Insight Brief

Energy Reinvestments in the Intermountain West Can Save Ratepayers Hundreds of Millions

Case study reveals portfolios of solar, wind, and utility-scale battery storage can deliver more affordable power while maintaining reliability and improving community health.

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SUMMARY

Montana's Colstrip Generating Station, one of the nation's largest remaining coal-fired power plants, is at a watershed moment. A managed phase-out of the coal-fired power units to a portfolio of low-cost, carbon-free resources would significantly benefit Montana ratepayers. Analysis from RMI demonstrates that such a portfolio can effectively ensure reliable power supply while saving ratepayers $500 million to $1.17 billion over the next 30 years. Regulators and utilities need to act quickly to maximize the benefits for Montana ratepayers. The most ideal time to deliver the cost savings and economic growth of reinvesting in the Colstrip plant is now.

INTRODUCTION

Located in Rosebud County, Montana, the Colstrip plant, operated by Northwestern Energy, has adversely affected the economy and health of the surrounding communities. For its customer base — spread across Montana, Washington, and Oregon — the plant is becoming financially burdensome, with $34 million in losses attributed to its uneconomic dispatch in the past year based on RMI's Economic Dispatch Dashboard. Over the past decade, emissions from the Colstrip plant have been linked to $2.1 billion in health costs with 151 premature deaths, 188 emergency room visits, and more than 90,000 cases of asthma symptoms.

A variety of pressures — economic, policy-driven, and environmental — are making reinvestments in the Colstrip plant and its surrounding communities increasingly attractive. On the policy front, two of the Colstrip plant's owners, Puget Sound Energy and Avista, are required by the state legislative mandates in Washington and Oregon to phase out coal within the next few years (2026 in Washington and 2032 in Oregon). At the same time, the high capital costs of compliance with environmental regulations, such as the US Environmental Protection Agency (EPA)'s Mercury and Air Toxics Standards (MATS) and greenhouse gas rules, raise critical economic questions about the continued operation of the Colstrip plant.

Similar pressures are prompting other regions to retire aging coal plants by the 2030s. These areas are exploring reinvestments in alternative portfolios that are economically attractive to local communities. Similarly, Northwestern Energy's current rate case presents an opportunity to reassess its investment strategy for the Colstrip plant and explore alternatives that could deliver significant savings for ratepayers. In July 2024, Northwestern Energy submitted a proposal to the Montana Public Service Commission (MT PSC) to establish a "Reliability Compliance Balancing Account." This account would fund upgrades at the Colstrip plant to comply with new federal environmental regulations, enabling operations to continue until at least 2042, with compliance costs passed on to customers.

We recommend that Northwestern leverage innovative financing mechanisms, reinvest in carbon-free resources, and retire the coal-fired power units as soon as feasible, consistent with its peers across the country. This approach would maintain resource adequacy while offering clean, low-cost services to Montana ratepayers.

ENABLING POLICIES AND SUCCESSFUL EXAMPLES

Minnesota provides a compelling transition example where stakeholders worked together to build new clean energy, enabling the retirement of a costly coal plant. Advocates developed modeling to demonstrate to the state utility commission that the new resources could reliably and more cheaply replace Xcel Energy's Sherco coal plant. Xcel then leveraged the generator replacement process to transfer Sherco's interconnection rights to new resources. At the site, 710 MW of on-site solar and a 10 MW/1000 MWh long-duration energy storage facility have replaced the first retired generator. Additional on-site battery storage along with thousands of megawatts of off-site solar, wind, and battery storage connected through a generation tie-line will provide the rest of the replacement resources to enable further generator retirements.

Xcel was able to advance these projects quickly and cost-effectively, utilizing FERC's generator replacement process to bypass interconnection queue delays as well as Inflation Reduction Act (IRA) production tax credits (PTC) and investment tax credits (ITC) bolstered by the additional 10 percent energy community tax credit bonus. The company also worked closely with workers and the host communities to build local support. Importantly, to maintain grid stability and reliability, one of the Sherco units will still serve the grid as a synchronous condenser.

