WESTMORELAND

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**ATTN: Docket ID No. EPA-HQ-OAR-2025-0124; FRL-12674-01-OAR**

Administrator Lee Zeldin
C/O EPA Docket Center (EPA/DC)
Docket ID No. EPA-HQ-OAR-2025-0124; FRL-12674-01-OAR
U.S. Environmental Protection Agency

*Submitted via Federal eRulemaking Portal (Regulations.gov)*

**RE: Comments of Westmoreland Mining Holdings LLC ("Westmoreland") on the "Repeal of Greenhouse Gas Emissions Standards for Fossil Fuel-Fired Electric Generating Units" 90 Fed. Reg. 25752 (June 17, 2025) (a/k/a, the "Proposed Rule"). Docket ID No. EPA-HQ-OAR-2025-0124; FRL-12674-01-OAR**

Dear Administrator Zeldin:

Westmoreland Mining Holdings LLC ("Westmoreland") presents the following comments regarding EPA's proposed rulemaking titled "Repeal of Greenhouse Gas Emissions Standards for Fossil Fuel-Fired Electric Generating Units," published in the Federal Register at 90 FR 25752 on June 17th, 2025 (hereafter the "Proposed Rule").

Founded over 150 years ago, Westmoreland has long been a cornerstone of America's energy generation sector. With a track record of innovation and service, together with a zero-harm commitment to worker safety, our Company has energized and supported our communities and businesses since the start of modern industrialization. As particularly relevant to this proceeding, Westmoreland supplies all coal required by the mine-mouth Colstrip Generating Station powerplant in Colstrip Montana (Colstrip). The Colstrip Power Plant, and the Rosebud mine that supply it are the economic engine of this rural and otherwise economically disadvantaged part of the State. As a result of the well-paying jobs at the mine and power plant, Colstrip is a prosperous community with a robust local tax base, excellent schools, and quality government services. For example, Colstrip has a median household income that is more than 75% higher than the state average and a greater percentage of adults with high school diplomas (98.8%) than Bethesda, Maryland (98.3%), let alone Rosebud County, Montana (85.1%). And Colstrip powers hundreds of thousands of homes and businesses in a part of the country that includes little reserve capacity and where unique state laws like the Montana Major Facility Siting Act make bringing any new power plants online particularly challenging. If allowed to continue current operations, the Colstrip Power Plant is anticipated to contribute to over $17 billion in economic production between 2028

and 2043.[1] But if left in place, the current CPS Rule would devastate this community, and the state as a whole, with a closure of the Rosebud mine and associated Colstrip Plant resulting in loses of over 3,262 jobs, a loss of over $240 million in income received by affected Montana households, over a billion dollars in lost economic output, and a shortfall of more than $100 million in state government revenue.[2]

The Proposed Rule rightly preserves EPA's proper role of protecting human health and the environment in a practical and cost effective manner, with proper balance of technical and cost considerations driven by proven solutions and tradeoffs. Of equal importance, the Proposed Rule properly repudiates past attempts to usurp Congress' constitutional role by fundamentally reshaping industrial sectors based on policy preferences, without clear statutory authorization.

Accordingly, Westmoreland supports both the Proposed Rule's rescission of the unfounded best system of emissions reductions (BSER) for fossil fuel fired electric generation units promulgated in the May 9, 2024 Carbon Pollution Standards Rule (the "CPS Rule") as well as EPA's decision to revert back to its traditional and Congressionally mandated approach of making a significant contribution finding under Section 111 of the Clean Air Act for each pollutant it seeks to regulate. As detailed below, Westmoreland believes that these decisions are also further bolstered by the limits placed by Congress on EPA actions under 111(d), and by the major questions doctrine, which would be implicated if EPA were to attempt to regulate GHG emissions from powerplants under section 111(d).

In summary, the CPS Rule should be rescinded for all of the following independent reasons:

1. The CPS Rule unlawfully imposed emission standards for GHGs under section 111 without first making a requisite endangerment finding under section 111;
2. GHG emissions from fossil fuel fired EGUs do not constitute a significant contribution to dangerous air pollution;
3. The CPS Rule's CCS BSER was unlawful because it cannot be implemented at an existing source or even within a source's fenceline;
4. The CPS Rule's short-term co-firing BSER is unlawful because it was an impermissible mandate to shift generation away from coal, in violation of the Supreme Court's determination that EPA lacked such authority under section 111(d);
5. The CPS Rule's CCS BSER was unlawful and arbitrary, because it was factually unsupported and not demonstrated to be achievable anywhere, let alone on an industrywide basis;
6. The CPS Rule's co-firing BSER was arbitrary because it was not factually supported or demonstrated to be achievable on an industrywide basis;

[1] Talen Montana Comments on CPS Rule, EPA-HQ-OAR-2018-0794-5987, p.6.
[2] See Barkey Report, detailed below and attached.

7. The CPS Rule's BSER determinations were based on many arbitrary and fatally flawed rationales, and arbitrarily departed from the EPA's historic practices and determinations without reasoned explanation;
8. The CPS Rule did not lawfully consider costs, because its cost analysis was inadequate, unlawful, and arbitrary, including by unlawfully relying on tax credits and pollutant co-reductions and on arbitrary social cost of carbon estimates;
9. EPA is prohibited from regulating existing fossil fuel fired power plants under section 111(d), because that source category is already regulated under section 112.
10. The CPS Rule's BSER determinations violated the Major Questions Doctrine in multiple ways, including doing each of the following without any clear congressional delegation: regulating GHGs under section 111 (and especially under 111(d)); imposing BSER based on astronomically expensive and speculative measures that are not able to be satisfied at the source within its fenceline; mandating (directly and indirectly) a generation shift away from coal; and regulating existing fossil fuel powerplants under section 111(d) despite that source category being regulated under section 112.

