IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NORTHWESTERN CORPORATION, d/b/a NORTHWESTERN ENERGY Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and GINA MCCARTHY, Administrator, United States Environmental Protection Agency Respondents.	**No. 15-1378** (Consolidated, Lead Case No. 15-1363)

NORTHWESTERN CORPORATION'S MOTION FOR LEAVE TO FILE A SUPPLEMENTAL DECLARATION IN SUPPORT OF MOTION OF UTILITY AND ALLIED PETITIONERS FOR STAY OF RULE

Pursuant to Fed. R. App. P. 27, Fed. R. App. P. 18, and the inherent equitable authority of the federal courts of appeals, Petitioner NorthWestern Corporation d/b/a NorthWestern Energy ("NorthWestern") respectfully moves the U.S. Court of Appeals for the District of Columbia Circuit ("Court of Appeals" or the "Court") to grant leave for NorthWestern to file a supplemental declaration to the Motion of Utility and Allied Petitioners for Stay ("Utility Motion for Stay" or "stay motion"), filed on October 23, 2015.

The Utility Motion for Stay seeks a stay of the U.S. Environmental Protection Agency's ("EPA") final Rule setting limits for carbon dioxide ("CO_2") emissions from existing fossil fuel-fired power plants (the "Final Rule").[1] NorthWestern submits the supplemental declaration by John Hines and Michael Cashell (the "Hines-Cashell Declaration" or "Declaration") to support the Utility Motion for Stay. The Declaration establishes immediate and irreparable harm to NorthWestern, one of the movants, from the Final Rule. *See* Exhibit 1 — Hines-Cashell Decl.

NorthWestern requests that the Court of Appeals exercise its discretion to allow the supplemental filing of documents in support of motions. Granting NorthWestern's request will benefit the Court by providing a more complete record for ruling on the Utility Motion for Stay and serve the interest of justice by allowing a full account of the irreparable harms that will be caused by the Final Rule. The Hines-Cashell Declaration offers unique facts and analyses for the record and lays out harms from the Final Rule that are specific to NorthWestern, the State of Montana, and the City of Colstrip that are not addressed in declarations filed by other allied petitioners on the Utility Motion for Stay. The Declaration includes detailed analyses of the impacts of the Final Rule on the company's rate-payers and the overall health and welfare of the communities served by

[1] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. 80 Fed. Reg. 64,662 (Oct. 23, 2015).

NorthWestern.

Granting NorthWestern's request to file the Hines-Cashell Declaration also will promote judicial efficiency. NorthWestern could have waited until requisite studies were completed to file an individual motion to stay and the Hines-Cashell Declaration. This would have resulted in redundant pleadings and presentations of the Final Rule's fundamental legal flaws. To ensure swift and efficient resolution of the stay motion and avoid repetitious filings, NorthWestern elected to join the Utility Motion to Stay and subsequently file this request to supplement the motion as soon as possible. Further, NorthWestern is filing the Hines-Cashell Declaration within the time frame the Court has established for filing additional motions for stay, which otherwise could include such declarations.

In exercising its discretion, NorthWestern urges the Court to consider the length and complexity of the Final Rule and the challenges facing NorthWestern. NorthWestern began conducting extensive and complex analyses of the Final Rule shortly after EPA issued the 1,500 page pre-publication version of the Rule, and lengthy technical support documents, on August 3, 2015. The Final Rule imposes an emissions reduction target for the State of Montana (where the Colstrip power plant, in which NorthWestern has an interest, is located) that is significantly more stringent than the State target that was set in the proposed rule. *See* 79 Fed. Reg. 34,829 (June 18, 2014). As a result of this drastic increase — *the steepest for any*

state — NorthWestern was compelled to start many of its system-wide analyses from scratch. These analyses included projections of the impacts of the Final Rule on the company's future total portfolio *(e.g.*, the potential to replace lost coal generation with natural gas and renewable energy generation and the associated transmission requirements) and the effect of these projections on NorthWestern and the communities it serves. Hines-Cashell Decl. ¶¶ 40-63.

Additionally, NorthWestern has been awaiting the results of an update to a 2010 study by Professors at the University of Montana on the impacts of the Colstrip power plant to state, regional, and local economies. This update was commissioned by NorthWestern soon after the Final Rule was issued and not completed until Tuesday, November 3, 2015. The updated study's findings enhanced NorthWestern's understanding of the Final Rule's harm to NorthWestern's customers in Montana and the City of Colstrip and informed critical aspects of the Hines-Cashell Declaration. *See, e.g.*, Hines-Cashell Decl. ¶¶ 54-65. For this reason, the Hines-Cashell Declaration could not be finalized before the study was completed and, thus, could not be filed on October 23, 2015 with the Utility Motion for Stay.

For the foregoing reasons, NorthWestern respectfully requests that the Court of Appeals grant leave to file the enclosed declaration of John Hines and Michael Cashell to support the Utility Motion for Stay.

November 5, 2015

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, on this 5th day of November, 2015, I caused the foregoing Motion for Leave to File Supplemental Declaration in Support of Motion of Utility and Allied Petitioners for Stay of Rule to be served on counsel of record in this case by means of the Court's CM/ECF system.

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DECLARATION OF JOHN D. HINES AND MICHAEL R. CASHELL

We, John D. Hines and Michael R. Cashell, together have personal knowledge of and are competent to testify to the matters set forth herein. We hereby declare the following:

1. I, John D. Hines, am Vice President -- Supply for NorthWestern Corporation, a Delaware corporation, doing business as NorthWestern Energy ("NorthWestern"). In that capacity, I am the officer responsible for overseeing the functional areas of electric and natural gas planning, generation, energy marketing, and the company's lands and permitting and

environmental compliance functions. None of the declarations herein related to electric transmission are mine

2. I, John D. Hines, joined NorthWestern in January 2005 as Director of Energy Supply Planning, became the Chief Energy Supply Officer in January 2008, and have served as Vice President – Supply since May 2011.

3. I, John D. Hines, earned a B.A. and a Master's Degree in Economics from the University of Montana. I have over 25 years' experience in the energy sector, including working as a consultant to public interest groups on energy issues and as an economist for the Northwest Planning and Conservation Council ("Council").

4. In 2002, Governor Judy Martz appointed me, John D. Hines, to serve as one of Montana's two representatives to the Council, where I served on the Council's Executive Committee and Power Committee.

5. I, Michael R. Cashell am Vice President -- Transmission for NorthWestern. In that capacity, I am the officer responsible for all electric transmission and substations and natural gas transmission and storage for NorthWestern. The declarations herein related to electric transmission are mine alone.

6. I, Michael R. Cashell, joined NorthWestern's predecessor, The Montana Power Company ("Montana Power"), in 1986 as an Engineer. In 2002, NorthWestern acquired the Transmission and Distribution assets of Montana

Power, and I joined NorthWestern at that time, serving in various capacities in the transmission area. I have served as Vice President – Transmission since May 2011.

7. I, Michael R. Cashell, earned a Bachelor's Degree in Engineering Science from Montana Tech of the University of Montana. I have over 29 years' experience in the electric and gas utility industry.

8. In this declaration, we identify immediate and irreparable harms to NorthWestern's customers and electric generation and transmission system if a stay is not granted of the U.S. Environmental Protection Agency's ("EPA") final rule ("Final Rule" or "Rule") titled *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units*, 80 Fed. Reg. 64,662 (Oct. 23, 2015).

INTRODUCTION TO NORTHWESTERN ENERGY AND THE COLSTRIP PLANT

9. NorthWestern is an investor-owned utility company that owns and operates electric generation, transmission, and distribution systems providing electricity to approximately 422,900 customers in Montana, South Dakota, Nebraska, and Yellowstone National Park. NorthWestern also owns and operates natural gas production, transmission, and distribution systems serving approximately 257,063 customers in Montana, South Dakota, and Nebraska. In Montana, NorthWestern's electric distribution service territory

spans approximately 107,600 square miles, or over 70 percent of the state's land area, and serves around 342,000 customers in 187 different communities.

10. NorthWestern's carbon emissions from its existing energy supply portfolio are already below the EPA's 2030 requirements because of recent, substantial investments in renewable generation. In total, NorthWestern's owned and contracted renewable generation resources in Montana provide 751 MW of capacity.

11. NorthWestern is both committed and required by statute to reliably deliver electricity to its customers at reasonable prices. As detailed in this declaration, the Final Rule is harming and will continue to harm NorthWestern's ability to meet this requirement, which will irrevocably injure NorthWestern and the roughly 342,000 customers in Montana who depend on NorthWestern to reliably deliver responsibly-produced electricity at reasonable prices.

12. In 2014, NorthWestern's peak demand in its Montana electric retail service territory was between 1,150 MW and 1,170 MW, with an average hourly demand of 750 MW. NorthWestern-owned generation resources supply approximately 68 percent of its electric energy requirements. The rest of NorthWestern's customer load requirements are met through power

purchase contracts with third parties, including contracts with wind, solar, and hydroelectric (water) generators.

13. NorthWestern's owned electric generation fleet serving Montana includes water, wind, natural gas, and coal-fired facilities. NorthWestern owns and operates ten hydroelectric generating facilities, all of which are located in Montana, that have a combined net capacity of 439 MW. NorthWestern also owns and operates a wind facility, located in Montana, with a nameplate capacity of 40 MW. In addition, NorthWestern owns a 150 MW natural gas-fired facility, located in Montana that is necessary for integrating wind resources (including those supplied by third parties) into the electricity grid. Finally, NorthWestern owns a minority interest in the Colstrip Generating Station, which consists of four coal-fired electric generating units ("EGUs"), located in Colstrip, Montana (the "Colstrip Plant"). NorthWestern's interest in the Colstrip Plant provides 222 MW of capacity to NorthWestern, with the balance of the facility's capacity (about 1,872 MW) going to the other owners.

14. Besides its owned generation in Montana, NorthWestern has long term power purchase agreements with (a) 16 hydroelectric projects providing a combined 44 MW of capacity, (b) 15 wind projects with a combined 222

MW of capacity, and (c) two solar projects with a combined 5 MW of capacity.

15. NorthWestern jointly owns, operates, and maintains a 500 kilovolt ("kV") transmission system (the "Colstrip Transmission System") that transfers electricity from the Colstrip Plant to markets both within Montana and in states located to the west of Montana. NorthWestern is the designated operator of the Colstrip Transmission System. NorthWestern's transmission infrastructure has interconnections to five major nonaffiliated transmission systems in the Western Electricity Coordinating Council area, as well as one interconnection to a system that connects with the Mid-Continent Area Power Pool region. Importantly, the Colstrip Transmission System transmits electricity to substations and to the underlying in-state transmission and distribution system that delivers electricity to NorthWestern's retail, large industrial, and electric cooperative customers in Montana.

16. NorthWestern's electricity infrastructure in Montana includes about 17,500 miles of overhead and underground distribution lines, as well as about 6,900 miles of transmission lines and associated terminal facilities that extend through the western two-thirds of Montana.

17. Many of the communities in NorthWestern's electric service territory in Montana are low-income and rural. According to U.S. Census Bureau data, average yearly per capita income in Montana for 2009-2013 was $25,373, about 10 percent below the national average of $28,155. Median household income was $46,230, about 13 percent below the national average of $53,046. The State of Montana is characterized by a large land area and low population densities. According to U.S. Census Bureau data, the average number of persons per square mile in Montana for 2010 was 6.8. This is more than 90 percent below the national figure of 87.4 persons per square mile. In Rosebud County, where the Colstrip Plant is located, the figure is 1.8 persons per square mile -- about 98 percent below the national figure. Because of the size of NorthWestern's service territory and its rural makeup, fewer customers share the costs of NorthWestern's energy infrastructure. Thus, the burden of any increase in electricity prices necessitated by the Final Rule will be magnified for NorthWestern's customers.

18. The Colstrip Plant is a 2,094 MW coal-fired base-load electric generating facility located near the City of Colstrip in Rosebud County in southeastern Montana. The Colstrip Plant consists of four separate coal-fired steam generating units. Units 1 and 2 were built in the 1970s, and each has a net generating capacity of about 307 MW. Units 3 and 4 were built in the

1980s, and each has a net generating capacity of about 740 MW. The other owners of the Colstrip Plant include Talen Energy, Puget Sound Energy, Inc., Portland General Electric Company, Avista Corporation, and PacifiCorp. Since the final unit, Unit 4, came online in 1986, the Colstrip Plant has continually provided power to Montana and other locations in the Pacific Northwest.

19. NorthWestern does not have an ownership interest in Colstrip Units 1, 2, or 3. NorthWestern has a 30 percent ownership interest in Colstrip Unit 4, and has a sharing agreement in Unit 3 with Talen Energy, so that effectively Talen and NorthWestern each have a 15 percent interest in the output of Unit 3 and a 15 percent interest in the output of Unit 4.

20. Colstrip is located within about 20 miles of two American Indian Reservations: the Northern Cheyenne Indian Reservation south of Colstrip in Rosebud County and the Crow Indian Reservation southwest of Colstrip in neighboring Big Horn County. These tribes and their members contribute substantially to the work force at the Colstrip Plant and the Rosebud Mine that supplies coal to the plant. According to the Senate testimony of a Northern Cheyenne Tribal member, members of the Northern Cheyenne Tribe make up about one-third of the mine's workforce and about one-eighth of the plant's work force. *See Written Testimony of Jason Small, Northern*

Cheyenne Tribal Member & Journeyman Boilermaker, Local 11, Montana HC 42, Box 560, Busby, MT: Field Hearing Before the Senate Committee on Indian Affairs, "Empowering Indian Country through Coal, Jobs & Self Determination" (Apr. 8, 2015) (statement of Jason Small) at p.3.[1]

21. As of 2012, the Colstrip Plant's electricity output constitutes around 85 percent of the state's total coal-fired electricity supply. In 2014, the Colstrip Plant provided about 36 percent of the total electricity generating capacity located in Montana.

22. Nearly all of the fuel supply for the Colstrip Plant's current production is supplied by coal from the Rosebud Mine, a roughly 25,000 acre surface mine complex near the City of Colstrip. The mine opened in 1968 and has generally been in active operation ever since. The Colstrip Plant was specifically designed to burn coal from the Rosebud mine, which has three active pits adjacent to the Colstrip Plant. The Rosebud Mine has an average annual production of 12.3 million tons of coal. It is currently owned by Western Energy Company ("WECO").

SUMMARY OF THE FINAL RULE

23. Nationwide, the Final Rule requires a 32 percent reduction in carbon dioxide

[1] Available at http://www.indian.senate.gov/sites/default/files/upload/files/4.8.2015%20SCIA%20Witness%20Testimony%20-%20Jason%20Small.pdf.

("CO_2") emissions from 2005 levels by 2030. Although Montana contributes less than one percent of the nation's power plant CO_2 emissions, Montana must achieve a disproportionate amount of the reductions mandated by the Final Rule. Montana only contributes about 0.85 percent of all carbon emissions produced nationwide by the units affected by the Final Rule, but must reduce its mass emissions by 41 percent from baseline levels. These drastic reductions will result in just a 0.35 percent reduction in carbon emissions nationwide.

24. The Final Rule establishes, for two subcategories of EGUs, nationwide emission performance rates, described as pounds ("lbs") of CO_2 per net megawatt hour ("MWh") of electricity generated. The performance rate for the first subcategory, which includes coal-fired EGUs, like the Colstrip Units, is 1305 lbs CO_2/MWh. The performance rate for the second subcategory, which includes natural gas combined cycle ("NGCC") units, is 771 lbs CO_2/MWh.

25. By EPA's own admission, existing units, like the Colstrip Units, cannot meet the new performance rates through any technological or operational changes at the unit and would be required to (i) curtail their generation or shutter their plants, (ii) shift their generation to lower-emitting sources, or (iii) purchase credits or allowances under a (potential) future trading

program.

26. EPA also converted these subcategory-specific performance rates into statewide standards for each state. EPA expresses these standards in "rate" form (lbs CO_2/MWh) and "mass" form (expressed in short tons). EPA calculated these state standards by applying a weighted average of the individual performance rates to each state's existing fleet of coal-, gas- and oil-fired power plants.

27. For Montana, (i) the final rate-based CO_2 emission performance standard for 2030 is 1,305 lbs CO_2/MWh (compared to a baseline rate of 2,481 lbs CO_2/MWh for 2012), for a 47.4 percent CO_2 emissions rate reduction target, and (ii) the final mass-based standard for 2030 is 11,303,107 short tons of CO_2 (compared to an adjusted baseline level of 19,147,321 short tons of CO_2 for 2012), for a 41 percent CO_2 mass-based emissions reduction target.