Montana is well-positioned to leverage federal resources to support reinvestment in local communities. The IRA tax credits, particularly the bonus adders for energy communities, can directly benefit the renewable projects developed in the nearby areas, such as the Northern Cheyenne Tribe. These bonus adders provide additional financial incentives for clean energy projects that deliver economic benefits for underserved and Tribal communities, making the clean energy investments even more economically competitive than incumbent assets.

In addition to the tax credits, there are tools available for supporting a smooth transition for the Colstrip plant while minimizing the impact on ratepayers. Two powerful tools are securitization and Energy Infrastructure Reinvestment (EIR) financing:

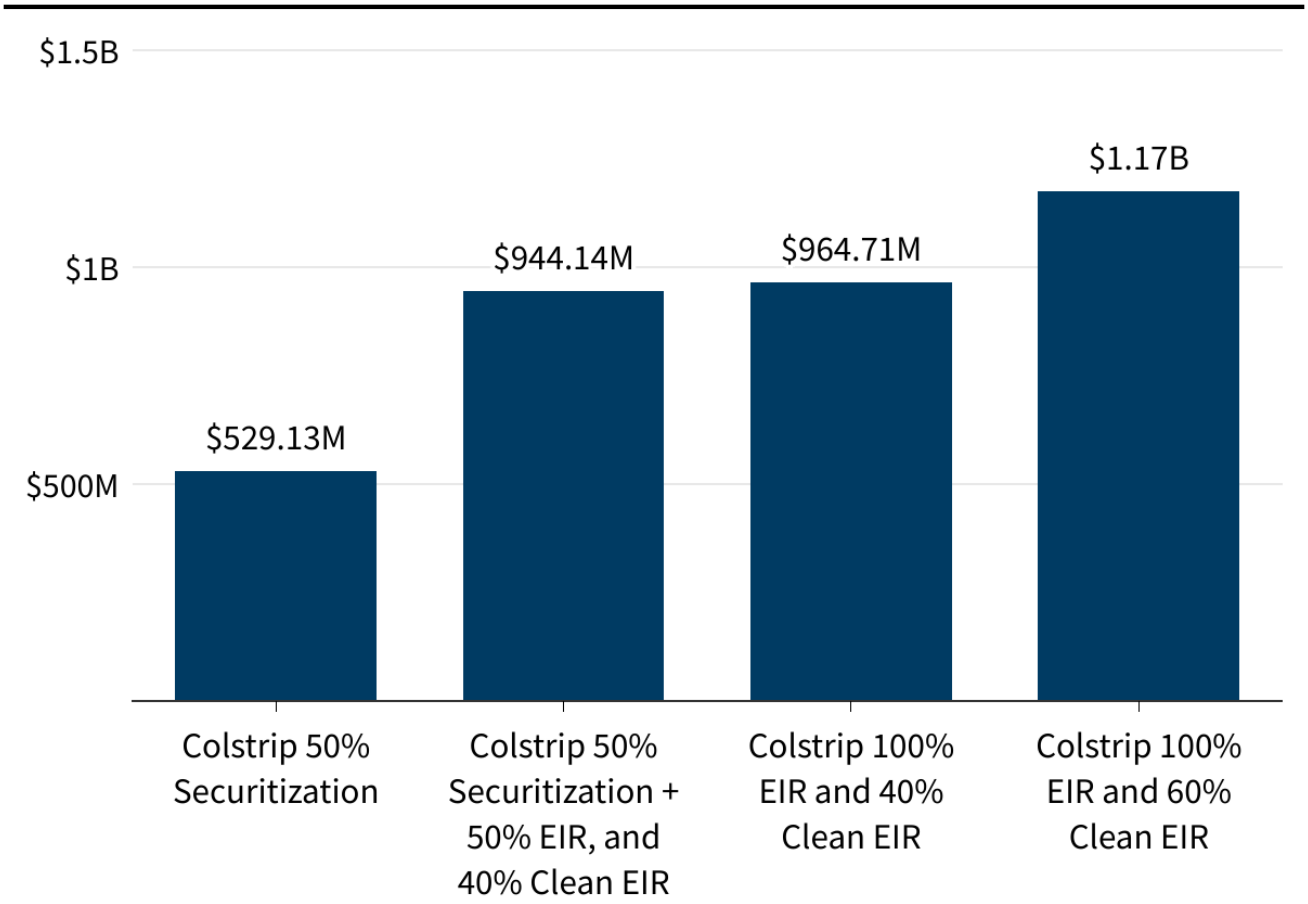
- Securitization allows utilities to recover the remaining plant balance of retired coal plants by issuing low-interest, ratepayer-backed bonds. Securitization legislation was enacted in Montana in 2019 but has yet to be utilized to accelerate the transition of the legacy assets. Colstrip plant could serve as a compelling use case for this approach.
- EIR financing provides a refinancing pathway to support the repurposing of energy infrastructure, in this case using guaranteed federal loans. By leveraging these mechanisms, Montana ratepayers can experience a reduced cost burden from the operation of the Colstrip plant while freeing up capital for clean energy investments.