## I. By Its Plain Terms, Section 111 Requires A Pollutant-Specific Endangerment Finding.

The CPS Rule relied on the premise that finding a threat to public health from emissions of ***one*** pollutant from a source category gives the Agency authority to regulate ***any*** substance emitted from that same source category. 80 Fed. Reg. at 64529–30. As EPA itself has now largely acknowledged, this interpretation is infirm and cannot be squared with the statute.

### a. EPA's Proposed Interpretation Squares with the Section 111's Text

EPA's currently proposed interpretation of Section 111 is the "best" reading of Section 111 that is tied to clear congressional approval: a significant contribution finding must be made for each pollutant before EPA has statutory authority to regulate them under section 111 of the Clean Air Act (CAA). And in a post-*Loper Bright* and post-*West Virginia* era of statutory interpretation, only the "best" interpretation tied to "clear congressional intent" should be implemented by the agency.

Section 111 authorizes EPA to issue a standard of performance—defined as a "standard for emissions of air pollutants"—for a source category.[3] But it may do so only after EPA finds that a source category "causes" or "significantly contributes" to air pollution that endangers health or welfare.[4] So, the only way the text allows this determination and creation of a standard for performance for the source category is to consider whether each of a source category's individual pollutants significantly contribute to pollution. No other barometer exists to make such an assessment. The best and only logical inference from the text then is that the "standard

[3] 42 U.S.C. §§ 7411(a)(1), (b)(1)(B).
[4] *Id*. §§ 7411(b)(1)(A), (B).

for emissions of *air pollutants*" arises to address the pollutants that significantly contribute to pollution affecting health and safety.

Any other interpretation uncouples the pollutant that caused the need for the standard of performance from the standard of performance itself. If uncoupled, EPA's regulatory authority becomes untethered from any materially limiting principle. It could impose costly regulations on any air pollutant from a source category under section 111 regardless of the immateriality of such emissions, or whether those emissions were actually causing harm to public health or the environment. Following this invalid interpretation to its extreme, EPA could even regulate every pollutant from a source category except for the pollutant that significantly contributes to pollution.

These absurd outcomes would collide with *West Virginia v. EPA*'s holding. *West Virginia v. EPA*, 597 U.S. 697 (2022), addressed the Obama administration's previous attempt to restructure the nation's power grid by requiring generation shifting away from coal through Section 111. The Supreme Court concluded that using the "previously little-used backwater" of Section 111(d) to do so could not be squared with the major questions doctrine, which demands that agency interpretations that have a major economic or political impact must be grounded in a clear congressional delegation.[5] Yet the CPS Rule again sought to shoehorn an economically significant regulation, on the politically significant question of how to regulate GHG emissions and structure of the nation's energy generation, through the exact same regulatory provision. And, again, nothing in Section 111's text whispers, let alone reveals, a clear congressional intent to hand EPA broad authority to (1) regulate pollutants from an industry for which the agency has not made a pollutant specific endangerment finding; (2) regulate GHGs from existing sources; or (3) regulate any pollutants from source categories, including powerplants, that are already regulated under section 112 (see *infra* for more detail on that point). The current proposed rule avoids these landmines by appropriately declining to fiat such major policy and economic questions in the absence of clear congressional authorization.

Nor do blanket references to "pollutants" in section 111 necessarily include GHGs at all, nor is it required even if GHGs fit within the Act-wide definition of an "air pollutant" because the Supreme Court has noted that EPA interpretations may look to the "statutory context" to conclude "that a generic reference to air pollutants does not encompass every substance falling within the Act-wide definition," including in the specific context of section 111 NSPS standards, concluding that references to "any air pollutant" in section 111 are "limited to air pollutants *for which EPA has promulgated new source performance standards*. "[6]

The recent holding in *Loper Bright* shares kinship with *West Virginia v. EPA*. *Loper Bright*, 603 U.S. 369 (2024), requires the "best" interpretation and in doing so eliminated agency deference on statutory interpretation questions. *Loper Bright* and *West Virginia* together create a stalwart against agency overreach—to take sweeping new regulatory action against an industry, an agency must be able to clearly articulate the best interpretation of the statute, which must clearly reveal Congress's express delegation of such authority in the text of the relevant statute.

[5] *Id.*, at 730.
[6] *Util. Air Regulatory Grp. v. EPA ("UARG")*, 573 U.S. 302, 317 (2014) (emphasis in the original).

EPA should finalize the proposed rule, because it respects the limits of authority clearly delegated to EPA, and adopts the best interpretation within those constraints—*i.e.* a significant contribution finding must be made for each pollutant from each source category prior to regulating it under section 111.

### b. EPA's Interpretation Follows the Statutory Structure

EPA's interpretation matches with the structure of section 111 and the Clean Air Act more broadly. The CAA's structure repeats the need for EPA to make significant contribution findings about certain pollutants *before* regulating those pollutants.[7] The repetition further emphasizes that Congress constrained EPA regulation by requiring a finding per pollutant.