28. The final state standards must be met by 2030. In addition to the 2030 final standards, the Final Rule sets increasingly stringent interim standards for the 2022 to 2029 compliance period. States and individual units must meet both the interim and final requirements or face corrective EPA action.

29. Under a rate-based program, Montana must achieve an average interim emission rate of 1,534 lbs CO_2/MWh over the eight years from 2022 to 2029. Montana must reduce emissions to (i) 1,671 lbs CO_2/MWh in 2022-

2024 (Interim Step 1); (ii) 1,500 lbs CO_2/MWh in 2025-2027 (Interim Step 2); and (iii) 1,380 lbs CO_2/MWh in 2028-2029 (Interim Step 3).

30. Under a mass-based program, Montana must achieve an interim emission limit of 12,791,330 short tons per year, averaged over the years 2022 to 2029. Montana must reduce average annual emissions to (i) 13,776,601 short tons of CO_2 in 2022-2024 (Interim Step 1); (ii) 12,500,563 short tons of CO_2 in 2025-2027 (Interim Step 2); and (iii) 11,749,574 short tons of CO_2 in 2028-2029 (Interim Step 3).

31. States must formulate state compliance plans and submit those plans to EPA for approval. EPA allows states the option to allow trading of emission rate credits or "ERCS" (under a rate-based compliance plan) or allowances (under a mass-based system), subject to certain restrictions. Critically important to NorthWestern, renewable generation constructed before 2013 cannot be used for compliance under an emission rate plan.

32. States must submit a state plan to EPA by September 6, 2016, less than 10 months from now, or request an extension. If the state meets certain requirements and is granted an extension, the state must submit a progress report in 2017 that contains substantially all of the final plan components and submit its plan to EPA by September 6, 2018.

33. EPA has stated that it will review and approve or disapprove final state

plans. Thus, regulated entities like NorthWestern are unlikely to know their full compliance obligations until 2019.

34. Despite this uncertainty, States and regulated entities like NorthWestern must immediately begin planning and implementing compliance measures at significant costs that ultimately will be borne by consumers.

THE FINAL RULE HARMS NORTHWESTERN

35. Colstrip Units 1-4 likely cannot meet the Final Rule's unit-specific performance rate, and Montana cannot meet its state-wide standards, without prematurely retiring the Colstrip Units, or implementing measures that likely will make the continued operation of any of the Colstrip Units economically infeasible.

36. Despite the significant uncertainty regarding Montana's ultimate plan for complying with the Final Rule, NorthWestern must immediately begin planning for compliance and already has experienced and will continue to experience harm from the planning decisions compelled by the Final Rule.

37. These harms directly impact NorthWestern's customers, who already are shouldering the financial burden of NorthWestern's early and substantial investments in renewable and low-carbon generation.

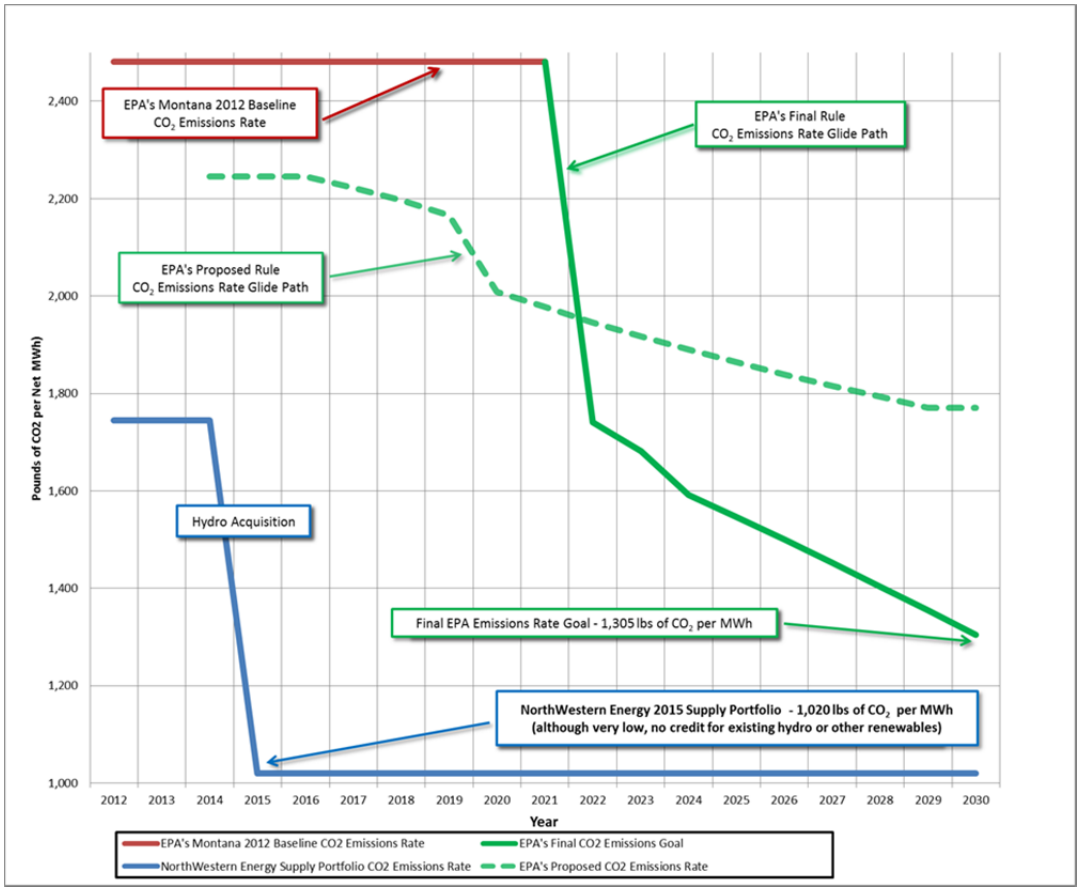
A. Harm to NorthWestern's Customers

38. The Final Rule is especially punitive for NorthWestern because the

NorthWestern system already has achieved the CO_2 emission rate targets for Montana set by the Final Rule. The Final Rule's arbitrary focus on state boundaries and failure to recognize existing renewable generation have the absurd result of requiring NorthWestern's customers to finance additional emissions reductions that go beyond the targets set by EPA.

39. NorthWestern's present supply portfolio, measured by delivered power, is comprised of nearly 60 percent carbon-free renewable generation resources. In the seven years prior to EPA's rulemaking, NorthWestern developed a diverse set of generation assets to provide a cost-effective, reliable, and environmentally sound electricity portfolio.

40. As the chart below shows, the carbon emissions of NorthWestern's portfolio are well below the Final Rule's nationwide emission reduction target (32 percent from 2005 levels). With an emissions rate of about 1,020 lbs CO_2/MWh, NorthWestern's generation portfolio is already in compliance with EPA's 2030 emissions rate requirement.



41. The Rule provides no credit for NorthWestern's proactive actions in developing its balanced and reliable portfolio. Although NorthWestern's customers already have paid and continue to pay – over one billion dollars – for these significant carbon emission reductions, the Final Rule will burden NorthWestern's customers with substantial additional compliance costs to improve Montana's emissions portfolio.

42. The reductions required of Montana by the Final Rule are severe. Under a rate-based plan, Montana must reduce its emissions rate 47.4 percent from 2012 levels. Under a mass-based plan, Montana must reduce its CO_2 mass-

based emissions 41 percent by 2030 (compared to a nationwide 26 percent mass reduction requirement, based on EPA's 2012 baseline figures).

43. The Colstrip Plant cannot meet the Final Rule's performance rate for existing coal-fired plants. Under the Final Rule, Colstrip would be permitted to emit no more than 1,305 lbs CO_2/MWh-net annually. Over the past five years, Colstrip has emitted CO_2 at an average annual rate of 2,351 lbs CO_2/MWh-net, which is over 1,046 lbs more per MWh-net than permitted by the Rule. By themselves, Colstrip's coal-fired EGUs cannot meet the applicable emissions rate, and there is no known, commercially available technology that can be applied to the EGUs to enable them to meet the standard.

44. It is clear that operation of the Colstrip Plant cannot continue as it exists today under the Final Rule, regardless of whether Montana adopts a rate-based or mass-based program. To achieve compliance under a rate-based program, Colstrip must cease operation in 2022. To achieve compliance under a mass-based program, the Colstrip Plant has only two options for complying with the Final Rule: (1) shut down; or (2) severely curtail its operations and purchase allowances from out-of-state energy resources. Even under the second compliance option (a combination of curtailed operation and allowance purchases), the Colstrip Plant is likely to have to

shut down as it would no longer be economical to operate. According to EPA data, the Colstrip Plant emitted about 14.8 million short tons of CO_2 in 2012. Assuming a proportionate allocation of allowances, Colstrip would be entitled to about 10.3 million allowances in 2022, declining to about 8.1 million allowances in 2030. EPA's projection of allowance prices is around $13 per ton. While NorthWestern believes allowances will likely be more costly than the EPA projection, assuming EPA's projected allowance price, Colstrip would need to spend over $100 million each year to operate at 2012 levels by 2030. It is unlikely that the Colstrip Plant, or any power plant in the country, could operate with that level of extra cost. Furthermore, the need to purchase such a significant number of allowances would cause a wealth shift to out-of-state generators that directly compete with the Colstrip Plant, and will benefit out-of-state consumers while imposing costs on Montana consumers. For these reasons, the Final Rule is likely to result in the premature retirement of the Colstrip Plant under either of the potential compliance pathways.

45. The uncertainty regarding the continued operation of the Colstrip Plant has resulted and will continue to result in irreparable harm to NorthWestern's customers, particularly in Montana.

46. The uncertainty created by the Final Rule already has negatively affected the

terms and tenor of the coal contract currently under negotiation by NorthWestern and the other owners of the Colstrip Plant, resulting in higher electric rates for NorthWestern's customers. Prior to issuance of the Final Rule, NorthWestern and the other Colstrip Plant owners were engaged in negotiations to replace the unit's existing coal supply contract, which expires in 2019, with a new contract with lower overall costs. The new contract would have gone into effect prior to the expiration of the 2019 contract and resulted in benefits for NorthWestern's customers. Because the Final Rule creates uncertainty regarding the survivability of the Colstrip Plant, NorthWestern now must incorporate into the contract negotiations the additional risks posed by the potential premature closing of the Colstrip Plant. Incorporation of these risks will increase the overall costs associated with the contract, lessening or eliminating the benefits the contract otherwise would have provided for NorthWestern's customers.

47. The premature shutdown of the Colstrip Plant will burden NorthWestern's customers with the cost of building replacement generation. NorthWestern would not be able to fill the hole in its portfolio left by Colstrip entirely with intermittent renewable energy resources and power purchases. Intermittent renewable generation must be supported by a reliable power source, and power purchases are risky because power may not be available for purchase

and the market price fluctuates drastically. Instead, NorthWestern would have to build a new natural gas-fired plant to provide reliable baseload power. Rough estimates of constructing a 300 MW NGCC plant, excluding the cost of natural gas and electric transmission infrastructure, is about 330 million dollars. The costs of building a 100 MW simple cycle natural gas plant, combined with a 330 MW wind project, again excluding transmission infrastructure, is around 100 million dollars for the gas plant and 654 million dollars for the wind project. Moreover, the lead time to construct new generation and associated transmission requires NorthWestern to start the development process now to ensure it is online by 2022. It takes roughly three years to permit and construct natural gas facilities and far longer to permit and construct transmission infrastructure. Siting of linear transmission facilities (electric or gas) can be a very time consuming, costly, and controversial process. If the Final Rule is not stayed but is implemented and later vacated by the Court, NorthWestern will have already incurred substantial and unrecoverable costs.

48. The premature shutdown of the Colstrip Plant will increase the cost of power purchases for NorthWestern's Montana customers. Currently, Montana is a surplus power state, which is a tremendous benefit to NorthWestern's customers. If NorthWestern purchases power, it is able to do so at less than

market rates and does not have to pay full transmission costs. If the Colstrip Plant closes, NorthWestern will have to pay higher market rates to purchase power, as well as higher transmission costs to bring the power to Montana. These issues will be exacerbated during peak periods of extreme weather, which occur in both the winter and summer in Montana.

49. The Final Rule has the potential to catastrophically affect NorthWestern's industrial customers. There simply will not be enough firm power available in Montana from existing sources for these industrial customers. These customers will be forced to purchase firm power from places outside Montana and will need to cover the cost of transmission to get that power delivered to their facilities in Montana, increasing the costs they incur operating in Montana.

50. The premature shutdown of the Colstrip Plant will affect the reliability of the Colstrip Transmission system. Coal-fired generation provides power that is reliable, consistent, and predictable. Therefore, the loss of all coal-fired generation on NorthWestern's transmission system could severely inhibit NorthWestern's ability to export, import, or move electricity through the system. This would cause the transmission system to be much less reliable, at least without other, potentially very costly, investments, such as additional generation and new transmission lines. Most importantly, NorthWestern's

overall transmission system would be more susceptible to cascading outages (i.e., "black-outs") following system disturbances if all coal-fired generation were shut down and either (a) not replaced or (b) replaced with only wind or solar generation. Additional wind or solar generation added to the transmission system would require an investment in balancing reserves (i.e., back-up power like natural gas-fired units) due to the intermittent nature of the resource.

51. The premature shutdown of the Colstrip Plant will increase transmission costs for NorthWestern's customers. First, if the Colstrip Plant stops production, under the terms of the Colstrip Transmission Agreement, NorthWestern may be compelled to either (a) purchase the Colstrip Transmission System from the other owners or (b) decommission the Colstrip Transmission System. Second, if the Colstrip Plant is closed, the Bonneville Power Administration would have the right to remove its transmission line that connects into the Colstrip Transmission System. The Bonneville Power Administration's connection carries power from the Colstrip Transmission System into the state of Washington. If the connection is removed, it would leave the Colstrip Transmission System as a transmission line that leads to nowhere. Third, as discussed above, without the Colstrip Plant NorthWestern likely would need to develop additional

generation and/or import power to serve local load. In either circumstance, new and costly transmission infrastructure may be needed to deliver the power to NorthWestern's customers.

52. The cost and lead time needed to design, site, permit, and build electric transmission is significant, as is best illustrated by NorthWestern's experience in its efforts to design, site, permit, and build a 500 kV electric transmission project, known as the Mountain States Transmission Intertie (MSTI). In 2004, NorthWestern initiated efforts to build MSTI, a 500 kV transmission system from near Townsend, Montana, to southwest Idaho -- a distance of approximately 300 miles. Following routing evaluation and other study, NorthWestern applied for the necessary permitting in 2006. Subsequently, NorthWestern encountered substantial opposition from a number of stakeholders, including landowners over whose property the transmission might likely be located and local government entities. This led to a lawsuit, filed in 2010, and an appeal to the Montana Supreme Court, all finally decided in 2011. Ultimately, in 2012, NorthWestern elected to abandon the project as result of delays caused by this opposition, delays in obtaining the necessary environmental impact statement (at that time, the draft environmental impact statement had yet to be issued), and changes in market conditions. Overall, NorthWestern incurred costs of approximately

24 million dollars in its pursuit of the MSTI project, and eight years passed without ever reaching final permitting, let alone constructing the transmission line.

53. NorthWestern roughly estimates that building a 230 kV electric transmission line, including right-of-way acquisition and construction costs, could run at least $750,000 per mile -- a significant sum, given Montana's large geographic size. Based on its experience with the MSTI project, NorthWestern further estimates that a new electric transmission system -- which would be necessary to address the significant problems caused by closing the Colstrip Plant or to support new natural gas or renewable generation -- would likely not be permitted, let alone built and operational, before 2023.

B. Harm to the State and Local Community

54. According to a 2010 study authored by Patrick M. Barkey, Ph.D. and Paul E. Polzin, Ph.D ("2010 Study"), entitled *The Economic Contribution of Colstrip Steam Electric Station Units 1-4*, the Colstrip Plant is the largest industrial facility in the state. *See* 2010 Study at p.3 (attached as Exhibit A). A recent November 2015 study also authored by Drs. Barkey and Polzin of the University of Montana's Bureau of Business and Economic Research ("2015 Study"), entitled *The Economic Implications of Implementing the*

EPA Clean Power Plan in Montana -- Preliminary Draft, confirms this. *See* 2015 Study at p.1 (attached as Exhibit B). While the 2015 Study is labeled as a preliminary draft, the analysis supporting its conclusions is final.

