,082	1,527,764
2014	Richland	1,449,115	49,828	2,226,462		3,725,405	905,175	2,820,230
2014	Rosebud	794,782	8,115	148,771	19,381,029	20,332,697	5,862,576	14,470,120
2014	Total	8,001,977	108,977	3,323,535	19,381,029	30,815,518	7,605,272	23,210,246

Source: Montana Department of Revenue. Note: Richland County also has significant valuation in oil and gas business equipment included in the table.

The Colstrip power plant and the Westmoreland mine pay 77 percent of local property taxes in Rosebud County. In Big Horn and Musselshell counties, coal mines pay between a quarter and a third of property taxes directly. Losing all or a portion of this valuation would require these counties to raise tax levies, cut spending, or both.

Revenue generated from coal is, by share, the most important contribution to Montana from coal mining and coal-fired generation. And replacing these revenues will be most difficult for the four counties where these activities are cited. The next section describes what we see as potential outcomes of the energy transition for Montana, and a series of questions intended to help the state prepare for coming changes.

VI. POLICY QUESTIONS FACING MONTANA

Montana's economy is growing and diversifying, driven by an increase in high-wage services jobs and growing investment-related income located in Montana's cities. Seven Montana counties today host two-thirds of all the state's jobs. As a result, Montana as a whole is less dependent on coal mining today than at any time since significant coal mining and coal-fired electricity first ramped-up in the 1970s.

Rural counties without easy access to markets or an educated labor force will not compete as successfully for jobs and income that are boosting the state's cities. Rural communities remain more dependent on natural resources sectors, including coal that is of immense importance in three Montana counties where coal-related activities are concentrated. Dependence on natural resources sectors exposes rural counties to price and market volatility and uncertainty with regard to changing consumer demands and regulations largely outside of Montana's full control.

The profound shift in how and where our economies generate value, jobs, and income represents an opportunity for Montana as a whole, but challenges for parts of the state. While the state overall is likely to experience relatively small impacts from a smaller coal industry in Montana, coal-dependent communities in Eastern Montana are likely to feel the acute effects of job losses and declining tax revenue in the coming decades.

Context related to Montana's changing economy and current trends in the coal sector can help the state understand and respond to changes ahead—changes driven as much or more by market forces or by existing air quality regulations than by potential new carbon regulation. The sooner Montana begins to prepare for ongoing changes in the U.S. economy and energy sector, the more time the state will have to mitigate impacts and capture opportunities from those changes.

Important questions facing Montana's energy future include:

How Will Montana Replace Retired Coal-Fired Energy?

Washington and Oregon states each are moving forward with legislation that would eliminate coal-fired power from their energy portfolios. Montana's position as an energy exporting state offers unique challenges and opportunities. If (or when) Colstrip's capacity is ramped down or retired entirely, can Montana replace the lost power generation capacity with renewable sources of energy that can be exported to consumers in Washington and Oregon, and maintain relatively low rates for Montana's consumers?

What Changes May be Required to State and Local Coal Fiscal Policy?

From the statewide perspective, the continued growth in Montana's economy, the relatively small direct contribution from annual coal revenue, and the increasing income from the Coal Trust make the state resilient to changes in the coal sector. Proposals for increased federal royalty rates could actually increase coal revenue to the state even as production declines. Higher royalty rates would increase revenue per-ton, and roughly half of federal royalties earned in Montana are shared with the state.

By comparison, lower property tax valuations in counties that host coal mining and coal-fired generation will not be so easily replaced. New investments in energy development could offset local property taxes, but most likely these will be located in different jurisdictions (providing new benefits to counties that host these activities, but not offsetting losses in coal-dependent counties). The state should consider changes to fiscal policy, including revisiting tax rates, allocating additional revenue to the Coal Trust (for example,

half of federal royalty revenue), and allocating additional revenue to community impact and transition funds.

What Economic Development and Community Transition Strategies Should be Considered?

Capturing new opportunities in renewable energy can be an economic development strategy for Eastern Montana. However the location of these jobs, the required skills, and other factors mean that coal-dependent communities and workers may not be well-positioned to capture these opportunities.

An economic development and community transition plan should include other options for Colstrip, including carbon capture technology, biomass and other smaller-scale energy projects, in addition to other economic development strategies.

Montana should work with coal communities to develop leadership and community needs assessments to position the state to capture funding available for communities. For example, $55 million was committed by TransAlta Corporation for energy efficiency, community and economic development, and education and worker retraining programs in Washington as part of the Centralia coal-fired plant closure.[48] Federal funding is also available, including the POWER+ Plan, to provide new resources for economic diversification, job creation, job training and other employment services for coal-dependent communities, health care and retirement security for workers, accelerated funds for mine reclamation, and new tax incentives to support continued technology development and deployment of carbon capture, utilization and sequestration technologies.

VII. ENDNOTES

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