Moreover, the Supreme Court has clarified that the CAA's structure demands that "air pollutant" must be given "reasonable, context-appropriate" interpretations.[8] The proposed rule does just that. It seeks to contextualize the breadth of EPA's power to regulate a source category only after a finding of significant contribution. The clear answer: the breadth of power needed to address the source—a specific pollutant—of the significant contribution. No other interpretation would properly consider the context. *Utility Air* deemed it "plain as day that the Act does not envision an elaborate, burdensome permitting process for major emitters of steam, oxygen, or other harmless airborne substances," *id.*, which is exactly what the CPS Rule's interpretation of Section 111 would have allowed if pollutants can be regulated without any endangerment finding.

And *Utility Air* listed examples that further support this interpretation. For one, the CAA requires a permit for a source in a nonattainment area "with the potential to emit 100 tons per year of 'any air pollutant,'" which is "limited to pollutants for which the area is designated nonattainment."[9] Additionally, when Section 111(b) authorizes performance standards if a source "increases its emission 'of any air pollutant,'" the term is "limited to air pollutants for which EPA has promulgated new source performance standards."[10] The proposed rule properly takes the same approach, by making clear that a rule under Section 111 must address the ***same*** "air pollutants" that EPA has found endanger public health or welfare under section 111.

The legislative history supports the current rule, too. When EPA recently reviewed the legislative history, it found "evidence that Congress, in fact, intended to require the EPA (or, indeed, understood that the EPA had always been required), in promulgating a pollutant-specific [performance standard] under CAA section 111, to make a pollutant-specific finding."[11] The House Conference Report for the 1977 amendments to the CAA—which overhauled many of the Act's endangerment finding provisions—states that an endangerment finding is required under a variety of provisions, including Section 111, before EPA can "regulate any air pollutant from those sources, the emissions of which . . . cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare."[12] EPA's current interpretation is

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[7] *See, e.g.*, 42 U.S.C. §§ 7408(a)(1), 7415(a), 7521(a)(1), 7545(c)(1), 7571(a)(2).
[8] *UARG*, 573 U.S. at 317.
[9] *Id.* at 317-18.
[10] *Id.* at 317.
[11] 84 Fed. Reg. at 50264-65.
[12] H.R. Rep. No. 95-564 at 183–84 (1977); *see also* H.R. Rep. No. 94-1175 at 33 (1976).

thus now consistent with the text and structure of the Act, as well as legislative intent relevant to understanding that text and structure.

### c. The Proposed Rule Conforms with EPA's Past Practice and Court Decisions

Not only is the proposed rule consistent with EPA's statutory authority, but EPA's interpretation in the Proposed Rule comports with decades of EPA's prior conduct, and court decisions that were informed by that conduct. The lone exceptions in terms of agency conduct arose during the Obama and Biden Administrations. It is an axiom that agency action must be reasoned, and "reasoned decision making... necessarily requires the agency to acknowledge and provide an adequate explanation for its departure from established precedent."[13] But the CPS Rule failed to do so, not articulating a statutory basis for regulating without any endangerment finding under section 111(d). It also failed to even acknowledge its break with past practice. "An agency may not... depart from a prior policy *sub silentio*," which is nothing more than providing no explanation at all.[14] So, the proposed rule simply seeks to course correct, reverting to EPA's decades-long conduct.

Just after Congress adopted Section 111, EPA interpreted it to require a pollutant-specific finding.

> The Administrator first considers potential ***health and welfare effects of a designated pollutant*** in connection with the establishment of standards of performance for new sources of that pollutant under section 111(b) of the Act. Before such standards may be established, the Administrator ***must find that the pollutant in question*** ''may contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare'' [see section 111(b)(1)(A)]. Because this finding is, in effect, a prerequisite to the same pollutant being identified as a designated pollutant under section 111(d), ***all designated pollutants will have been found to have potential adverse effects on public health, public welfare, or both.***[15]

EPA recently admitted the agency "in the past did... require a pollutant-specific" finding. *Id* at 50266.

With the one exception of the Obama Administration's CPP, which was repudiated by *West Virginia* on other grounds, EPA remained consistent with this practice until the Biden Administration's CPS Rule. As even the Obama era Administration acknowledged, "for the most part, [EPA's] past practice has been to list a source category and to propose NSPS for pollutants from the source category at the same time as, or shortly after the listing," and, "under those circumstances, EPA could be considered to have made... endangerment findings for those pollutants."[16] EPA made this explicit in one of the 1970s-era source category listings EPA relies on for authority in the CPS Rule itself: When EPA listed stationary gas turbines as a category, it

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[13] *Jicarilla Apache Nation v. Dep't of Interior*, 613 F.3d 1112, 1119 (D.C. Cir. 2010) (marks omitted).
[14] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009).
[15] EPA-450/2-77-005 (March 1977) at 2-1; *see also* 84 Fed. Reg. 50244, at 50266 n.77 (Sept. 24, 2019) (citing guidance in accord with this interpretation).
[16] 84 Fed. Reg. at 50266.

relied on the simultaneous promulgation of pollutant-specific performance standards for the category as the "basis for" its endangerment finding.[17]

Prior decisions of the D.C. Circuit also align with the current proposed rule. For instance, *National Asphalt Pavement Association*, 539 F.2d 775, 783 (D.C. Cir. 1976), states that Section 111 "obviously contemplates an evaluation of whether certain types of air pollution endanger the public health and whether the source category contributes significantly to that air pollution." And *Northeast Maryland Waste Disposal Authority v. EPA*, 358 F.3d 936, 939 (D.C. Cir. 2004), states Section 111 "requires EPA to develop emission standards generally for each category of pollutant EPA determines 'causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.'" In *National Asphalt*, petitioners complained that EPA listed a source category without notice and comment.[18] But the D.C. Circuit rejected the challenge, explaining that EPA had "concluded that the asphalt concrete industry was a 'significant contributor' of particulate matter air pollution" when it issued the accompanying standard of performance and that petitioners had the opportunity to comment in that proceeding. *Id.*