RMI has analyzed Iowa and Missouri to demonstrate the benefits of both EIR and securitization for the retirement of coal plants.

RENEWABLE ENERGY PORTFOLIOS — A MORE AFFORDABLE ALTERNATIVE

RMI's analysis of the Colstrip plant indicates that, with enabling policies and financing mechanisms in place, Northwestern Energy can save Montana ratepayers $500 million to $1.17 billion in the next 30 years by retiring the Colstrip coal-fired power units in 2028 and replacing them with carbon-free energy portfolios that meet the resource adequacy requirements.

Exhibit 1. Savings Comparison of a Clean Energy Portfolio with Innovative Financing Scenarios



This chart shows the net present value (NPV) savings in 2024 dollars of continuing to run the Colstrip plant (the business as usual case, or BAU) vs. a clean energy portfolio through 2058. In the BAU scenario, the Colstrip plant is assumed to retire in 2042, and a generic replacement cost is estimated for 2042 through 2058 using NREL Cambium's short-term marginal cost of electricity. A central tax credit bonus case is used, which assumes a 10% adder to the PTC for solar and wind, and 15% adder to the ITC for battery storage. See the technical appendix for further details.

Source: RMI analysis

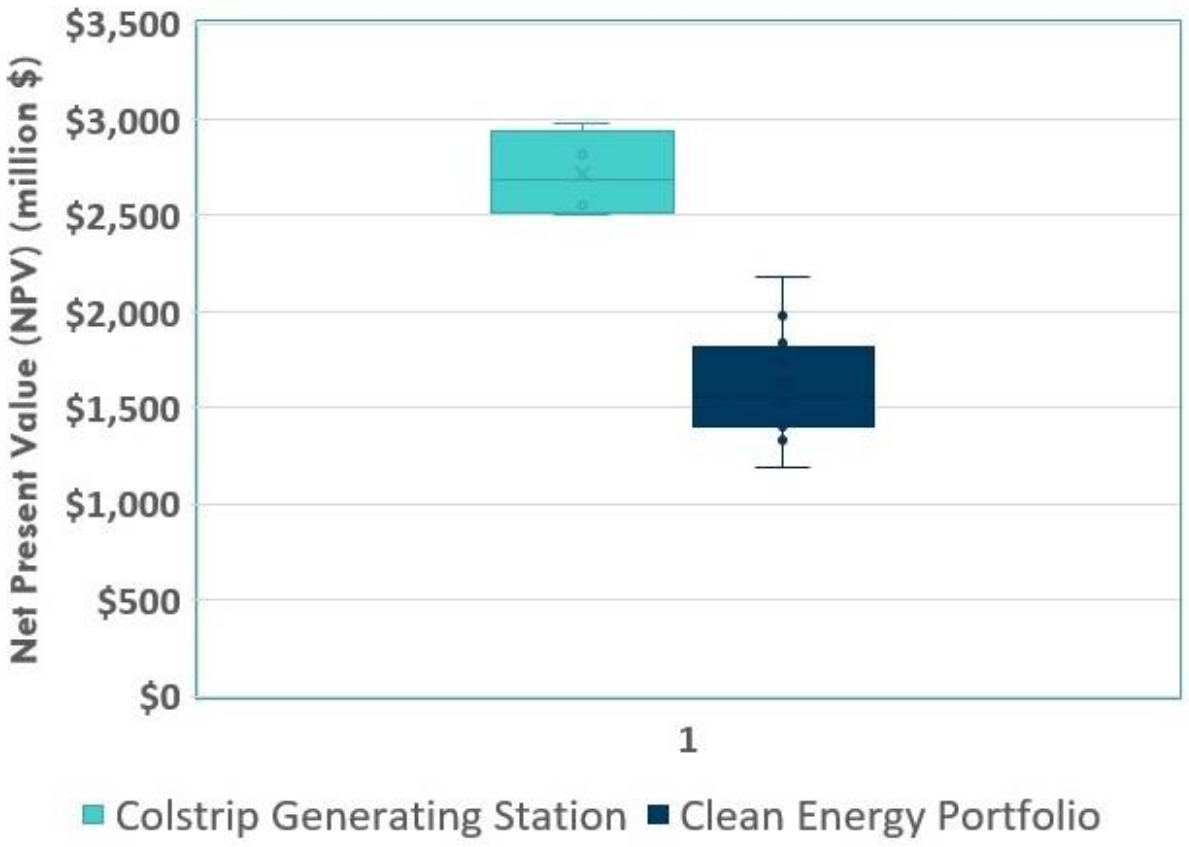
A range of factors was considered in the analysis, including EIR financing parameters, tax credit bonus adders, and carbon capture and storage (CCS) incentives. Exhibit 2 below illustrates the range of costs under different sensitivities. The carbon-free energy portfolios are cheaper than the coal-fired power units in all scenarios, with savings increasing if 1) CCS is installed and Colstrip runs at its historical capacity factor, rather than a higher capacity factor; 2) the leverage of EIR increases; and 3) the uptake of the tax credit bonus adders (energy communities and domestic content) increases.

While the incoming presidential administration has announced plans to potentially weaken some of these rules and incentives (such as the greenhouse gas rules), these standards remain currently in place and may take years to change, and future administrations could look to reinstate or enact even more stringent emissions standards.