55. The 2010 Study concluded that the economy of Montana is "larger, more prosperous and more populous because of the operations of Colstrip." 2010 Study at p.2 (Ex. A). The 2010 Study estimates that the Colstrip Plant provides approximately 3,740 jobs (including more than 2,600 private sector jobs) throughout Montana, including about seven percent of all jobs in eastern Montana. In addition, the 2010 Study estimated that coal-related income generates around 360 million dollars in personal income for Montana residents. The 2010 Study also found that the Colstrip Plant's operations contribute about 638 million dollars to the state's annual Gross Domestic Product ("GDP"), with tax revenues tied to the Colstrip Plant's operations making up about 4.5 percent (or nearly 104 million dollars) of the State's total revenue collections. About 12 million dollars of this total is distributed to school districts across the state. 2010 Study at p.2 (Ex. A).

56. Coal mining and electricity production, along with agriculture, are the main industries and primary economic drivers in Rosebud County and the surrounding region. The Colstrip Plant is the principal employer for the City of Colstrip, directly providing over 360 jobs. The Colstrip Plant also

supports other coal-related occupations, such as mining, that employ a large percentage of the population. The Rosebud Mine alone employs about 240 people.

57. In 2013, the City of Colstrip had a population of approximately 2,314 people. In 2015, the population was 1,415 people. Although the poverty rate in Rosebud County is higher than the national average (17.3 percent, compared to 15.2 percent, for 2009-2013), the City of Colstrip has a relatively high average per capita income of $34,297 and an average median household income of $83,427, about 40 percent higher than the statewide average median household income of $46,972 (all 2013 figures). The relatively high incomes enjoyed by Colstrip residents are a result of the jobs that the Colstrip Plant supports. The 2010 Study found that Colstrip's operations help establish wages and benefits more than three times greater than average for Eastern Montana. 2010 Study at p. 2 (Ex. A).

58. The Colstrip Plant is the largest taxpayer in Rosebud County, and the Colstrip Plant's local property and natural resource taxes provide the City of Colstrip and Rosebud County with a comparatively large tax base, along with some of the lowest tax rates in the state. This large tax base creates a number of quality of life benefits for Colstrip residents, including high-quality schools, infrastructure, parks, and public services. Colstrip averages

one park for every 100 residents and contains a trail system that connects the entire community. Sports Illustrated Magazine named Colstrip the top sports town in Montana in its 50th anniversary edition. Colstrip has also received national awards for city planning and engineering. Without the jobs and tax base provided by the Colstrip Plant and the Rosebud Mine, City of Colstrip and Rosebud County residents would not enjoy these economic and quality-of-life benefits.

59. If the Final Rule goes into effect, employees of the Colstrip Plant and other residents of the City of Colstrip and surrounding Rosebud County whose livelihoods depend on the Colstrip Plant will know that the Colstrip Plant's units will likely be shut down. This will have immediate and severe impacts on the job market, housing values, and tax base for the City of Colstrip and neighboring Rosebud County. These effects will be felt long before the Final Rule's interim and final standards must be met.

60. The Final Rule will make it difficult, if not impossible, to create and fill job positions at the Colstrip Plant in the near term. Currently, 20-25 of the approximately 360 job positions at the Colstrip Plant are not filled. Qualified employees are unwilling to come to work for and/or continue to work for a facility whose operations stand to be curtailed or shut down entirely. In addition, many members of the Colstrip Plant's active work

force are nearing retirement age. As these workers retire, more positions will become vacant that the Colstrip Plant will not be able to fill.

61. Since the Colstrip facility is the City of Colstrip's major employer and Rosebud County's largest taxpayer, the tax base for Rosebud County could be virtually wiped out by the closure of the Colstrip Plant. The loss of this tax base will eliminate many of the quality of life benefits, including a well-funded school system, currently enjoyed by Colstrip residents.

62. The loss of the Colstrip Plant will affect Montana's ability to attract and retain other industrial businesses. Closure of the Colstrip plant will convert Montana from a power surplus state to a power deficit state, which will result in higher power costs for NorthWestern's industrial customers. Higher power costs will increase the cost of industrial operations and productions and create a powerful incentive for existing industrial business to relocate and for new industrial businesses to locate elsewhere. Loss of these businesses would be a significant blow to Montana's economy.

63. Shutting down the Colstrip Plant will result in a loss of critical tax revenue for the entire state -- not just Rosebud County. The 2010 Study estimated that Colstrip operations contribute approximately 104 million dollars in state and local taxes each year. 2010 Study at p.2 (Ex. A). Shutting down the Colstrip Plant would have direct and immediate economic cost repercussions

throughout the entire state.

64. The 2015 Study found that implementation of the Final Rule will mean the following for Montana: (1) the loss of more than 7,100 high paying jobs by 2025, spread across a wide range of industries (including local government jobs that are supported by the significant property tax bills paid by Colstrip facilities); (2) the loss of over half a billion dollars in annual income received by Montana households; (3) a more than 1.5 billion dollar decrease in sales realized by Montana business and other organizations; and (4) a statewide population loss of over 10,000 people. 2015 Study at pp.2-9 (Ex. B).

65. The 2015 Study describes the Final Rule as the "most significant economic event to occur in Montana in more than thirty years." 2015 Study at p.1 (Ex. B). The 2015 Study further states that the resulting decline of a half billion dollars in personal income statewide from the Final Rule is roughly half as large as the decline in personal income Montana experienced in the Great Recession in 2009. 2015 Study at p.6 (Ex. B).

Pursuant to 28 U.S.C. § 1746, I declare under the penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed: November 5, 2015

By: _____
Michael R. Cashell

By: _____
John D. Hines

Exhibit A

The Economic Contribution of Colstrip Steam Electric Station Units 1-4

FINAL REPORT

November 2010

Prepared by: Patrick M. Barkey, Ph.D.
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Prepared for: The Colstrip Steam Electric Station Owners

Acknowledgements

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Table of Contents

Executive Summary

This report describes an independent analysis of the economic contribution of the Colstrip electric generating facility operated by PPL Montana, and jointly owned by PPL Montana, LLC, NorthWestern Energy, LLC, Puget Sound Energy, Inc., Portland General Electric, Avista Corporation, and PacifiCorp. Puget Sound Energy, Inc. owns 50% each of Units 1 and 2 and 25% of Units 3 and 4, respectively. PPL Montana owns 50% each of Units 1 and 2 and 30% of Unit 3. Portland General Electric owns 20% each of Units 3 and 4. Avista Corporation owns 15% each of Units 3 and 4, and PacifiCorp owns 10% each of Units 3 and 4. NorthWestern Energy owns 30% of Unit 4. Since 1986 when the final generating unit came on-line, this coal-fired, zero discharge electricity generating station has provided power to Montana and the Northwest.

The research question posed in this study is: what would the economy of Montana look like if the Colstrip facility did not exist? Since the construction of the plant is long completed, the study is confined to an examination of the operation of the plant only.

The study was conducted by performing a comprehensive assessment of the direct contribution of the facility's operations on income, production and expenditure flows in the economy. As a mine-mouth plant, those operations are closely linked to production at the Western Energy Company's mine that is adjacent to the facility. Since energy production forms an important part of the state tax base in Montana, special emphasis is placed on the contribution of Colstrip operations to state and local tax revenues as well. This information was used to construct an economic scenario where Colstrip operations did not take place. The difference between the actual baseline and this hypothetical scenario represents the total contribution of Colstrip operations on the state economy.

The Economic Contribution of the Colstrip Steam Electric Station Units 1-4

Impacts Summary

Category	Units	Impact	
		Montana	Eastern MT
Total Employment	Thousands (Jobs)	3.7	3.5
Private Non-Farm Employment	Thousands (Jobs)	2.7	2.5
Gross Domestic Product	Millions of Dollars	638.5	621.1
Personal Income	Millions of Dollars	362.1	340.4
Disposable Personal Income	Millions of Dollars	322.9	303.4
Population	Thousands	7.8	7.3

The basic finding of this report is that the economy of Montana is larger, more prosperous and more populous because of the operations of Colstrip. Specifically, we find that because of Colstrip there exist

- 3,740 more jobs, including 2,688 private sector jobs,
- $360 million more in personal income received by Montanans,
- $638 million more net output produced across Montana, and
- 7,700 more people

than would be the case otherwise. These changes occur because of the new expenditure flows that come into the region and the state, at least part of which are received by Montana businesses and households as income, which are in turn spent again within the economy.

The statewide impact of Colstrip is significant – the impact on the economy of eastern Montana is even more sizable. In an environment where good paying jobs are hard to find, the workers at the generating plants and the Western Energy Company coal mine enjoy wages and benefits that are more than three times greater than the average for Eastern Montana. Colstrip operations ultimately produce an eastern Montana economy with more than 7 percent more jobs, more than 9 percent more income, and more than 17 percent higher production that would exist otherwise.

Energy taxes form a critical part of the tax base in the state of Montana, both for state and local governments. Without Colstrip, significantly less tax revenues would be available for schools, roads, parks, and public services of all kinds. Tax revenues are an important way in which the benefits of Colstrip propagate to every corner of the state.

The ultimate impact of Colstrip operations is to raise state and local tax collections by almost $104 million. The state of Montana's proportion of this total amounts to 4.5 percent of all state revenue collections. The bulk of this revenue flows into the general fund, which is used to fund the general operations of state government.

Local property and natural resource taxes paid to Rosebud County and the City of Colstrip help to keep their tax rates among the lowest in the state. But almost two-thirds of the $104 million in total taxes associated with Colstrip go to the State of Montana, and these benefit persons statewide. For example, about $12 million is collected in property taxes intended for school equalization. This amount has historically been distributed to all school districts across the state.

The fundamental conclusion of this study is that the contribution that has been made, and continues to be made, by the generating facility in Colstrip, Montana is larger than many Montanans may realize. The information in this study will hopefully be of use in policy and other decisions that steer Montana's economic future.

1. Introduction and Overview

This is a study of the contribution to the Montana economy of the operations of the Colstrip Steam Electric Station (SES) Units 1-4. Operated by PPL Montana, LLC, and jointly owned by PPL Montana, NorthWestern Energy, LLC, Puget Sound Energy, Inc., Portland General Electric, Avista Corporation, and PacifiCorp, the coal-fired electric generation facility located in Rosebud County, Montana, is the largest industrial facility in the state. The authors of this report were retained by the Colstrip owners to conduct an independent assessment of how the operations of the plant interact with the economy of the region and the state to grow the economic pie. This report presents the results of that assessment, together with a description of the methods and assumption used to derive the results.

This is an economic impact study of a facility which has already been built. The time span of the 1970's and the 1980's when Units 1 and 2, followed by Units 3 and 4, were built, was a period of strong economic activity and growth in Colstrip as well as Rosebud County. The impacts of plant construction, while significant, were also temporary. They are not included in any of the estimates presented in this report. The impacts we report represent the continued, ongoing contribution to the economy that is due to the operations of the plant. The basis for these estimates is the actual, historical experience of its operation over the last decade.

The purpose of this study is to achieve a better understanding of how the operations of the Colstrip generating facility affect the economic well-being of Montanans. As will be shown below, not only are the ultimate economic impacts of Colstrip's operation sizable in magnitude, but they also propagate throughout the entire state economy.

Background

The Montana Power Company (MPC) conceived the Colstrip complex in the late 1960s as a mine-mouth generation facility. In conjunction with Puget Sound Energy (PSE), construction of Colstrip units 1 and 2 were begun in the early 1970s and completed in 1975 and 1976. Each unit has a net generating capacity of about 307 megawatts. A transmission line was built from Colstrip to Broadview (north of Billings) and the electric power was fed into the MPC'S grid and to the Bonneville Power Administration for transfer to the PSE's service area.

After lengthy regulatory hearings, Colstrip units 3 and 4 were begun in the late 1970s. Unit 3 began operation in 1984 and unit 4 came on line in 1986. Each unit has a net generating capacity of 740 megawatts. Colstrip 3 and 4 were owned by MPC plus a number of other utilities in the Norwest. A transmission line was constructed from Colstrip across central and western Montana to connect the generating plants with the BPA distribution system and deliver the electricity to the service areas of the other utilities.

During the deregulation heyday of the 1990s and early 2000s, MPC sold its ownership interests in the Colstrip complex to PPL Montana. The associated coal mine was sold to Westmoreland Resources, but retained the Western Energy Company name. Northwestern Energy, the successor to MPC, purchased a 30 percent interest in Colstrip 4 in 2008.

Objectives of this Study

The objective of this study is to derive and present the economic contribution of the operations of Colstrip, to better inform decisions that impact its competitiveness and viability.

As the state's largest industrial facility by both output and employment, the footprint of Colstrip is large, both in the local and state economies. Its wages are significantly above the state average, and its contribution to state and local taxes is significant. The state taxes directly and indirectly paid by Colstrip mean that residents far from eastern Montana receive benefits. At the local level, the small city of Colstrip still has the third highest taxable property tax base among incorporated areas statewide. Presenting the difference the facility makes to the economy aids in understanding its value as part of our economic landscape.

The Research Question

The fundamental question asked by this study is, what would the economy of eastern Montana, as well as the state as a whole, look like if the Colstrip generating facility did not exist? This counter-factual scenario is not a shut-down of the actual facility. Rather the scenario considered is one where it never existed. To answer this question, we need to construct an economy where the employment, purchases, maintenance and capital spending, and taxes paid by the plant are removed. This is accomplished with the aid of a dynamic economic model, the REMI model. (The REMI model is more fully explained in Chapter 2).

In a no-Colstrip scenario, the generation of electric power and all of the activities associated with that activity do not take place. Thus the employment of regular and contract employees, both full time and temporary, the purchases of the full spectrum of intermediate goods and services, the purchases of coal from the Western Energy mine, spending on plant overhauls and maintenance, capital spending, as well as tax payments, are no longer present. We refer to this as the direct impact of Colstrip.

There are additional activities which, while not directly part of the process of producing electricity, are fundamentally linked to that process. By far the most significant of these is the operations of the Western Energy Company's (WECo) coal mine which serves the plant. Approximately 89 percent of the output of the WECo mine goes to Colstrip. In a no-Colstrip scenario, this mine is sharply reduced in scale. The mine is part of what we refer to as the indirect impact of Colstrip.

The direct and indirect impacts of Colstrip propagate and reverberate throughout the local and state economies. Compensation to employees is spent, in part, in the community on goods and services which employ others. Spending on vendors impacts the economy as well, to varying degrees. These induced impacts are estimated with the use of the REMI model, as described in the next Chapter. The economic impact of Colstrip is the sum of direct, indirect, and induced impacts.

In this study we have made no effort to represent how the loss of the generating capacity located within Montana would impact price levels and price stability for electric power for the state's residential, commercial and industrial customers. This essentially amounts to the assumption that the loss of Colstrip has no impact on prices or reliability of power. This is not a realistic assumption, yet our limited access to the tools to allow us to credibly analyze and incorporate the impacts produced by markets for electric power left us with no other alternative. The assumption of no disruption or change to electric prices tends to make actual impacts of Colstrip larger than those presented in this study.

The Eastern Montana Economy

The contribution of the Colstrip generating facility to the economy of the region and the state needs to be understood in the context of the performance and characteristics of the economy as it exists today. The eastern Montana (see the next chapter for a precise definition) economy is characterized by a large land area with a small population. As shown in table 1.1, the total population is approximately 74,300 persons. There are about 49,000 jobs in the area, including proprietors and the self-employed. The driving economic activities are agriculture, oil and gas exploration and extraction, and coal mining.

The dominant economic development issue in eastern Montana, as in many rural areas in the west, is the lack of good paying jobs. Table 1.1 presents four measures of well-being and average job quality that can be used to evaluate the Colstrip jobs. Per capita income is total income (wages, dividends, retirement, etc) divided by total population. Average annual wages are the amounts received by people who work for wages. Average annual compensation includes wages plus employer paid benefits. Earnings are compensation plus the earnings of the self-employed (which includes many farmers and ranchers).