Nor did the decision in *American Lung Association v. Environmental Protection Agency*, No. 19-1140 (D.C. Cir. 2021) determine otherwise. That decision assumed for the sake of argument, without deciding, that section 111 requires a source specific and pollutant specific endangerment finding, but rejected coal petitioners argument in that case that the endangerment finding had not been satisfied with respect to the ACE rule, based on the court's conclusion that the EPA in the ACE rule had relied on an endangerment finding imbedded in the 2015 NSPS standards first regulating GHGs from the source category. The court excused the lack of detailed finding in that rule regarding whether emissions from the source category significantly contributed to GHG emissions associated with the asserted health impacts, claiming that EPA need only articulate a rational basis for regulating emissions from that category. Notably, although this opinion was later overturned on different grounds (major questions doctrine, in *West Virginia v. EPA*), the court still maintained its dismissal of the endangerment finding argument in its Amended Judgement in response to Supreme Court Order, *American Lung Association et al. v. EPA*, No. 19-1140 (D.C. Cir. Oct. 27, 2022) (ordering that Coal Petitioners' petitions for review of the ACE Rule be denied). That Court was wrong to claim that a "rational basis" for regulating GHG emissions from a source category could substitute for the statutorily mandated determination that the source category section "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare" 111(b)(1)(A). And the court's conclusion that the 2015 NSPS rationale was a "reasonable basis" (i.e., that power plants emit more GHGs than any other source category in the US) suffers from the fundamental arbitrary and unexplained assumption that there is a source category that "causes, or contributes significantly" to the climate change impacts used as the basis for concluding that GHGs are associated with public health impacts. *I.e.*, just because a source category is significant *relative to other categories* says nothing about whether the source category's contribution is significant *with respect to the emissions and health impacts at issue,* which is the statutory test. And this issue has not been reviewed by the Supreme Court, since the Supreme Court reversed this D.C. Circuit panel on other grounds (major questions doctrine) and

[17] 42 Fed. Reg. 53657; *see also* 42 Fed. Reg. 53782.
[18] *Id*., at 785.

did not review the endangerment finding aspect of the decision. In any case, regardless of its validity, this D.C. Circuit decision should not hinder the Proposed Rule for the following additional reasons:

1. The D.C. Circuit's upholding of the ACE Rule (based on its reliance on the 2015 NSPS discussion on the so called significance of power plant GHG contributions) does not save the CPS Rule, because the CPS rule, unlike the ACE rule, did not actually rely on the 2015 analysis, instead claiming the endangerment finding was satisfied solely based on 2009 (automobile) and 2016 (aircraft) endangerment findings, neither of which had anything to do with powerplants, nor even purported to make a source category specific contribution finding with respect to powerplants.[19]

2. The D.C. Circuit's decision on the endangerment finding did not account for major questions implications (since it fundamentally misunderstood that doctrine, and was reversed by the Supreme Court on that basis), and thus the D.C. Circuit opinion never addressed the question of whether imposing major economic costs on emissions from a source category without having made a significant contribution finding with respect to the specific source category and pollutant would violate the major questions doctrine due to lack of clear congressional authorization.

3. Because the D.C. Circuit's decision was based on deferring to EPA's determinations on significance of source contributions so long as it is reasonable, the decision does not stop EPA from now changing to a different, reasonable, interpretation of significance of source category contributions, as the Proposed Rule proposes to do, and as is addressed further in section II of these comments, infra.

## II. EPA's Endangerment Finding is reasonable, but should define Significant Contribution in Relation to the Alleged Global Climate Change Impacts

Although policy priorities can be a valid input into an agency determination of discretionary significance, EPA should not rely solely on that basis, because policy preferences are more capable of change over time, and industry needs more long term predictability to drive investment and capital decisions.

Accordingly, although it is reasonable for EPA to account for the current administration's policy objectives, EPA should also as an independent alternative justification rely on an alternative interpretation of significance that is independent of the administration's policy objectives. As detailed below, even apart from any consideration of policy preferences, the best interpretation of significance still supports a determination that GHG emissions from coal fired power plants do not significantly contribute to endangerment of human health and the environment.

A "significant contribution" to pollution must be relative to the overall problem a pollutant allegedly creates. "Significant" means "having or likely to have influence or

[19] *See* CPS Rule at 39807-08.

effect: important."[20] And "important" means being "valuable in content or relationship."[21] While "contribution" means "the giving or supplying of something (such as money or time) as a part or share."[22] In essence, a significant contribution in the context of Section 111 is the supply of an air pollutant that has an important effect on the total share of that air pollutant and its associated adverse impacts. The share, of course, must be measured appropriately—in the context of the alleged problem it contributes to.

For GHGs, global impact—not localized impact—is the concern. The concerns from climate change are driven by global emissions (in stark contrast to other pollutants, where local emissions are able to be significant with respect to local impacts). Thus it would be reasonable to measure a source category's $CO_2$ emissions against global emissions. In 2023, the total global $CO_2$ emissions were 37.4 billion metric tons.[23] The entire U.S. coal industry's contribution was 709 million metric tons.[24] If the entire U.S. coal-fired EGU sector ceased to exist, only a 1.8% reduction in $CO_2$ emissions would occur.