Regulatory uncertainty and long lag times between construction and decisions mean that Northwestern is faced with a near-term decision to continue investing in the Colstrip plant's coal-fired generation and potentially costly

regulations or evaluate reinvesting in Colstrip and replacing these problematic units with cleaner and cheaper alternatives. It would be imprudent to not seriously evaluate a range of possibilities, including the CCS compliance cost and tax credit bonus to inform investment decisions.

Exhibit 2. Cost Comparison of Colstrip Generating Station and Clean Energy Portfolios



Note: *The chart above shows the range of costs for the continual operation of Colstrip plant through 2042 with a generic asset replacement from 2042 to 2058 against the range of costs for the retirement of Colstrip coal-fired power units and replacement with a clean energy portfolio under various sensitivities. For the Colstrip plant, compliance with MATS represents the low estimate, whereas compliance with both MATS and the power plant carbon pollution standards represents the high estimate. For the clean energy portfolio, various cost sensitivities are represented under various uptakes of securitization and EIR as well as tax credit bonus adders that assume no bonus adders, a central bonus adder case, and a high bonus adder case.*

THE IMPORTANCE OF RESOURCE ADEQUACY ASSESSMENTS

Ensuring a reliable power supply is a key consideration. Our analysis evaluates a range of replacement portfolios designed to meet the same resource adequacy requirements as the Colstrip plant. These portfolios are crafted to match Colstrip's capacity accreditation during winter and summer, as well as its total annual generation. We used different input values on Colstrip's capacity accreditation and annual capacity factors, reflecting a range of assumptions from Northwestern and industry experts around the peak capacity contribution and energy service required for the Colstrip plant.