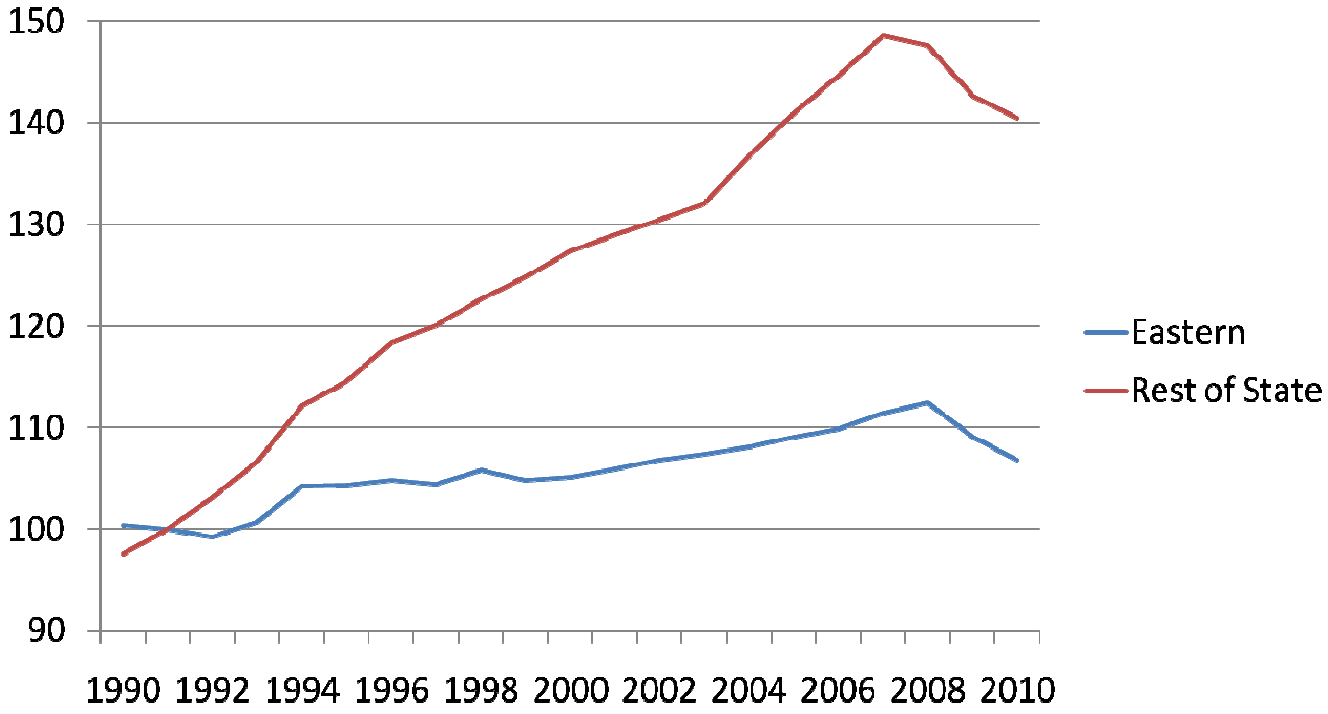
Table 1.1

The Eastern Montana Economy

Category	Eastern Montana	Rest of State
Population (persons)	74,300	896,400
Employment (persons)	49,000	564,000
Per Capita Income	$30,800	$33,100
Average Annual Wages	$23,400	$25,100
Average Annual Compensation	$28,600	$30,500
Average Annual Earnings	$33,500	$36,700

This study will demonstrate the significant impact the operations at Colstrip have on both employment levels and on average wages in eastern Montana. As can be seen from the table, compensation levels today are lower in eastern Montana than in the rest of the state. Without Colstrip, these differences would be even larger, as we will demonstrate.

Figure 1.1
Employment as a Percent of 1991 Employment,
Eastern Montana and the Rest of the State, 1990-2010



Relative to the remainder of the state, economic growth has been slower in eastern Montana. Over the last two decades, employment growth has been significantly faster in the rest of the state, as shown in Figure 1.1. Even though employment in both parts of the state has declined due to the recession, there are 40 percent more jobs in the remainder of the state today than there were in 1991. The comparable figure for eastern Montana is only 8 percent.

Organization of this Report

The remainder of this report details the methodology and the results of this study. Since the characteristics of an economy without Colstrip cannot be observed directly, they must be estimated with the use of an economic model. In the next section we describe the nature and the capabilities of the model leased for this study from Regional Economic Models, Inc. We then detail the direct contributions of Colstrip operations and the closely linked Western Energy Company mine to the economy in terms of income, production, jobs and other economic variables. The findings of the study are reported in full detail in Chapter 5. This is followed by a chapter with full detail on the tax impacts of Colstrip operation. Chapter 7 ends the report with a summary and conclusions.

2. Policy Analysis with the REMI Model

Economic impacts occur because of events or activities that create new expenditures. Spending which is new – which is over and above existing expenditures and does not simply displace spending elsewhere in the region – not only adds to economic activity in its own right, but it also induces further spending as the recipients of wages, sales and tax revenues spend a portion of their income in the local economy. Changes in the path of investment, migration, and prices and wages are possible as well.

The basic tool used in this study to assess the economic contribution of Colstrip is an economic model, calibrated to represent the interactions in the Montana economy, leased from Regional Economic Models, Inc.. The REMI model is one of the best known and most respected analytical tools in the policy analysis arena, and has been used in more than a hundred previous studies as well as dozens of peer-reviewed articles in scholarly journals. It is a state-of-the-art econometric forecasting model that incorporates dynamic feedbacks between economic and demographic variables. The REMI model forecasts employment, income, expenditures and populations for counties and regions based on a model containing over 100 statistically estimated behavioral and dynamic relationships as well as a number of identities. A full explanation of the design and operation of the model can be found in Treyz (1988).

The model used in this study disaggregated the state economy into five regions: Northwest, Southwest, North Central, South Central, and Eastern. It explicitly recognizes trade flows that exist between these regions, as well as between the regions and the rest of the world. The definition of the regions is shown in Figure 2.1 below.

Figure 2.1
Economic Regions

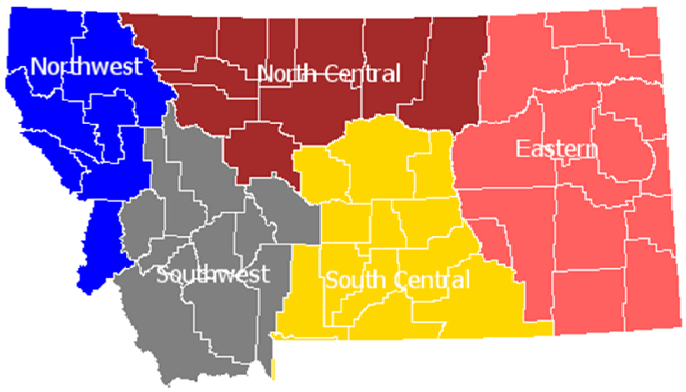
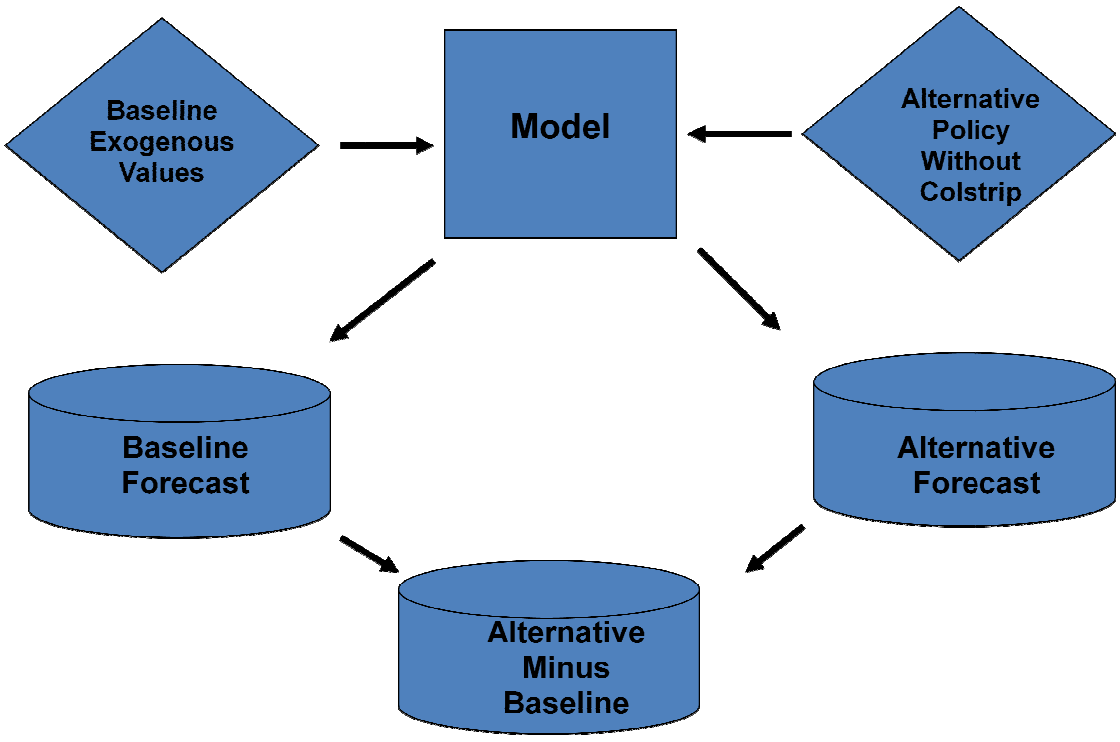


Table 2.1
Eastern Montana Counties

Carter	Powder River
Custer	Prairie
Daniels	Richland
Dawson	Roosevelt
Fallon	Rosebud
Garfield	Sheridan
McCone	Valley
Phillips	Wibaux

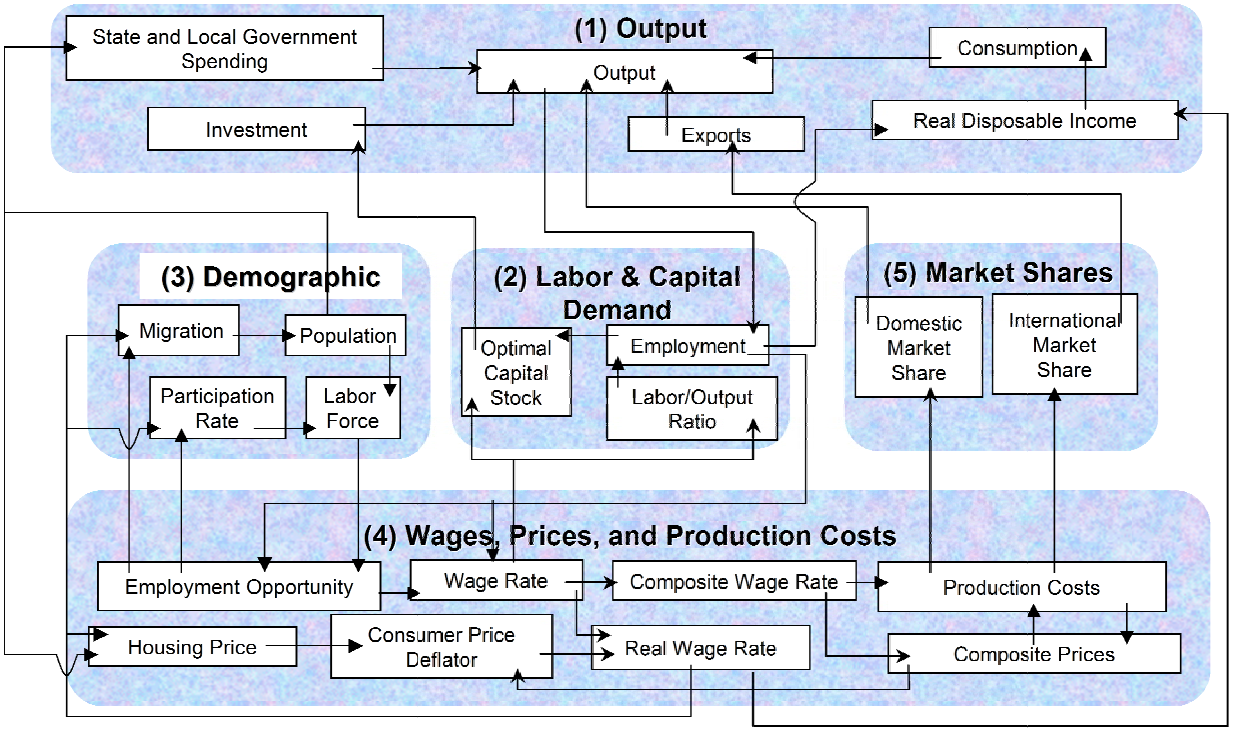
Figure 2.2
Policy Analysis With the REMI Model



The use of the model to derive the results of this study is illustrated graphically in Figure 2.2. First, a baseline projection of the economy is produced using the model, utilizing inputs and assumptions which extrapolate growth and conditions of recent history. The model is then used a second time, with identical inputs – except that in this alternative scenario, the activity of

Colstrip is removed. Thus the activity of Colstrip is an input that ultimately produces a different economy, reflecting not only the removal of the production, employment, and expenditures of the plant, but how the rest of the economy reacts to those changes. The difference between the baseline and alternative scenarios of the economy represents the economic impact of Colstrip.

REMI Model Linkages (Excluding Economic Geography Linkages)



The model utilizes historical data on production, prices, trade flows, migration and technological change to calibrate the relationship between five basic blocks of the regional economy as depicted above: output, labor and capital demand, population and labor force, wages and prices and market shares. The changes in production, labor demand and intermediate demand caused by the hypothetical cessation of Colstrip operation causes these blocks of the economy to react and adjust to a new equilibrium. As described above, the difference between the baseline and the alternate scenario is the ultimate impact of Colstrip.

The essential philosophy of the model is that regions throughout the country compete for investment, jobs, and people. When events occur in a region, they set off a chain reaction of actions where dollars flow towards better investment and production opportunities, followed over time by a flow of workers and households towards employment opportunities and higher wages. The model embodies an 82-sector input-output matrix that describes the technological interdependence of production sectors of the economy, as well as extensive trade and capital flow data to determine the share of each sector's demand that can be met by local production.

The model is extremely well suited for the analysis described in this report. As seen in several of the energy studies listed in the references section, it has been used for similar analyses of energy-related investment and opportunities.

As powerful and flexible as the model is, the answers it provides are only as good as the questions posed to it. The majority of work in this study is carefully crafting the inputs used to construct a scenario of the Montana economy that does not include Colstrip operations. We now turn to this task.

3. The Direct Economic Contribution of Colstrip

The analysis begins with a comprehensive examination of the expenditures and income flows that stem from the operation of the Colstrip generating facility itself. In order to produce an economic scenario where those operations are assumed to be absent, we must carefully and completely quantify the footprint of the facility's ongoing activity.

The source for much of this information comes from PPL Montana, LLC, the operator of the plant. Using historical records we constructed a "typical" annual expenditure profile of the facility. This profile is one in which no unusual, unplanned shutdowns or outages take place, and in all other respects the operating levels are "normal."

Normal in this context does not mean that the units are in operation for the entire year. In the normal course of events, scheduled shutdowns for maintenance and refurbishment occur on the individual units of the plant in each year, which take them off line for approximately 6 weeks. During these times, approximately 550 contractor employees are working at the facility on unit overhauls and other work. There are also contractor employees at the site during ordinary plant operation times, both in overhaul and operations.

The separate mechanisms through which Colstrip operations add to the income and expenditure flows in the Montana economy are as follows:

Employment

- The number of employees of PPL Montana who work at the Colstrip facility in a typical year is 393. These include 287 union, 83 non-union, and 23 part-time employees.

- There are approximately 45 year-round contractors at the site working on overhaul projects, as well as 55 additional contractors working year-round on aspects of plant operations.

- With four generating units and a three year cycle of scheduled overhauls, there are 1.3 units of Colstrip's facility shut down for maintenance in any given year. With 550 contractors working on overhaul during these periods, this yields a full-time equivalent of an additional 84.6 employees who are contractors working at the facility.

- Thus we estimate year-round facility employment to be just over 577 workers, including both PPL Montana and contract employment.

Compensation

- Total labor costs paid by PPL Montana for a typical year are $43.1 million, which includes wages and benefits. Benefits include health insurance, life insurance and pension contributions. This is an average compensation per worker in excess of $100,000.

- Actual compensation per worker for contractor employees was not made available for this study. Industry averages were instead used.