The question is, then, whether an 1.8% contribution is significant. On a question of fact (unlike a statutory interpretation issue), an agency still receives a measure of deference under an arbitrary and capricious review. A determination that such a small percentage of an overall concern is not significant would be reasonable.

Moreover, whatever threshold counts as significant, it cannot include amounts that are so insignificant as to be de-minimis, i.e., amounts that cannot be said to affect the outcome of the predicted harms, based on objective data. According to the United Nations, a 43% reduction of $CO_2$ is necessary by 2030 to limit the rise in temperature by the turn of the century to 1.5 degree Celsius.[25] Accordingly, even under the data and information relied on by the prior administrations that implemented the CPS, and its precursor (the CPP, and the GHG NSPS), the data supports a finding that contributions from fossil fuel fired powerplants are de-minimis, since they are below the threshold that affects the adverse effects postulated from GHGs.

Some activists are likely to object that this is too stringent a test because there are no industrial source categories in the United States that emit at levels that are significant in terms of contribution to global climate change. But such an objection would only prove the larger point: the current laws as passed by Congress today do not clearly authorize GHG regulation under section 111. It is a question of major political, social, legal, and economic significance how to regulate and impose curtailments and related costs on emissions of GHGs from vastly different and wide-ranging natural, industrial, and non-industrial sources, all of which are de-minimis when considered individually or in terms of industrial categories (the only relevant metrics currently allowed under the CAA in general, and section 111 in particular). Accordingly, it is

[20] "Significant," Merriam Webster Dictionary, https://www.merriam-webster.com/dictionary/significant
[21] "Important," Merriam Webster Dictionary, https://www.merriam-webster.com/dictionary/important
[22] "Contribution," Merriam Webster Dictionary. https://www.merriam-webster.com/dictionary/contribution
[23] International Energy Agency, $CO_2$ Emissions 2023, https://www.iea.org/reports/co2-emissions-in-2023/executive-summary (last visited July 30, 2025).
[24] U.S. Energy Information Administration, How much carbon dioxide is produced per kilowatthour of U.S. electricity generation?, https://www.eia.gov/tools/faqs/faq.php?id=74&t=11 (last visited July 30, 2025).
[25] United Nations Framework Convention on Climate Change, Climate Plans Remain Insufficient: More Ambitious Action Needed No, https://unfccc.int/news/climate-plans-remain-insufficient-more-ambitious-action-needed-now (Oct. 26, 2022).

proper for EPA to await guidance from Congress in the form of a clear statutory resolution of the policy issues involved and applicable legal framework, before attempting to pull such an elephant from the mousehole of section 111.

## III. EPA Rightly Rescinds the CCS Requirements of the CPS Rule

EPA rightly proposes to rescind the CPS Rule's fatally flawed determination that 90% CCS is BSER for coal fired power plants. Although the industry has voluntarily continued to explore the extent to which CCS may be possible in the future at some facilities in particularly favorable conditions, the CPS Rule's fiat of 90% CCS on an industrywide basis flew in the fact of law and fact and EPA is right to no longer defend such an unsupportable standard.

As explained in the Proposed Rule, and in more detail below, CCS categorically cannot constitute BSER under Section 111(d) because it is not applicable at the source, and because it is not widely achievable in practice industrywide as a factual matter, which was underscored by the fact that the CPS Rule had not identified a single coal fired power plant in the world with retrofit CCS controls that had consistently demonstrated achievability of EPA's proposed capture efficiency on a continuous and consistent basis.

### a. CCS Categorically Cannot be BSER under Section 111 Because it Requires Implementation Outside the Source's Fenceline, Rather than at the Source.

Emission standards under section 111 of the Clean Air Act must "reflect[] the degree of emission limitation achievable through the application of the best system of emission reduction [BSER] which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[26]

The text, structure, and context of section 111 require that the "system" of emissions reductions considered by EPA be measures implemented at the source level, i.e., inside a source's fenceline. Specifically, as EPA itself explained in the ACE rule that the Supreme Court upheld in *West Virginia v. EPA*, "the text and reasonable inferences from it give a clear answer: 'system' . . . is limited to measures that can be applied to and at the level of the individual source."[27] The proper scope of a "best system of emission reduction," like all other statutory requirements, must be interpreted by reading its "words in their context and with a view to their place in the overall statutory scheme."[28] Section 111(a)(1)'s "standard of performance" definition applies to Sections 111(b)(new sources) and (d)(existing sources) alike, so its construction must make sense of both provisions. Section 111(a)(1) defines "standards of performance"—set by EPA under subsection (b) and by States under subsection (d). This interplay makes Sections 111(a)(1), (b), and (d) "interlocking language and structure" which must be interpreted in reference to each other and how they are intended to operate in practice.[29]

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[26] 42 U.S.C. § 7411(a)(1).
[27] *See* ACE Rule, 84 Fed. Reg. at 32527-29 (EPA–HQ–OAR–2017–0355) (July 8, 2019).
[28] *King v. Burwell*, 576 U.S. 473, at 486 (2015) (cleaned up).
[29] *Territory of Guam v. United States*, 141 S. Ct. 1608, 1613 (2021); *see also Cyan, Inc. v. Beaver Cnty. Emps. Ret. Fund*, 138 S. Ct. 1061, 1071 (2018) (courts routinely interpret definitions along with their statute's operative provisions); *Lawson v. Suwannee Fruit & S.S. Co*., 336 U.S. 198, 200-01 (1949) (same, when "mechanical"