The scenario results shown above use the capacity accreditation assumption from the industry expert group (Energy Systems Integration Group, or ESIG), as well as the historical capacity factors based on the plant's performance since 2020, which we believe can best represent the capacity and energy contribution needed from the replacement resources. The portfolios selected based on these inputs include 763 MW of solar, 918 MW of wind, and 364 MW of battery storage to match the services provided by the portion of the Colstrip plant owned by Northwestern after the acquisition of additional shares from Puget Sound Energy and Avista.

While this resource adequacy analysis is high-level, it identifies key trends in the Colstrip plant's operations and underscores the need for transparent investigation in Northwestern Energy's upcoming Integrated Resource Plan (IRP). Importantly, the nature of these replacement resources allows for a phased development approach. Rather than investing in large coal or gas plants, Northwestern can begin building renewable energy and battery storage projects now and scale them up over time. This incremental strategy ensures that replacement resources are ready and operational when the coal-fired units retire. This will minimize risks and maximize the benefits of these investments to ratepayers.

REGULATORS AND THE UTILITY NEED TO ACT NOW

Northwestern Energy and the Montana Public Service Commission (MT PSC) are responsible for maximizing benefits to ratepayers. Acting soon will help secure a reliable, affordable, and clean electricity supply for Montana ratepayers while creating economic opportunities for local communities.

RECOMMENDED ACTIONS FOR NORTHWESTERN ENERGY:

- In the current rate case, prioritize engaging with stakeholders to identify and leverage available policy and financial incentives that support a coal-to-clean reinvestment. This proactive approach ensures investments align with the long-term interests of Montana's ratepayers.
- In the upcoming IRP, thoroughly assess the impacts of managed phaseout of the coal-fired power units and reinvesting in more affordable energy technologies. Develop portfolio scenarios that include renewable energy and storage solutions, and consider EIR financing to inform optimal resource selection.

RECOMMENDED ACTIONS FOR MT PSC:

- In its decisions on Northwestern Energy's rate case, emphasize the need to evaluate retiring the coal-fired power units and reinvesting in more affordable energy technologies. Direct the utility to explicitly incorporate EIR financing and/or securitization strategies in its IRP modeling process.
- Look to the precedent set by other public service commissions, such as in North Carolina and South Carolina, which ordered the utilities to assess federal funding opportunities such as EIR in the upcoming IRP.

TECHNICAL APPENDIX

- **Clean Energy Portfolio Construction:** The clean energy portfolio (CEP) was constructed to match the summer and winter accredited capacity of the Colstrip plant. This includes contributions from wind, solar, and storage resources, which were assumed to meet the capacity needs conservatively. Three capacity accreditations were assessed throughout the portfolios: Northwestern's own accreditation of the Colstrip plant at 98%–100%, ESIG's estimated coal plant accreditation at 83%, and GridLab's specific capacity accreditation of the Colstrip plant at 54%. These differences highlight the uncertainty in capacity assumptions, affecting the CEP design. The CEP was further evaluated to ensure it meets the expected energy output of the Colstrip plant by matching the same total annual energy output in terawatt-hours based on capacity factors. Projected capacity factors included two different scenarios: the historic capacity factor of the Colstrip plant from 2020 to 2023 at an average of 69% and a higher scenario with a capacity factor of 90%. If the CEP was found to be short of the required energy, additional resources, primarily wind and solar, were incorporated to ensure alignment. While this approach ensures the CEP

provides energy during peak demand comparable to the Colstrip plant, it does not always guarantee equivalent energy output.