Coal Purchases

- Intermediate demand of the Colstrip facility is dominated by fuel purchases, largely coal. All coal for the plant comes from the adjacent WECo mine, delivered to the facility via trucks and conveyors.

- In a typical year the generating units consume $146.5 million in coal from the WECo mine. This figure is an average of actual purchases over the last four years. This is approximately 10.1 million tons of coal per year.

Other Intermediate Demand

- The Colstrip facility purchases $35 million in other goods and materials each year. These purchases create an intermediate demand for 82 individual industries, some with a presence in Montana.

- PPL Montana also spends an additional $91.6 million in contracts with vendors, including overhaul costs. Roughly a third of this spending reflects operations and maintenance, and the remainder is for capital costs that take place in a typical year.

Output

- In a typical year the four units of Colstrip produce about 17,000 GWH of electricity.

State and Local Taxes

- The facility and its employees pay $39.1 million in state and local taxes in a typical year.

- More detail on taxes is presented in Chapter 6.

Each of these mechanisms was carefully crafted and implemented as a change to the economy in the appropriate block of the REMI model as described in the previous section. But the operation of the generating facility fundamentally depends on the operation of the adjacent Western Energy Coal mine that supplies its coal needs. Thus we must consider the operation of the mine as well, as described in the next section.

4. The Western Energy Coal Mine

The Colstrip facility was conceived and developed as a mine-mouth generation plant. Its coal needs are currently served by the adjacent coal mine operated by Western Energy Company (WECo) and Colstrip and the mine are closely linked. Thus an analysis of the contribution of Colstrip must proceed in tandem with the contributions of the mine which are part of its operation.

Approximately 89 percent of WECo coal is delivered to Colstrip, via conveyor and specially designed trucks. The cost of coal to Colstrip represents both the cost of the coal and the cost of delivery. In the no-Colstrip scenario constructed as part of this impact study, 89 percent of WECo operation, including the transportation of the coal, would also cease to exist.

In total, the WECo mine represents:

- 373 employees
- $39 million in annual compensation
- $74 million in intermediate demand for goods and services

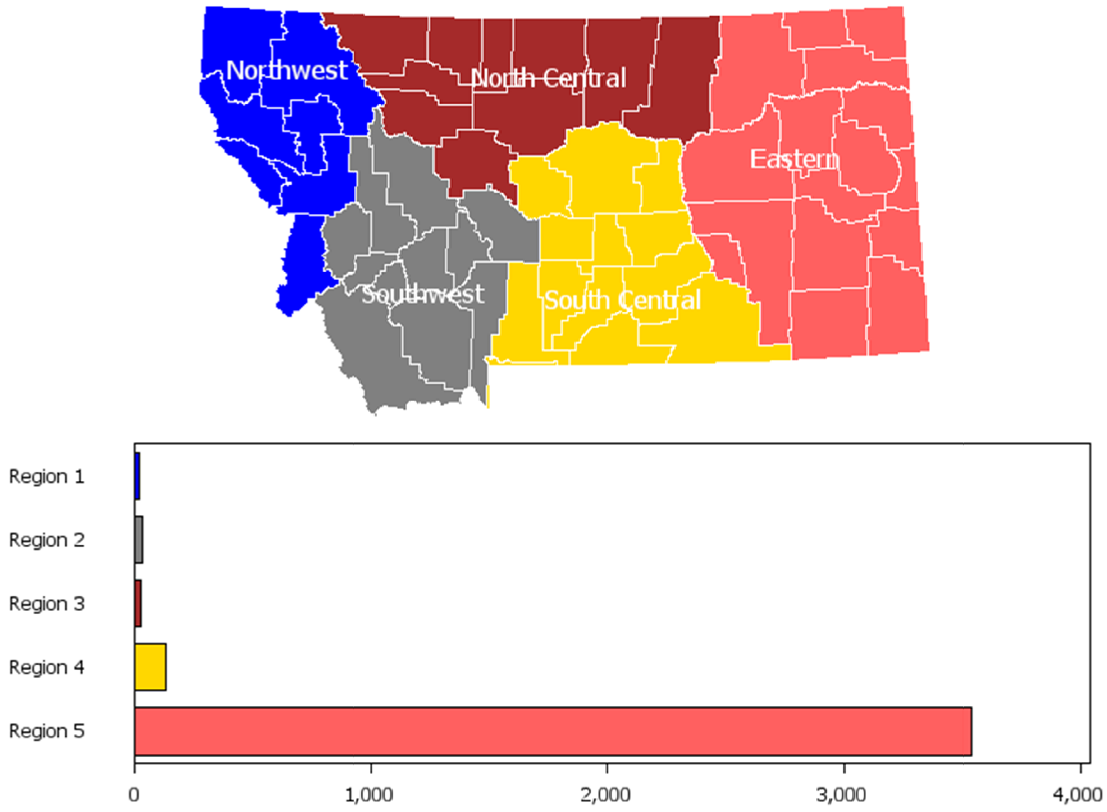
As was the case with the Colstrip facility itself, the intermediate demand is spread across 82 industries representing the production of goods and services both from within Montana and elsewhere. Removing the portion of the mine's output that serves Colstrip removes that spending, as well as the payroll and tax contributions of the mine.

This information on the Colstrip operation in the previous chapter and the WECo mine's activity as described above comprise what we have referred to as the direct and indirect impacts of Colstrip, respectively. The total impact of the facility is derived by generating an alternative projection of the state and regional economies with our economic model, taking into account the direct and indirect impacts described above. We now turn to the results of that analysis.

5. Economic Impacts

The operations of the Colstrip Steam Electric Station, together with the operations of the WECo mine which directly serves its operation, ultimately produce a state economy that is significantly larger, more populous, and more prosperous than would exist in its absence. A comparison of income, employment, and investment between the baseline and an economic scenario with no Colstrip reveals the size of its ultimate contribution to the economy.

Figure 5.1
The Economic Contribution of the Colstrip Steam Electric Station Units 1-4
Employment Impacts by Region

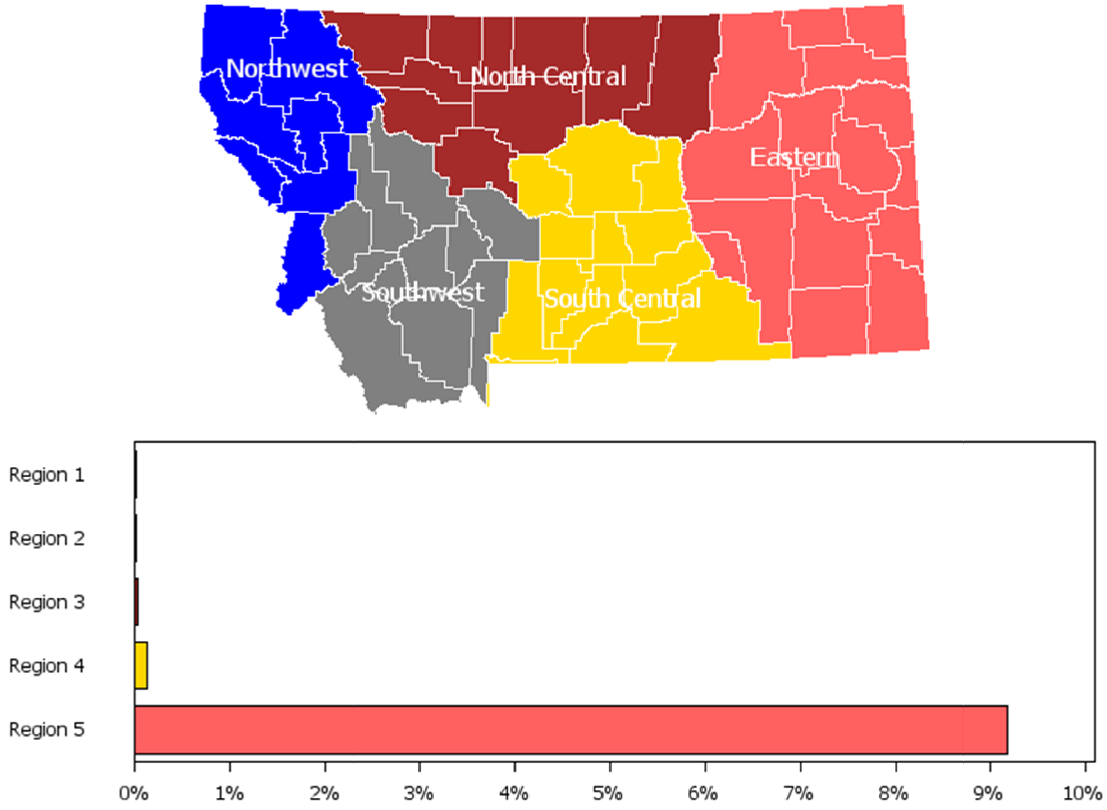


Most, by no means all, of the economic impacts of Colstrip are in the eastern Montana region which contains Rosebud County. The employment impacts of the generating facility are positive in all five regions of the state, as shown in Figure 5.1 above. The south central region, which contains Billings, does see some significant increase in employment as a result of Colstrip operation, which is due to the significant trade flows that exist between the regions. But the most of the employment impacts are clearly in the eastern Montana region.

Given the smaller size of the eastern Montana economy compared to the other four regions, this contrast is even more apparent when examined in percentage terms. In Figure 5.2 we present the impacts of Colstrip for the five regions on personal income as a percent of the baseline projection. Because of Colstrip, eastern Montana personal income – total income received by

person – is more than 9 percent higher than it would have been in the absence of the facility. As can be seen, the relative impact of Colstrip on personal income in the other regions is positive, but much smaller than in the east.

Figure 5.2
The Economic Contribution of the Colstrip Steam Electric Station Units 1-4
Personal Income Impacts by Region, as Percent of Baseline



Thus in presenting the other findings of the analysis of this study, we will focus on two geographic areas: eastern Montana, and the state of Montana as a whole.

A summary of the aggregate impacts of Colstrip operation on the state and regional economy, presented in Table 5.1, reveals the extent of the facilities contribution to economic well-being. The generation of electrical power at the site is ultimately responsible for more than 3,700 jobs statewide – significantly more than the average of 393 employed by PPL Montana and the 373 workers at the WECo mine. The impacts reported in Table 5.1 and throughout this section include those induced elsewhere in the economy as a result of the facility's operation.

Of the total jobs impact, almost 2,700 jobs are private sector payroll jobs. The other jobs are in government, mostly local government workers in public schools. Those jobs are a direct response to the additional 7,776 people whose presence in Montana is due to Colstrip operation.

Table 5.1
The Economic Contribution of the Colstrip Steam Electric Station Units 1-4
Impacts Summary

Category	Units	Impact	
		Montana	Eastern MT
Total Employment	Thousands (Jobs)	3.7	3.5
Private Non-Farm Employment	Thousands (Jobs)	2.688	2.508
Gross Domestic Product	Millions of Dollars	638.5	621.1
Personal Income	Millions of Dollars	362.1	340.4
Disposable Personal Income	Millions of Dollars	322.9	303.4
Population	Thousands	7.8	7.3

There is more than $600 million of additional output produced by the Montana economy as a result of Colstrip. This represents about 1.1 percent of total output in the entire state, attributable to the operations of a facility in Rosebud County. The $621 million of total economic output due to Colstrip in eastern Montana is more than 17 percent of the output of the entire region.

Much of the benefits from Colstrip go to individual Montanans as income. Personal income is $362.1 million higher in Montana as a result of Colstrip. As a state which relies heavily on the personal income tax, that represents a sizable contribution to the state's treasury, as we detail further in the next chapter. Almost $323 million of that income is available to persons in after-tax income for saving and spending.

As shown in Table 5.2, the employment impacts of Colstrip are spread across many industries. Not surprisingly, the largest private-sector impact is in the utilities industry, due to the direct contribution of the facility itself. But there are significant job impacts in other industries due to the induced demand of Colstrip and WECo employees as well as vendors and businesses who receive revenue from Colstrip. Retail trade employment is almost 400 jobs higher. Health care employment, impacted by both population and the relative affluence of Colstrip workers, is 372 jobs higher than it would be without Colstrip.

Employment in state and local government is significantly affected by Colstrip operation. Both receive significant tax revenue, both directly from the facility as well as from other activities induced by its operation, as more fully detailed in the Chapter 6. But Colstrip operation also impacts the demand for government services as well. This is because workers and households have moved to Montana from elsewhere because of the economic opportunities created by

Colstrip. This increases the population of school-aged children and increases demand for K-12 schools, as well as other demands for government services.

Table 5.2
Employment Impacts Summary

Industry	Impact (jobs)	
	Montana	Eastern MT
Forestry, Fishing, Related Activities, and Other	-2	-2
Mining	323	320
Utilities	572	571
Construction	252	232
Manufacturing	-3	-5
Wholesale Trade	19	15
Retail Trade	397	369
Transportation and Warehousing	2	-1
Information	4	3
Finance and Insurance	15	13
Real Estate and Rental and Leasing	22	12
Professional and Technical Services	114	100
Management of Companies and Enterprises	1	1
Administrative and Waste Services	68	57
Educational Services	8	4
Health Care and Social Assistance	372	342
Arts, Entertainment, and Recreation	78	68
Accommodation and Food Services	246	227
Other Services, except Public Administration	201	184
State Government	128	122
Local Government	924	911
TOTAL	3,740	3,541

The employment impacts can also be examined from a different perspective, namely, how Colstrip creates jobs for those in different occupations. As can be seen in Table 5.3, almost one in four new jobs due to Colstrip operations are in the sales, office and administrative occupational category, which includes teachers. Colstrip-induced jobs can also be found across a very broad spectrum of skills and occupations. A significant proportion of these jobs are in construction and extraction, maintenance and repair, as well as production and material moving

workers. There are also more than 300 management jobs in the Montana economy that are due to Colstrip operation.

Table 5.3
Impacts on Employment by Occupation

Category	Impact (jobs)	
	Montana	Eastern MT
Management, business, financial occupations	309	294
Computer, math, architect, engineer occupations	163	156
Life, physical, social science occupations	42	40
Community, social service occupations	106	101
Legal occupations	37	36
Education, training, library occupations	57	52
Arts, design, entertainment, sports, media occupations	26	24
Healthcare occupations	249	232
Protective service occupations	271	264
Food preparation, serving related occupations	289	267
Building, grounds, personal care, service occupations	251	232
Sales, office, administrative occupations	820	769
Farm, fishing, forestry occupations	4	4
Construction, extraction occupations	388	372
Installation, maintenance, repair occupations	337	325
Production occupations	181	175
Transportation, material moving occupations	210	198
Total	3,740	3,541

Table 5.4
Impacts on Disposition of Personal Income

Category	Impact ($ mill.)	
	Montana	Eastern MT
Total Earnings by Place of Work	331.1	319.7
Total Wage and Salary Disbursements	220.0	211.0
Supplements to Wages and Salaries	72.8	70.3
Employer contributions for employee pension and insurance funds	48.9	47.4
Employer contributions for government social insurance	23.9	23.4
Proprietors' income with inventory valuation and capital consumption adjustments	38.3	37.8
Less: Contributions for government social insurance	44.6	43.2
Employee and self-employed contributions for government social insurance	20.7	19.7
Employer contributions for government social insurance	23.9	23.4
Plus: Adjustment for residence	-5.3	-11.7
Gross In	6.4	0.0
Gross Out	11.7	11.7
Equals: Net earnings by place of residence	281.2	264.8
Plus: Rental, Personal interest, and Personal dividend income	40.4	36.8
Plus: Personal current transfer receipts	40.4	38.4
Equals: Personal Income	361.9	340.5
Less: Personal current taxes	39.3	36.8
Equals: Disposable personal income	323.1	303.2

Additional workers in the state economy translate into higher earnings and more tax collections. But it is important to note that wage income is only one part of the overall increase in income received by Montanans because of the operations of Colstrip. As shown in Table 5.4, about $220 million of the total increase of almost $362 million in personal income due to Colstrip is accounted for by higher wage and salary disbursements to payroll employees. Accounting for the difference are supplements to wages, including contributions by employers to employee pensions, income of business proprietors and the self-employed, rent and property income, and

income transfers from the federal government. The personal tax impacts noted in Table 5.4 include federal as well as state and local taxes. We focus on state and local tax impacts in more detail in the next section.