Starting with "source," Section 111 makes plain that standards of performance are individual targets, which in turn makes it implausible to interpret "best system" (an essential input to those standards) apart from anything a particular source could achieve. Consistent with EPA's national mandate, Section 111(b) directs the agency to list categories of "sources" and issue performance standards for the "new sources" within each category.[30] In contrast, Section 111(d) starts and ends with "source" in the singular: States establish standards "for any existing source," and may consider factors specific to "the existing source" when applying them.[31] Congress' choice of singular and plural carries weight and thus "standard of performance" must be interpreted in a way that works with both.[32] Notably, unlike their deliberate use of source and sources, neither Section 111(b) nor (d) refers to a source "owner or operator." Section 111 regulates the "source," *id.* § 7411(b), (d)(1), and an owner violates the statute by operating "*such source* in violation of any standard of performance *applicable to such source*," *id.* § 7411(e) (emphases added). Section 111 also describes standards "for" an existing source.[33] Furthermore, Section 111(a)(1) defines a standard of "performance." And "Performance" implies action, i.e. what a stationary source does.[34] Focusing on action also makes sense of Section 111's "prohibited act[]" of "operat[ing]" a source contrary to a performance standard.[35] This interpretation is also consistent with the CAA's general definitions.[36] Finally, the performance standard must be "for" an "existing" source, not for a new set of sources on and off-site as would be required to implement CCS, given the "sizeable physical footprint and a consequent land-use requirement"[37] EPA recognized would be required for new $CO_2$ capture and compression facilities, let alone transportation, and sequestration sources.

EPA is thus limited under Section 111(d) to regulating within the fenceline of a facility through reductions that can be implemented on-site. But CCS requires offsite implementation through pipelines and sequestration wells or formations. It is impossible to apply the standard at the source itself, because even installation of carbon capture at the source does not comply with the standard, absent other speculative offsite developments not under control of the source. Implementing CCS would require power plants to obtain new property rights, construct new pipelines, and construct and operate a new facility in a different location, or else the powerplant would be required to be held hostage by relying on third parties for compliance (common pipeline carrier and Class VI well operator), if even feasible or available. Yet the CPS Rule required virtually every existing coal fired EGU to construct pipelines to one extent or another. In fact, EPA acknowledged that about 23% of coal fired plants are over 80 km away from sequestration options, and 10 percent are over 100 km away in the proposed CPS Rule and did nothing to address it in the final CPS rule.[38] And the final CPS rule further confused the issue

constructions of a definition would create "incongruities" in how the statute operates).

[30] 42 U.S. Code § 7411(b)(1).

[31] *Id.* § 7411(d)(1).

[32] *Niz-Chavez v. Garland*, 141 S. Ct. 1474, 1482 (2021).

[33] 42 U.S. Code § 7411(b)(1)(B), (d)(1).

[34] WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1678 (1968) ("act or process of carrying out something"; "execution of an action")

[35] 42 U.S. Code § 7411(e).

[36] *See id.* § 7602(l) (defining "standard of performance" to include "any requirement relating to the operation or maintenance *of a source* to assure continuous emission reduction") (emphases added); *see also* § 7602(k) (similar for "emission limitation").

[37] CPS Final Rule at 39886.

[38] CPS Proposed Rule at 33347 (EPA-HQ-OAR-2023-0072)

with arbitrary rationale, noting that 98% of coal-fired plants are within 1 mile of land upon which a carbon capture *system*—not a location to sequester carbon underground—could be located.[39] Such pipeline and sequestration requirements threaten the continued operation of each facility because this new offsite infrastructure requires rights of way and permitting (whether done by the facility or by a third party), and neither rights of way nor permitting can be guaranteed, especially for such a distance. Accordingly, because CCS is not a control that can be implemented on-site, it cannot lawfully be treated as BSER under section 111.

Independently, the CPS Rule's selection of CCS as BSER was arbitrarily inconsistent with EPA's assertion at the time that the CPS Rule was intended to be consistent with historic section 111 BSER determinations. Because all prior controls required under section 111 either reduce the amount of pollutants produced by a process (e.g. good combustion practices, coal washing) or actually control emissions onsite (as opposed to merely capturing emissions for offsite disposal somewhere), the CPS Rule's representation that the controls required were intended to be consistent with regulatory history under section 111 ran afoul of the Supreme Court's holding that it is arbitrary to change regulations without even acknowledging that the practice or policy has in fact changed.[40]

Moreover, the CPS Rule's departure from this fenceline limitation violated the major questions doctrine, because there is no clear statement in section 111(d) to select a BSER based on measures that cannot be implemented at the source. In *West Virginia v. EPA*, the Supreme Court struck down a regulation that would have defined BSER as a $CO_2$ emission limit too low to achieve except by shutting down certain coal fired EGUs and generation shifting, holding that "Capping carbon dioxide emissions at a level that will force a nationwide transition away from the use of coal to generate electricity may be a sensible 'solution to the crisis of the day.' But it is not plausible that Congress gave EPA the authority to adopt on its own such a regulatory scheme in Section 111(d). A decision of such magnitude and consequence rests with Congress itself, or an agency acting pursuant to a clear delegation from that representative body."[41] In that case, the Supreme Court did not expressly reach the question of whether "'system of emission reduction' refers exclusively to measures that improve the pollution performance of individual sources, such that all other actions are ineligible to qualify as the BSER" but expressly noted that "EPA has acted consistent with such a limitation for the first four decades of the statute's existence."[42]

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[39] CPS Final Rule at 39886.