- **Timeframe of the Analysis:** The analysis spans a 30-year timeframe (2028–2058), capturing the full life-cycle financial impacts of CEP implementation. As Northwestern has not released specific plans or timelines for the Colstrip plant's replacement after its scheduled retirement in 2042, the analysis excludes any post-2042 replacement. This conservative assumption potentially underestimates the relative cost advantages of the CEP. In a sensitivity analysis using a shortened timeframe (2028–2042), the result significantly favored the CEP over the Colstrip plant, reflecting the cost efficiency of earlier clean energy adoption.
- **CEP Costs:** We use NREL's 2024 annual technology baseline (ATB) for resource costs, utilizing moderate learning curves over a 30-year cost recovery period.
- **Transmission:** Transmission feasibility or costs are not included in the scope for this analysis. Including transmission constraints can potentially increase the cost of deploying clean energy. However, it requires a more geographically granular analysis to determine whether the proposed renewable projects rely on additional transmission investments. We recommend Northwestern include a more comprehensive transmission feasibility assessment in the upcoming IRP.
- **Colstrip Plant Metrics:** We use Northwestern's depreciation data for the Colstrip plant's remaining plant balance of $299 million, with $30 million in accumulated deferred income taxes. To estimate fixed and variable operating and maintenance costs, we use FERC Form 1 data. We use EIA 923 to estimate heat rate and heat content and use Northwestern's coal supply agreement to obtain coal costs, which we inflate annually, rather than quarterly as stated in the contract, for modeling simplicity. CO_2 emissions are gathered from EPA. For the MATS capital cost and annual operating and maintenance costs, we use the Burns and McDonnel's 2024 study for Colstrip plant. We also use NREL's ATB for coal retrofit carbon capture and storage cost metrics, along with an NREL study on additional costs for transportation and storage of CO_2
- **Generic Asset Replacement Metrics:** We use NREL's Cambium model to estimate a marginal cost equating a dollar per MWh replacement value for Colstrip's annual generation. We use the mid-case in the region where the Colstrip plant is located, using the total busbar costs in 2040 and inflating this cost to the appropriate years.
- **Utility Financial Metrics:** We use Northwestern Energy's proposed capital structure of 46.81% equity ratio and a 10.8% return on equity, with an overall 7.49% rate of return, for all clean assets. For all assets associated with Colstrip plant, we use the prior settlement agreement of a 50% equity ratio, 10% return on equity, and an overall 8.25% rate of return.
- **Tax Credits:** We assume that the PTC is taken for solar and wind, the ITC is taken for storage, and that utilities opt out of the ITC normalization requirements. We assume a tax credit transferability discount of 5% (for example, the utility sells its tax credits in the transfer market made possible by the IRA for 95 cents on the dollar). Tax credit bonuses for the PTC and ITC include up to a 10% bonus for locating projects in an energy community, and a 10% bonus for using domestic materials on the project. Tax credit sensitivities look at a case with no bonus adders, a central case that assumes a combined 10% bonus adder for solar and wind projects and combined 15% for battery storage projects, and a high case that assumes all renewable projects receive the full 20% in bonus adders.
- **Securitization Modeling Assumptions:** For securitization, we assume a 30-year bond tenor, with a single tranche of an AAA-rated bond and an expected tenor of 30 years.
- **EIR Modeling Assumptions:** For EIR loans, we assume the maximum tenor allowed under the law, 30 years. EIR loan rates are 37.5 basis points above Treasury rates. We assume as a baseline EIR financing equivalent to the debt ratio of the utility for new clean energy. For Colstrip plant EIR financing scenarios, EIR financing is taken out at an amount equivalent to the unrecovered plant balance and is assumed to finance the recovery of the coal plant balance. For clean EIR financing, the percentage of

EIR is the amount of EIR financing for new clean assets, with the remaining amount financed by the utility's proposed equity and debt split. Since EIR serves to reduce customer costs, both in the near term and on an NPV basis, it frees up rate headroom and can make it possible for utilities to pull forward new clean asset deployments. As such, swapping out a portion of utility equity with EIR debt can still leave utility shareholders in an improved position by accelerating practicable opportunities to deploy capital, albeit with slightly more leverage, rather than delaying equity-richer investments into a less certain future. Finally, we assume EIR loans are structured as off-balance sheet financings for capital recycling scenarios without recourse to the utility's balance sheet. For more details on the capital recycling approach and modeling, see this insight brief.