Table 5.5
Impacts on Private Sector Compensation and Earnings

Category	Units	Impacts	
		Montana	Eastern MT
Wage and Salary Disbursements	$ Millions	163.7	156.1
Compensation	$ Millions	212.6	203.6
Earnings by Place of Work	$ Millions	251.4	241.9
Average Annual Wage Rate	$ Thousands	0.116	1.818
Average Annual Compensation Rate	$ Thousands	0.164	2.562
Average Annual Earnings Rate	$ Thousands	0.203	3.213

One of the factors helping to account for the very significant additional economic impact induced by the wages and expenditures of the Colstrip facility is the fact that the jobs at both Colstrip and the WECo mine pay wages significantly in excess of the state and regional average. This represents more dollars available to be spent in the local communities, helping to increase second round employment effects.

Thus the impact of Colstrip is not to simply add jobs and to add income, but to actually raise the average pay for all jobs in the economy. As shown in Table 5.5, the average annual wage of all workers in the private sector of the state economy is $116 higher per worker as a result of Colstrip. The average annual earnings, which include both benefits as well as proprietors' income, is increased by $203 for all state workers in the private sector. In eastern Montana, the impacts are much more pronounced – Colstrip raises average annual earnings in the region by more than $3,200 per worker.

The operation of Colstrip adds significantly to economic output as well. This occurs through three basic mechanisms. First, the facility itself produces electricity. Secondly, as part of the production process, the plant induces output from other firms in Montana – most notably the coal from the WECo mine, but also services and materials from everything from legal firms to maintenance and overhaul services. Finally there are the output increases across the economy to satisfy the locally produced component of demand induced by second round spending.

The gross output increases in the economy that are attributable to Colstrip, as shown in Table 5.5, are highest in the utility industry itself, followed by the mining industry There are also significant output impacts in retail trade, health care and construction. As with most impacts, these are largest in the eastern Montana region.

The negligible impact of Colstrip on manufacturing output in the state economy is largely an artifact of the structure of this study. As discussed in the introduction, this study does not explicitly consider the impact of the loss of Colstrip operation on electricity markets in Montana. Were those impacts to be considered, they would likely show a positive impact most markedly on manufacturing, since the presumably lower and more stable electricity prices in a with-Colstrip economy would lower production costs for energy-intensive industrial applications.

Table 5.6

Impacts on Output by Major Industry

Category	Impact ($ mill.)	
	Montana	Eastern MT
Forestry, Fishing, Related Activities, and Other	0.0	0.0
Mining	138.2	137.0
Utilities	537.6	537.6
Construction	24.3	21.8
Manufacturing	0.0	-1.3
Wholesale Trade	7.7	6.4
Retail Trade	55.0	49.9
Transportation and Warehousing	1.3	1.3
Information	2.6	1.3
Finance and Insurance	5.1	3.8
Real Estate and Rental and Leasing	3.8	2.6
Professional and Technical Services	7.7	6.4
Management of Companies and Enterprises	0.0	0.0
Administrative and Waste Services	3.8	2.6
Educational Services	0.0	0.0
Health Care and Social Assistance	30.7	28.2
Arts, Entertainment, and Recreation	5.1	5.1
Accommodation and Food Services	7.7	7.7
Other Services, except Public Administration	6.4	6.4

The impact of Colstrip on Montana output and employment is dependent on the composition of the state economy. The increases in demand for goods such as clothing or motor vehicles that may come about due to Colstrip operation will not significantly increase the manufacturing of those items in Montana simply because there is very little, if any, presence of those industries in the state to begin with. However, increased demand for manufactured goods produced elsewhere still has an impact on the state's retail, wholesale, and transportation industries.

As shown in Table 5.7, Colstrip operations do produce higher demands among Montana consumers for a wide spectrum of goods and services. Consumers in eastern Montana spend $26.2 million on motor vehicles and parts, $37.5 million on food and beverages, and $56.2 million on medical care in the region because of Colstrip. To put it another way, auto dealers and repair shops, restaurants and grocery stores, and hospitals and clinics in the eastern part of the state would have their business collectively reduced by these amounts if Colstrip did not exist.

Table 5.7

Impacts on Personal Consumption Expenditures

Category	Impacts ($ mill.)	
	Montana	Eastern MT
Vehicles & Parts	27.2	26.2
Computers & Furniture	82.9	78.7
Other Durables	13.6	13.7
Food & Beverages	40.8	37.5
Clothing & Shoes	13.6	13.7
Gasoline & Oil	6.2	6.2
Fuel Oil & Coal	0.0	0.0
Other Non-Durables	23.5	22.5
Housing	54.4	51.2
Household Operation	13.6	12.5
Transportation	12.4	11.2
Medical Care	59.4	56.2
Other Services	74.2	71.2

The mobility of people, jobs, and investment in response to changing opportunities is a fundamental process that drives economic growth. The presence of Colstrip in the Montana economy has drawn people as well as resources to Rosebud County and, to a lesser degree, the state of Montana as a whole. Workers who move in response to job opportunities – who would not have moved but for the operations of Colstrip – bring their current or future children with them, fundamentally altering the demographic profile of the population.

A comparison of the age distribution of the population with and without the presence of Colstrip reveals significant increases in those in the prime working age groups aged 20-55 years, as well as in the younger cohorts made up of their children. As shown in Table 5.8, the impact of Colstrip operation among 5-year age cohorts of the population is highest among those aged 40-44, with the presence of 800 people in that age category living in the state of Montana because of Colstrip. Roughly half of the 7,776 increase in population statewide due to Colstrip operations are in prime working ages between 20 and 55 years of age. In eastern Montana, the presence of almost 2,000 school-aged children between 5 and 19 years of age is attributable to the Colstrip generating facility.

Table 5.8

Impacts on Population by Age

Category	Impact (people)	
	Montana	Eastern MT
Ages 0-4	579	544
Ages 5-9	657	616
Ages 10-14	726	681
Ages 15-19	685	641
Ages 20-24	504	470
Ages 25-29	430	400
Ages 30-34	451	420
Ages 35-39	612	569
Ages 40-44	800	746
Ages 45-49	670	625
Ages 50-54	498	465
Ages 55-59	386	360
Ages 60-64	306	286
Ages 65-69	210	196
Ages 70-74	137	128
Ages 75-79	85	79
Ages 80-84	38	35
Ages 85+	2	2
Total	7,776	7,263

Thus the state, and particularly the eastern region of the state, is significantly younger, with a higher fraction of productive, working-aged people and their children with the presences of Colstrip in its economy than it would be without.

Conclusion

It is difficult to overstate the economic contribution of the Colstrip generating facility's operations to eastern Montana. More than 7 percent of all jobs, 17 percent of all production, 9 percent of all income, and 13 percent of school-aged population are in the region because of the operations of the plant. The spending by Colstrip employees as well as those at the WECo mine is only part of the stimulus to the region represented by the plant. The subsequent activity as the as Colstrip dollars are re-spent is substantial as well. These results highlight how large and diverse those economic contributions are.

Even when measured against the much larger economy of the entire state, the contributions of Colstrip are substantial. Businesses and consumers do benefit from Colstrip statewide through the trade flows that connect the state's regions, particularly to Billings. The higher than average wages of the Colstrip and WECo jobs produce a measurable impact on average compensation of all jobs statewide.

There is an additional way in which Colstrip-induced changes in the economy propagate throughout the state. That is the tax system. We now turn to a discussion of how Colstrip activities ultimately increase state and local tax revenues, many of which are spend throughout the state.

6. Tax Impacts

This section identifies and quantifies the amounts of nonfuel tax payments to state and local governments directly and indirectly associated with Colstrip. The amounts presented in the following tables represent taxes paid during a "typical" year. This procedure corrects for significant year to year changes in tax payments due to variations in electricity production (perhaps caused by planned maintenance), the overall profitability of the parent companies, national business cycle impacts, and other factors.

Whenever possible the tax payments were estimated from administrative records or other reliable sources. But Montana has a complex system for determining and collecting taxes and then distributing the proceeds to various governments. It is not always possible to determine the amount of taxes paid to various jurisdictions simply by looking at tax bills. Therefore, a variety of indirect methods and other procedures were used to estimate tax payments. For example, property taxes and certain natural resource taxes were calculated by first deriving the taxable value for each category and then applying the relevant mill rates imposed by the jurisdictions. Similarly, individual income taxes were derived by applying an average tax rate to the total income earned.

Payments were estimated for each tax and then aggregated into four categories:

1. *Individual and corporate income taxes*

   These taxes are paid by individuals and the companies that own Colstrip SES or provide the coal. The proceeds go to the state government and are deposited in the General Fund.

2. *Natural resource taxes*

   Three of the Montana's twelve natural resource taxes are relevant for Colstrip. The Coal Severance Tax is applied to the value of the coal and the proceeds go to state government. The Coal Gross Proceeds Tax is five percent of the gross proceeds of coal and is distributed to local taxing jurisdictions. The Resource Indemnity and Groundwater Assessment Tax is applied to the gross value of coal extracted and is allocated to state government accounts to fund remediation. Although not levied by the state, Montana receives about 48 percent of the revenue collected from U.S. Mineral Royalties and the proceeds are split between state and county governments.

3. *Property Taxes*

   The proceeds from property taxes go to the state, counties, school districts, cities and towns, and other jurisdictions. The property tax bills are sent out by the counties. Assets (such as homes, buildings, and electrical generation equipment) are assessed by the state and the relevant mill levies applied for the jurisdiction where the assets are located.

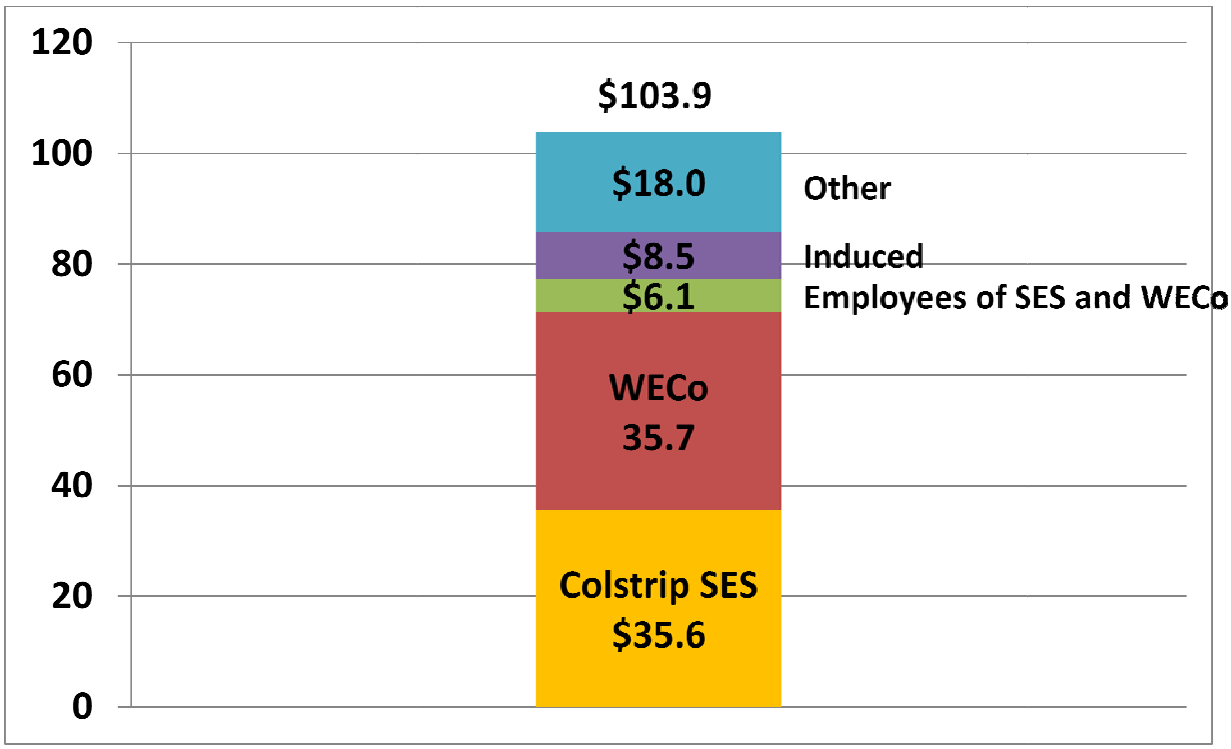
4. *Other Taxes*

There are 26 other taxes levied in Montana ranging from the Beer Tax to the Rail Car Tax. Seventeen were judged to be directly or indirectly tied to Colstrip and each was estimated separately. Two of the most important are the Electric Energy Producer's License Tax and the Wholesale Energy Transaction Tax, which are levied against the electric energy produced and transported in Montana. There is also a separate tax category which includes mostly other state and local intergovernmental revenue directly or indirectly associated with Colstrip, its workers, and others.

Tax Impacts by Taxpayer

As shown in Figure 6.1, the total state and local tax impact of Colstrip operations is substantial. Totaling the taxes paid by the facility itself, the WECo mine, the employees of both WECo and Colstrip, as well as payments associated with the induced economic impacts, they amount to $103.9 million. The Colstrip generating plant itself accounts for about $35.6 million, or roughly 34 percent of the total. The Western Energy Company coal mine paid approximately $35.7 million. The employees of the two companies paid about $6.1 million, or roughly 6 percent of the total. The induced economic activity accounted to $8.5 million in estimated tax payments, and about $18.0 million came from other sources.

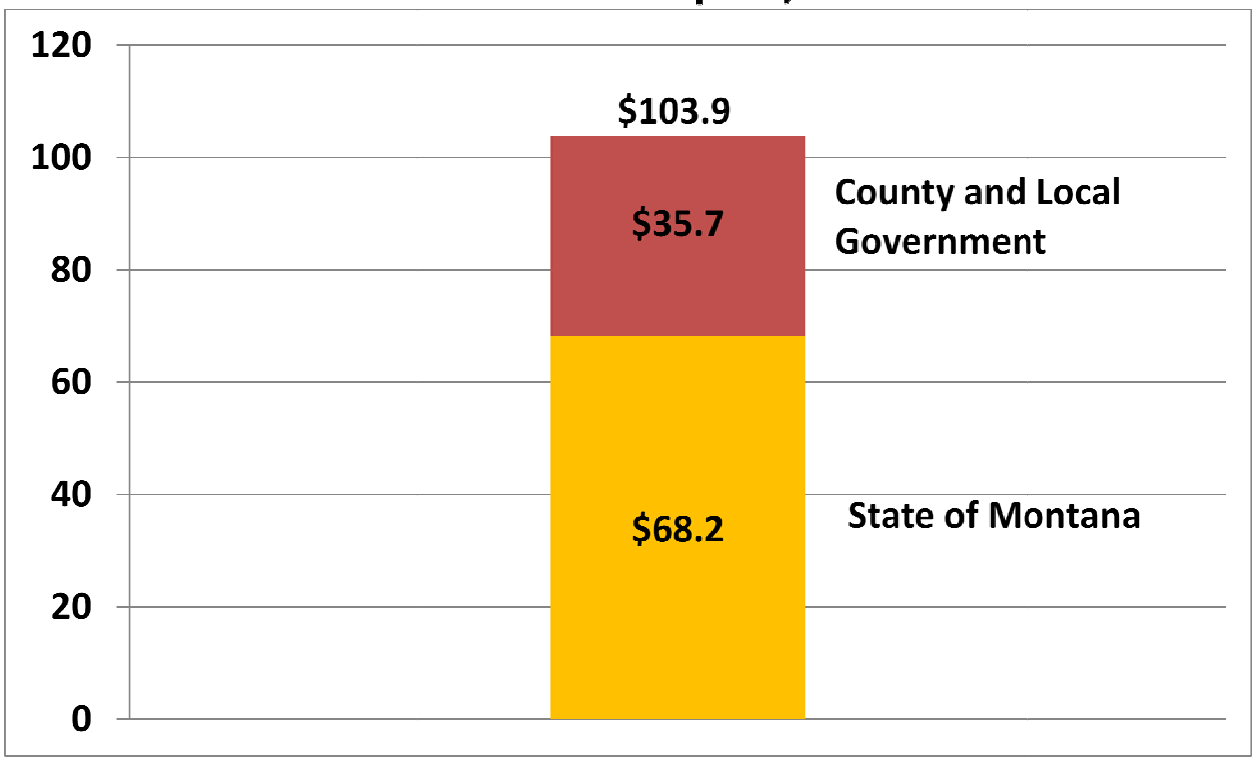
Figure 6.1
State and Local Tax Impacts by Taxpayer, Millions of Dollars



State and Local Tax Impacts

The $103.9 million in non-federal tax payments attributable to Colstrip operations flow to both state and local governments, as shown in Figure 6.2. The State of Montana received approximately $68.3 million, or 65.7 percent. Counties, cities, school districts, and special taxing districts (such as SIDs) received roughly $35.7 million, or approximately 34.3 percent.