[40] *FCC v. Fox Television Stations, Inc*., 556 U.S. 502 (2009) ("the requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it is changing position. An agency may not, for example, depart from a prior policy sub silentio"). Before the Clean Power Plan which the Supreme Court found to be unlawful in *West Virginia v. EPA*, EPA issued only seven Section 111(d) regulations in over 40 years. These rules concerned four localized pollutants from five source categories, *see e.g*. 79 Fed. Reg. 34,830, 34,844 (June 18, 2014) (listing historic regulations), and none was directed toward ubiquitous pollutants like carbon that had not been subjected to an endangerment finding under section 111. Nor did EPA try to use Section 111(d) to regulate activities beyond a specific source's fenceline. The closest it came was one rule issued under multiple CAA provisions outside of section 111 and another that succumbed to a court challenge on other grounds— both allowed trading as a compliance mechanism but grounded the substantive standards in what individual sources could achieve. 60 Fed. Reg. 65,387, 65,402 (Dec. 19, 1995); 70 Fed. Reg. 28,606, 28,616 (May 18, 2005), rule vacated by *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008).

[41] 142 S. Ct. 2587 (2022) (internal citations omitted).

[42] *Id.* at 2614.

While the Supreme Court did not proceed to provide an express holding on that question since it already had resolved the legality of the rule on major questions grounds, the previous four decades approvingly noted in the Supreme Court's decision do in fact reflect the best reading of Section 111[43]—emission control measures that cannot be implemented at the source (*i.e.*, within the source's fenceline) are not BSER. As previously explained above, the text, structure, and context of section 111 require that the "system" of emissions reductions considered by EPA be measures implemented at the source level, i controlling a stationary source by way of a system of emissions reductions that applies at the stationary source (within its fenceline) and not based on a detached or spatially limitless relationship. EPA's four decades of supporting practice merely serves to underline that this is in fact the best interpretation of the text, and even more so to show that there certainly is not a clear congressional authorization, as would be required by the major questions doctrine, to go beyond the source's fenceline to establish BSER.

Regardless, departure from this fenceline limitation without providing a rationale for the reversal was also arbitrary.[44] Indeed, the CPS Rule failed to even acknowledge that it was abandoning the EPA's long practice of limiting BSER to measures that can be implemented at the source within the fenceline, instead claiming that in Section 111(d) actions generally, "EPA has determined the BSER to be 'measures that improve the pollution performance of individual sources,'" and EPA represented that the CPS Rule was intended to be consistent with this "regulatory history."[45]

Making compliance dependent on outside the fenceline measures independently rendered the BSER unachievable in practice for much of the industry, because the CPS Rule would require virtually every existing coal fired EGU to construct pipelines to one extent or another. Such pipeline and sequestration requirements threaten the continued operation of each facility because this new offsite infrastructure requires rights of way and permitting (whether done by the facility or by a third party), and neither rights of way nor permitting can be guaranteed, especially for such a distance. And every landowner along the route would have the ability to threaten at least temporary closure of the facility by refusing to sell rights of way effectively preventing construction of the infrastructure needed to comply with the CPS Rule, thus providing incentive for holdouts and driving up the cost of such property right acquisitions far above the historic levels EPA relied on for its cost estimates. As such, the CPS Rule did not adequately contemplate the cost, timing, and cooperation of landowners in obtaining up to or exceeding 100 km for a route for either pipeline or rail infrastructure for every existing coal fired facility. And even where government programs have increased funding, they have not suspended or otherwise alleviated permitting requirements for such extensive new pipelines. Notably, should an Environmental Assessment or Environmental Impact Statement be necessary (as are often required due to state laws regarding power plant infrastructure siting, among other triggers for EA and EIS studies), that cost, time for completion, and results of the EA or EIS may further adversely impact, or disallow such construction. Such permitting and related engineering and construction take extensive time (i.e. several years) and often face community opposition,

[43] *Loper Bright*, 603 U.S. at 400.
[44] *FCC v. Fox Television Stations, Inc*., 556 U.S. 502 (2009) ("An agency may not . . . depart from a prior policy sub silentio").
[45] CPS Proposed Rule at 33243 (EPA-HQ-OAR-2023-0072).

meaning that there is no guarantee a source will be able to comply even for companies dedicated to doing so, because unlike options historically considered as BSER under section 111(d), construction of offsite transportation pipelines and sequestration facilities are not options that can be implemented on property and machinery owned by the company, but depends on the acquiescence of many third party individuals, communities, and government bodies, thus threatening temporary or permanent shutdowns if/when it cannot be enacted in a timely manner, since the CPS Rule does not exempt facilities that are not able to connect to or obtain rights and permits for required CCS infrastructure. The potential that authorization will be denied either by the permitting authority or due to later community opposition and legal challenges is significant and par-for-the course for pipeline projects, whether $CO_2$ or otherwise. [46] Subjecting the continued viability of much of the US electric grid to these eventualities was not rational or supportable, and in any case was arbitrary and capricious due to the CPS Rule's glaring failure to consider this significant aspect of the problem. And even when approvable, pipeline projects historically take many years of development for the pipeline alone (let alone for new sequestration facilities), which would make it impossible to know in advance whether CCS could be installed by the regulatory deadline. This is especially relevant because capital allocations have to be made in advance which will push industry to shift away from coal toward anything that does not require CCS given the uncertainties attending the development of CCS transportation and sequestration infrastructure.