Figure 6.2
State and Local Tax Impacts, Millions of Dollars



The distribution of taxes shown in Figure 6.2 may not represent the final incidence of the funds. For example, included in the $68.3 million paid to state government is roughly $11 to $13 million intended for school equalization. Legislation calls for a statewide property tax with the proceeds to be deposited in the state's General Fund. The Legislature is supposed to appropriate an amount to be distributed to all the state's school districts to support basic education. Since the actual amounts depend on legislative decisions, they cannot be reliably estimated.

State and Local Tax Impacts by Category and Taxpayer

The various taxpayers pay different taxes, as shown in Table 6.1. Of the $35.6 million paid by Colstrip, about $26.3 million or roughly 73.9 percent were in property taxes. The remaining taxes include the Montana Corporate License Tax paid by the owners and the Electric Energy Production Tax and the Wholesale Energy Transaction Tax.

Table 6.1
State and Local Tax Impacts, by Taxpayer
Millions of Dollars

			SES & WECo			
	Colstrip	WECo	Employees	Induced	Other	Total
Natural Resource Taxes	-	34.9	-	-	-	34.9
Property Taxes	26.3	0.6	1.9	4.1	-	32.9
Income Taxes	3.4	0.2	3.3	3.1	-	10.0
All Other Taxes	5.9	-	0.9	1.3	18.0	26.1
Total	35.6	35.7	6.1	8.5	18.0	103.9

The Western Energy coal mine pays about $34.9 million in natural resource taxes, or about 97.7 percent of its $35.7 million in total taxes. Income taxes accounted for $3.3 million, or more than one-half of the total, in taxes estimated for the employees of the Colstrip generating plants and Western Energy coal mine.

Property taxes were about $4.1 million and income taxes approximately $3.1 million for the induced activity associated with Colstrip. Property taxes were relatively smaller for the employees than for the induced activity because more Colstrip and Western Energy workers live in Rosebud County, which has the lowest property taxes rates in Montana.

Statewide Benefits of Colstrip Taxes

The tax payments directly and indirectly associated with Colstrip benefit all the state's residents, not just those in Eastern Montana. This section presents a number of concrete examples of the statewide benefits.

- State government receives approximately $68.3 million in tax and royalty receipts directly or indirectly associated with Colstrip, representing about 4.5 percent of Montana Department of Revenue collections in 2008. Other taxpayers would have had to pay more or government expenditures reduced if it were not for these payments.
- As was mentioned earlier, about $11 million to $13million is collected in property taxes intended for school equalization. This amount would be distributed to all school districts across the state.
- The Colstrip generating plant itself pays about $26.3 million in property taxes on pollution control and electric generation equipment. Approximately $8.1 million of this total is intended for school equalization and would be distributed statewide.

- Much of the electricity generated at Colstrip is delivered to out-of-state customers via transmission lines. These lines pay property taxes to the counties through which it travels. Table 6.2 presents the estimated property taxes paid to these counties.

Table 6.2
Transmission Line Property Taxes by County

County	Millions of Dollars
Yellowstone	1.5
Missoula	0.6
Big Horn	0.3
Powell	0.3
Stillwater	0.4
Treasure	1.1
Broadwater	0.7
Wheatland	0.7
Granite	0.4
Meagher	1.1
Jefferson	0.5
Golden Valley	0.4
Mineral	0.8
Total	8.8

Summary

Colstrip directly and indirectly accounts for $103.9 million in taxes paid to state and local governments in Montana. About two-thirds of this total is paid to the state and benefit all Montanans. For example, a significant amount of the property taxes paid directly by Colstrip flows into the state's general fund and are used to fund school districts statewide. Further, the property taxes on the transmission lines associated with Colstrip are paid directly to 13 counties in central and western Montana.

7. Summary and Conclusions

The research question posed by this study is "what would the economy of Montana look like if Colstrip Steam Electric Station did not exist?" It is a hypothetical question – the facility has been in full operation for more than twenty years. Yet in a policy and political environment where the contributions of the plant to the state economy are poorly understood or perhaps taken for granted, it deserves to be carefully analyzed and answered.

Using a state-of-the-art policy analysis model of the Montana economy that has been peer-reviewed and used in dozens of other studies, we have carefully examined the contribution made to both the economy of eastern Montana as well as to the state economy as a whole by the continuing operations of the Colstrip generating facility. Our study has revealed the footprint of this single facility occupying less than three square miles in Rosebud County to be substantial. Comparing the actual economy to one that would exist if the operations of Colstrip were not present, we find that

- 3,740 jobs, including 2,688 private sector jobs,
- more than $360 million of personal income received by Montanans,
- $638 million in net output produced in Montana, and
- more than 7,700 additional people

exist in our state today whose presence is attributable to Colstrip operations. To state it another way, without Colstrip, the economy around us would be smaller, less prosperous, and less populous by these same amounts.

There are several aspects of Colstrip that lead directly to this impressive result. First, the facility pays wages and benefits to its workforce that are substantially above the state and regional average. When employees spend part of their money in the local and state economy, many other jobs are supported. Second, a huge expenditure of the plant is for a product that is totally made in Montana – namely, coal from the adjacent Western Energy Company mine. Keeping those dollars within the state greatly increases the ultimate impact of Colstrip operations.

Finally, the product made by Colstrip – electricity delivered to Montana and other states – does not displace or crowd out other Montana producers. Thus it's activities add to, rather than supplant or replace, other activities in the economy. The uses and demand for electricity continue to grow, and the continued operation of plants such as Colstrip is part of meeting that need.

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Exhibit B

The Economic Implications of Implementing the EPA Clean Power Plan in Montana

Preliminary Draft

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The Economic Implications of Implementing the EPA Clean Power Plan in Montana

Executive Summary

On August 3, 2015, the U.S. Environmental Protection Agency released its final rule for its Clean Power Plan directed at reducing emissions of greenhouse gases. As was the case with the preliminary rules announced in June 2014, those rules require states, including Montana, to submit plans that would result in reductions in state carbon emissions from new and existing electric generation facilities that hit a specified target by year 2030.

While there is in principle some flexibility in how states construct plans to comply with the emission targets set forth in the rule, the final rule's state-specific mandates for CO2 rate reductions for Montana power producers have been set at a level that drastically reduces the choice set for our state. A nationwide analysis conducted by SNL Energy shows that the plan's required 44 percent reduction in CO2 rate emissions for Montana in year 2030, relative to what status quo projected emissions would be in 2020, is the highest of any of the lower continental 48 states.

The EPA Clean Power Plan final rule – often referred to as 111(d) for the portion of the Clean Air Act that is cited as giving the Agency the authority for its actions – is the most significant economic event to occur in Montana in more than thirty years. Absent outcomes in markets for trading emissions allowances between states that are extremely difficult to predict, compliance with the rule will almost certainly entail the premature closure and decommissioning of the Colstrip Steam Electric Station, a coal-fired generator in southeast Montana that is the largest industrial facility in the state. It will also require significant new investment in replacement generation assets, as well as the transmission system improvement necessary to support them. As the regulation rolls out nationwide, it will significantly impact the price of wholesale and retail electric power.

As a means of helping Montana policymakers, businesses and households understand the implications of 111(d), NorthWestern Energy contracted with the Bureau of Business and Economic Research at the University of Montana to conduct an economic analysis of the impacts on the state economy that would result from actions necessary to comply with the rule. The findings of that analysis are contained in this report.

Summary of Findings

While Montana's compliance plan for 111(d) is not due to be submitted to the EPA until 2018, any compliance scenario will contain three changes from the status quo:

- the closure and decommissioning of existing generation facilities in Montana, with consequences for upstream (e.g., coal mine) and downstream (transmission line) assets, required to reduce CO2 emission rates in compliance with the rule;

- the construction and operation of new, less CO2-intensive generating facilities, with the necessary infrastructure (pipelines, transmission system improvements) to maintain the safe, reliable provision of electric power to Montana businesses and households, and

- changes in wholesale and retail electricity markets that reflect capital investments and the changing mix of generation regionally and nationally.

We have developed a specific scenario of compliance with 111(d) that contains each of these components. It is in conformance with the rule, which requires changes in existing facilities by the year 2022, and reductions in CO2 emission rates in conformance with the targets over the subsequent 8 year period. It provides for new generation and other infrastructure that replaces power that is currently supplied at facilities that would be shutdown, decommissioned, and remediated to conform with 111(d). And it reflects third-party projections of price changes that would result as the targets set by 111(d) come into effect regionally and nationally.

The BBER used its economic model, leased from Regional Economic Models, Inc. (REMI), and specifically calibrated to the Montana economy, to project two economic futures for our state. The first is a reference, status quo projection. The second is a projection of a future under compliance with 111(d). This future reflects all of the actions required to comply with the final rule, as well as changes in wholesale and retail electricity markets that result. These changes bring the economy to a different, lower, resting point as investment flows, population, and spending by businesses, governments and households respond.

The Economic Implications of Implementing the EPA Clean Power Plan in Montana

Impacts Summary

		Impacts by Year		
Category	**Units**	**2025**	**2035**	**2045**
Total Employment	Jobs	-7,137	-5,381	-3,715
Personal Income	$ Millions	-515.9	-556.3	-482.2
Disposable Pers. Income	$ Millions	-440.6	-481.2	-417.7
Selected State Tax Revenues	$ Millions	-145.6	-165.8	-152.0
Property Tax Revenues	$ Millions	-44.4	-74.5	-78.5
Output	$ Millions	-1,511.7	-1,407.4	-1,268.0
Population	People	-5,211	-10,731	-9,207

The difference between these two economic futures measures the economic impact of 111(d) for Montana. As shown in the table above, the impact of implementation is a significant loss to the state economy of jobs, income, output, tax revenues and population. Within three years of implementation of the compliance plan, the state economy

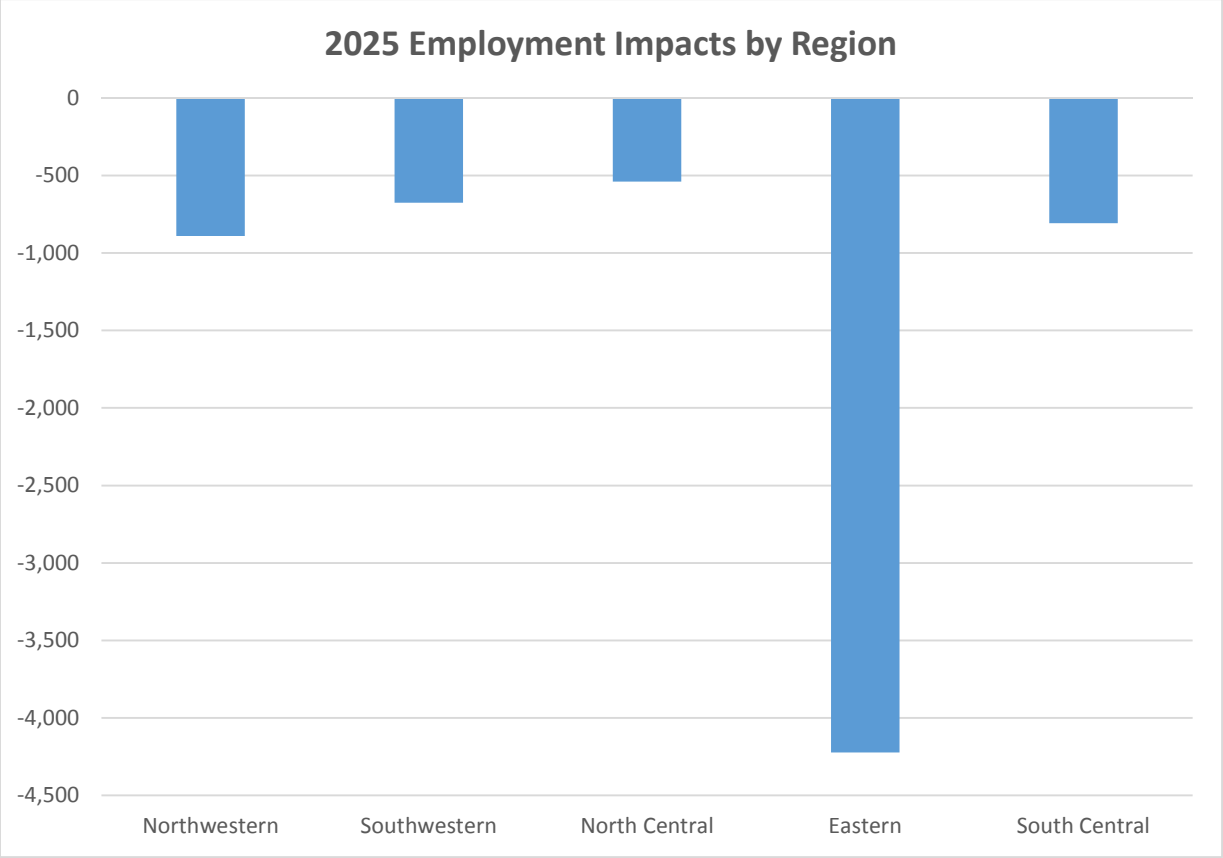
- suffers a job loss of more than 7,100 jobs, reflecting not only the regular and contractor jobs at all four units of the Colstrip generation facility, but also the neighboring coal mine, as well as the local government jobs supported by the significant property tax bills those facilities pay; and all of the changes elsewhere in the economy that result from those losses;

- incurs a loss of over $500 million in annual income received by Montana households which is made larger by the fact that the jobs lost due to 111(d) pay well in excess of the Montana average;

- realizes a loss of more than $1.5 billion in gross output (sales) by Montana businesses and other organizations, as Montana swings from being a state with significant energy exports to a state that must rely on imported power from other states and regions in periods of heavy load or during generation curtailments;

- ultimately realizes a decline in population, particularly in working-aged families and their children, as economic opportunities in our state worsen relative to other states.

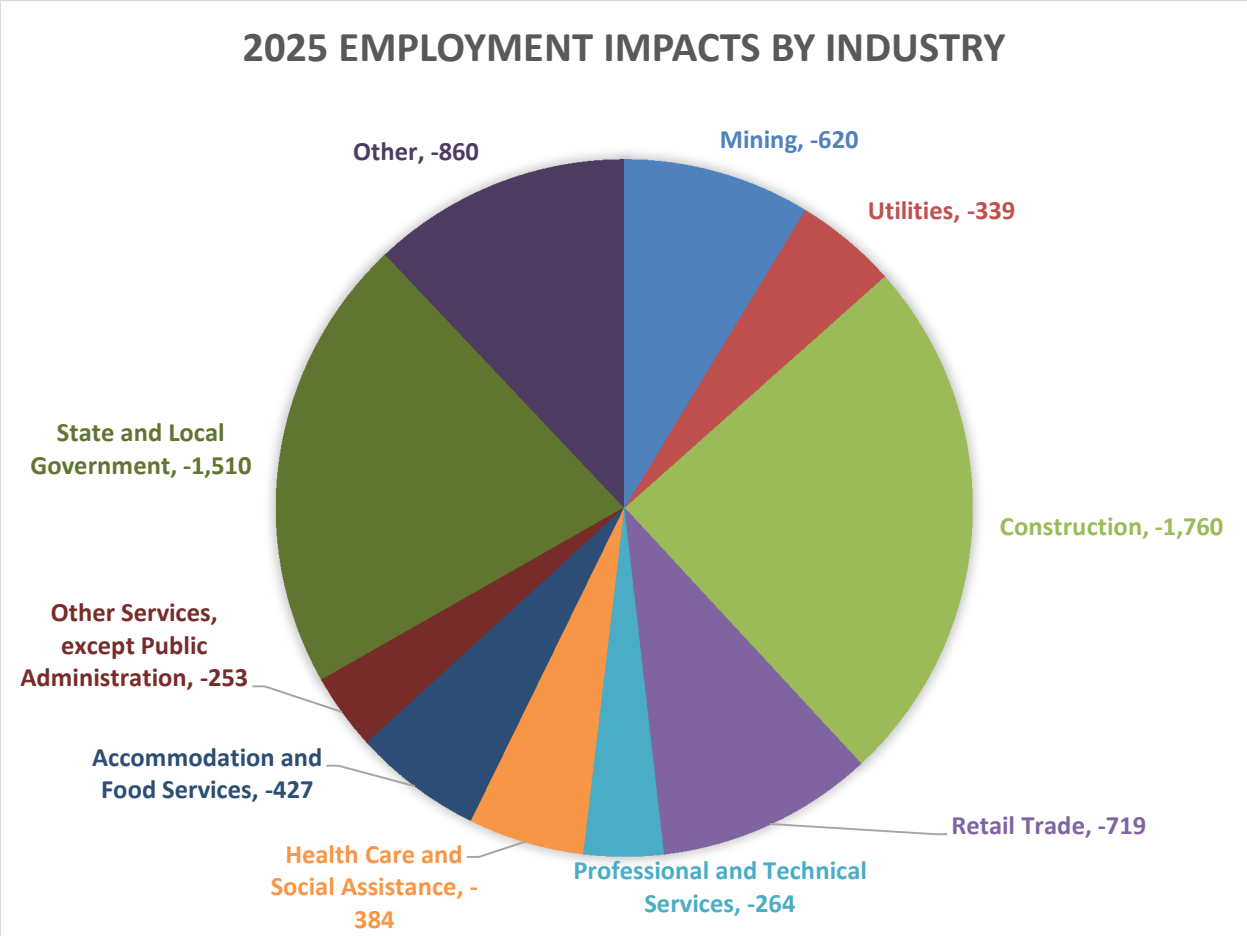
The economic impacts of 111(d) in Montana have a wide footprint, both geographically and across industries. But their effect is especially pronounced in eastern Montana, where both the Colstrip generation facilities and the Western Resources coal mine that supplies them are located. The more than 4,000 jobs lost in eastern Montana counties as a result of 111(d) comprise almost 7 percent of all jobs in the region, and two thirds of the decline in output that occurs statewide is incurred by businesses and other organizations in the eastern 14-county region of the state. Yet as the figure below makes clear, other regions of the state are significantly impacted by 111(d), through the impact of higher electricity prices as well as declines in state and local property tax revenues.



The impacts of 111(d) in Montana are large in some industries you would expect, namely, utilities and mining. The shutdown of the Colstrip SES and the closure of the Western Energy Company mine contribute to those declines directly. But these are not the two industries that

are hit the hardest in terms of job losses in year 2025, as shown in the pie chart on the next page. The job decline of 1,760 jobs suffered by construction industries and the 1,510 jobs lost in state and local government are significantly larger than those two sectors which would seem to have a closer connection to the power plant itself.

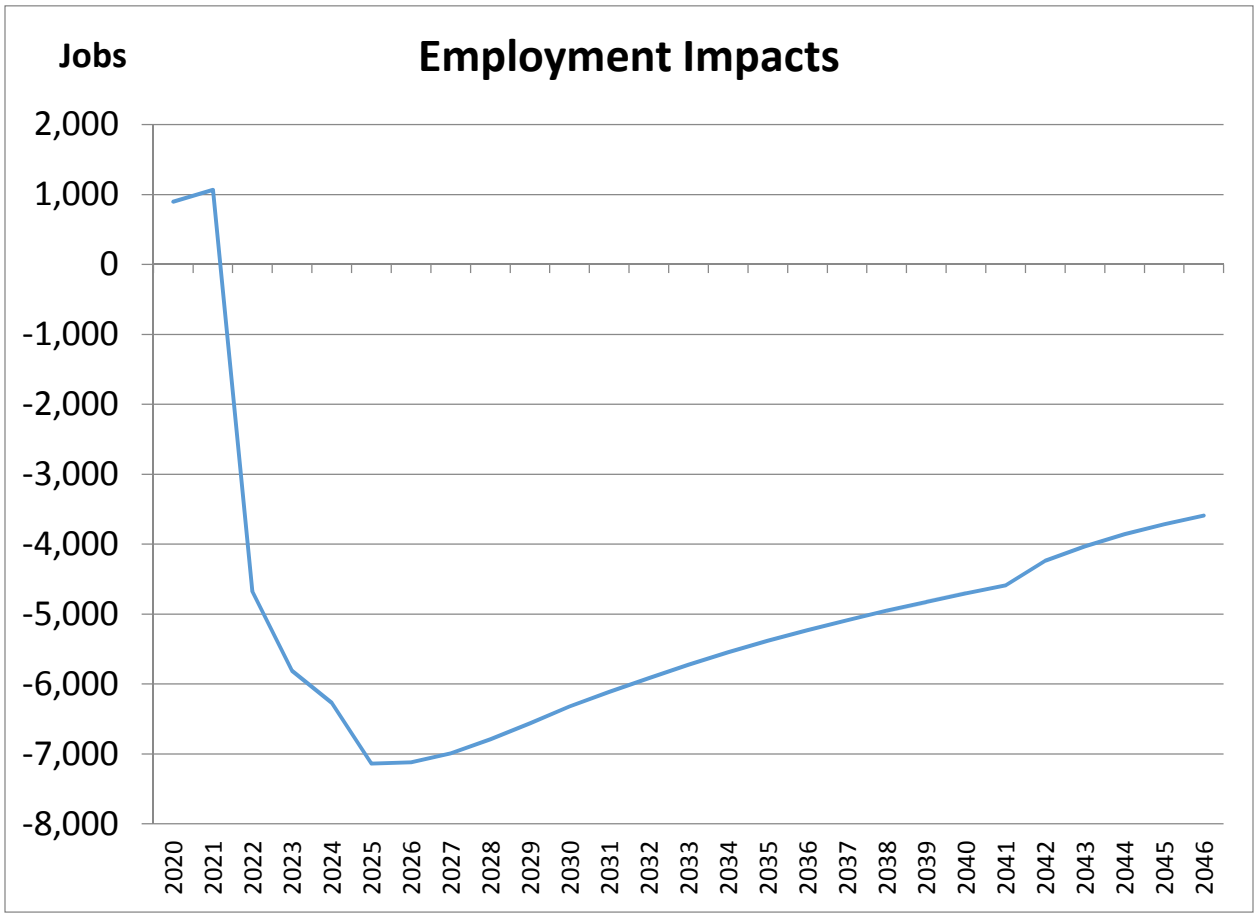
The relative size of these negative job impacts among industries comes about for several reasons. First, both utilities and mining are capital-intensive industries, and so the jobs lost understate the economic scale of the changes. The construction industry is just the opposite, with labor representing a large portion of total industry expenses. Declines in that industry come about – especially in the beginning of the compliance period – as the sudden decline in demand creates a situation where both residential and commercial stocks of capital are much higher than needed. Government job declines occur due to the significant declines in both population, which reduces demand for government services, and property tax and other tax revenues, which fund those services.



There is considerable variability in the impacts of 111(d) over time, although for the entire period studied by BBER those impacts remain large. Before 2022 there are some positive impacts on the economy as construction projects for a new gas turbine, gas pipeline and new transmission infrastructure that is necessary to serve Montana customers is underway. From 2022 forward, however, impacts are dominated by (i) the upstream and downstream impacts of the closure of Colstrip, as well as the facility's contribution itself, whose sizable economic contributions were

noted in earlier research (Barkey and Polzin, 2010), (ii) the rate increases borne by Montana businesses and residents to pay for the significant new investment needed to provide replacement baseload generation, and (iii) the changes in electricity prices borne by all wholesale and retail purchasers of electrical power as market prices for merchant power move upwards.

Not all of the changes which are due to 111(d) produce negative impacts. The construction and operations of a 250 MW combined cycle combustion turbine, including building a new pipeline to serve its natural gas needs, the remediation activities at the Colstrip site, and even the reduction NorthWestern Energy's property tax bill from shedding generation assets that is partially passed to rate payers all result in some increases in economic activity. But the net result of all the changes, as is demonstrated above, is profoundly negative for every year studied after year 2022.



Other important findings of the economic impacts of 111 (d) include:

- With income of Montana households down by more than half a billion dollars per year due to the effect of 111(d), the spending power of Montanans as a group is significantly lower. The annual after-tax income of Montana households is lower in total by $440.6 million in year 2025 statewide.

- The 111(d) final rule has a disproportionate impact on higher income jobs. The average earnings of the jobs lost in year 2025 is almost $66,000 per job, growing to nearly $80,000 per job (all dollar figure expressed in terms of 2015 spending power) by year 2045. This takes our state in the opposite direction we need to go to close the earnings gap with other states.

- The tax implications of 111 (d) compliance are significant, for at least two reasons. First, electric power generation and coal mining are capital intensive businesses, with a large footprint in the mix of taxable value as part of local property taxes. Also, the coal business contributes significantly to state tax receipts through severance taxes and lease payments. We estimate the decline in state and local tax and non-tax revenues due to 111(d) to be in excess of $145 million per year in 2025.

- The loss of jobs and job opportunities from implementation of 111(d) in Montana results in working age people leaving the state, taking their children and future children with them. The decline in school aged population, particularly in smaller communities, could challenge the viability of schools. The population declines due to 111(d) peak at over 10,700 people overall, with school-aged populations declining by about 3,000.

The scale of these negative economic impacts can be seen by comparison with other economic events. The half billion dollar decline in personal income sustained in year 2025 due to the implementation of the Clean Power Plan in Montana is roughly half as large as the decline in personal income that occurred in 2009 in Montana as a result of the Great Recession. The loss in personal income due to 111(d) is greater than the total personal income of all but 12 Montana counties.

The Direct Effects of the Clean Power Plan

Economic changes of the magnitude reported here come about because of the nature of the changes required as a result of the Clean Power Plan. It is useful to categorize these changes into three groups:

- Direct effects, which represent changes in income flows, tax payments, employment, and other spending resulting from closures or new investments conducted by power producers themselves to bring CO2 emissions rates into compliance;

- Indirect effects, or changes in non-utility businesses that are closely linked to generation activity (e.g., the Western Resources mine);

- Induced effects, which refer to the ultimate reaction of trade flows, investment, migration, and spending in the economy at large by consumers, businesses and governments as they respond to changes in sales, job opportunity and demand.

At the beginning of this causal chain are these direct effects -- the sequence of decisions and changes made necessary or inevitable to comply with the final rule. While the state's plan has not been specified, the dominance of coal-fired generation in Montana's overall portfolio of generating assets, and 111(d)'s target of a 44 reduction by year 2030 in CO2 emission rates by year 2030 appears unachievable without closure of coal fired generation. The scenario we have analyzed in this study has three components:

- the premature retirement of generation and transmission assets;

  This includes the closure of units 1-4 of the Colstrip SES, which go offline in 2022,

closure of the adjoining Western Energy Company coal mine, and the deactivation of the 500 KV transmission line west of Colstrip.

- construction and operation of new, gas-fired generation and transmission to serve Montana load;

  This includes the construction and operation of a 250 MW CCCT in Billings, with construction of a gas supply line to serve its gas needs and other connecting infrastructure, and the construction and operation of a new 230 KV transmission line between Three Forks and Great Falls.

- changes in regional/national electricity markets due to 111(d) implementation elsewhere;

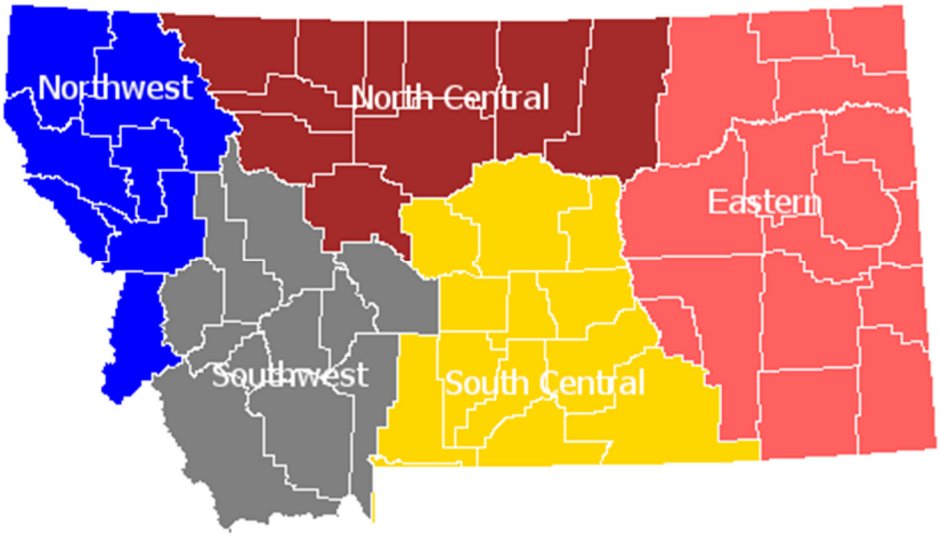
  Based on a NERA state-by-state analysis of the old, preliminary rule, we project that average electricity prices will go up by an average of 12 percent nationwide and by 16 percent for Montana.

Compliance with 111(d) combines actions that have a disproportionate impact on eastern Montana (closure of Colstrip) with other changes that propagate statewide (loss of property/severance tax revenues, increases in electricity prices). The results of this analysis reflect the nature of these direct impacts.

Estimates of Economic Impacts

The basic tool used in this study to assess the economic implications of 111(d) is an economic model, calibrated to represent the interactions in the Montana economy, leased from Regional Economic Models, Inc. The REMI model is one of the best known and most respected analytical tools in the policy analysis arena, and has been used in more than a hundred previous studies as well as dozens of peer-reviewed articles in scholarly journals. It is a state-of-the-art econometric forecasting model that incorporates dynamic feedbacks between economic and demographic variables. The REMI model forecasts employment, income, expenditures and populations for counties and regions based on a model containing over 100 stochastic and dynamic relationships as well as a number of identities. A full explanation of the design and operation of the model can be found in Treyz (1993).

The model used in this study disaggregated the state economy into five regions: Northwest, Southwest, North Central, South Central, and Eastern. It explicitly recognizes trade flows that exist between these regions, as well as between the regions and the rest of the world.



The model utilizes historical data on production, prices, trade flows, migration and technological change to calibrate the relationship between five basic blocks of the regional economy: output, labor and capital demand, population and labor force, wages and prices and market shares. The changes in production, labor demand and intermediate demand caused by the changes that occur due to 111(d) cause these blocks of the economy to react and adjust to a new equilibrium. As described above, the difference between the baseline and the alternate scenario is the ultimate impact of compliance with the Clean Power Plan.

The essential philosophy of the model is that regions throughout the country compete for investment, jobs, and people. When event occur in a region, they set off a chain reaction of events where dollars flow towards better investment and production opportunities, followed over time by a flow of workers and households towards employment opportunities and higher wages. The model embodies an 82-sector input-output matrix that describes the technological interdependence of production sectors of the economy, as well as extensive trade and capital flow data to determine the share of each sector's demand that can be met by local production.

Conclusion

This study reports on what could potentially be the largest economic event to occur in Montana in more than three decades. The sequence of events that would have to occur to bring the emission rates of Montana's electric generating facilities into compliance with the percent reductions called for in the EPA's Clean Power Plan – reduction rates which are higher in Montana than any other state in the country – would exact a toll on economic activity in terms of jobs, income, sales, tax revenues and population. While these economic impacts would fall most heavily on eastern Montana, the nature of the changes required by the regulation as well as the changes in electricity prices overall would impose sizable negative impacts on all regions of the state.

Specifically, we find that the implementation of 111(d) in Montana would

- result in the loss of more than 7,000 jobs in year 2025, which have average earnings per job of almost $66,000,
- impose a reduction of more than half a billion dollars in income received by Montana households, equal to half of the reduction suffered by the state in the Great Recession,
- result in a decline in sales by Montana businesses and other organizations of more than $1.5 billion, and
- cause a population loss of over 10,000 people due to changes in demand and job opportunity.

About the BBER

The Bureau of Business and Economic Research (BBER) was founded as the research arm of The University of Montana's School of Business Administration in 1948. As set forth in its mission statement,

"The purpose of the Bureau is to serve the general public, as well as people in business, labor, and government, by providing an understanding of the economic environment in which Montanans live and work."

BBER has developed over the years to become one of the most sought-after sources of information and analysis on the Montana economy. It has published the Montana Business Quarterly, its award-winning business periodical, since 1962, and has conducted the Montana Poll, a quarterly sentiment survey of the Montana adult population, since 1980.

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