[46] For example: North Dakota's denial of Summit Carbon Solution's permit for a $CO_2$ pipeline August of 2023, and Sierra Club's subsequent vow to use the decision to block $CO_2$ pipelines elsewhere throughout the US (*see e.g*., https://www.reuters.com/sustainability/climate-energy/north-dakota-regulator-rejects-summit-carbon-solutionscarbon-pipeline-2023-08-04/); Navigator $CO_2$ Ventures' failure as of January of this year to obtain land rights to construct their planned heartland Greenway $CO_2$ pipeline in Illinois due to residents refusal to give up land rights due to opposition to $CO_2$ pipeline, leading to withdrawal of permit application, and resubmittal of different plan (*see e.g.,* https://www.reuters.com/world/us/us-carbon-pipeline-faces-setback-residents-refuse-cede-land-rights-2023-03- 09/); the opposition to the Navigator $CO_2$ Ventures and Summit Carbon Solutions pipelines including multiple Iowa counties passing ordinances hindering $CO_2$ pipeline development, over 100 pending lawsuits in South Dakota alone related to the pipeline proposals, and a judicial order striking down as unconstitutional a state law allowing even just property access for pipeline companies to survey private land for potential pipeline development (*see e.g.,* https://minnesotareformer.com/2023/05/12/landowner-battles-against-pipelines-vary-by-state/); the decisions in July of 2023 by the Fourth Circuit to block work on the Mountain Valley Pipeline due to renewed litigation challenges from environmental groups (notwithstanding Congress' own intervention as part of the June 2023 debt ceiling bill that included provisions expressly aimed at authorizing that pipeline and stripping the Fourth Circuit of jurisdiction) and which were only lifted due to emergency order by the Supreme Court, and are still subject to further litigation in the D.C. Circuit (*Mountain Valley Pipeline, LLC, v. The Wilderness Society, et al*., No. 23A35 (U.S., application to vacate granted Jul 27 2023)); President Biden's revocation of the Keystone pipeline permit by executive order in 2021, ending planning ongoing since 2008 (*see e.g*., https://apnews.com/general-news-2fbcce48372f5c29c3ae6f6f93907a6d); the 2020 cancelations of the billion dollar Constitution pipeline after 8 years of being held up in litigation, the Northeast Supply Enhancement pipeline due to inability to obtain a water permit from the state agency, the $8 billion Atlantic Coast Pipeline due to legal obstacles even after winning a Supreme Court decision upholding one of its permits in *U.S. Forest Serv. v. Cowpasture River Preservation Ass'n*., 140 S. Ct. 1837 (2020), and the Dakota Access Pipeline shutdown due to a district judge's determination that the project had not first performed a proper EIS, despite the US Army Corps having determined and represented to the pipeline's owner that an EIS wasn't necessary (*see e.g*., https://www.forbes.com/sites/scottcarpenter/2020/07/06/oil-and-gaspipelines-increasingly-losing-legal-challenges/?sh=243ad9721e88); The Supreme Court of Texas' decision that a Denbury $CO_2$ pipeline was not entitled to use eminent domain to obtain rights to lay such pipelines under state law (*Texas Rice Land Partners, Ltd. v. Denbury Green Pipeline-Texas, LLC*, 363 S.W.3d 192 (Tex. 2012)).

### b. The 90% Control via CCS Standard Was Unlawful and Factually Unsupported Because it Has Never Been Demonstrated to Be Achievable Anywhere, Much Less on an Industrywide Basis.

Before diving into the so called examples and support relied on by the CPS, it is important to note that the CPS Rule's entire approach to demonstrating achievability was fundamentally flawed. What matters is not whether a standard has ever been achieved (though that should certainly be a basic necessary condition), but rather that the standard is widely achievable across the source category. The core requirement of CAA section 111 is that any emission standards must be "achievable," and EPA is only permitted to set BSER under section 111 based on emission reduction options that are "adequately demonstrated."[47] Furthermore, court decisions have further explained that in considering the availability of different systems of emission reduction, the "EPA must examine the effects of technology on the grand scale," because CAA section 111 standards are "a national standard with long-term effects."[48] To that end the EPA must "consider the representativeness for the industry as a whole of the tested plants on which it relies . . . ."[49] And a standard of performance must be achievable by the industry as a whole and must present the "least common denominator" that can be achieved by a source anywhere in the country, *id.* at 431, and the record must "support the 'achievability' of the promulgated standards for the industry as a whole," *id*.

The CPS Rule's focus on a couple of cherrypicked examples of limited CCS demonstrations missed the forest for the trees, arbitrarily ignoring the relevant fact that the vast majority of CCS projects have failed. A recent study published in 2020 concluded that more than 80 percent of the 39 CCS projects attempted in the U.S. have ended in failure.[50] Likewise a report by the Institute for Energy Economics and Financial Analysis (IEEFA) concludes that after a half-century of research and development, of the 13 flagship cases worldwide generally touted as demonstrating CCS, ten (comprising 90% of the total capture capacity of the 13 facilities) either completely failed or are underperforming, mostly by large margins.[51]

But not even the cherrypicked examples relied on in the CPS Rule supported the BSER it selected. EPA only identified three[52] existing coal fired facilities (Boundary Dam, Petra Nova, and Plant Barry) that have actually implemented retrofit CCS that EPA claimed was even close to 90% capture. But even the CPS Rule expressly acknowledged that at the two facilities with the largest demonstrated capture capacities (Boundary Dam and Petra Nova), continuous operation of the CCS system had not been possible, was accompanied by a host of operational issues

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[47] 42 U.S. Code § 7411(a)(1).
[48] *See Portland Cement v. Ruckelshaus*, 486 F.2d 375, 391 (D.C. Cir. 1973)
[49] *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 432-33 (D.C. Cir. 1980).
[50] Ahmed Abdulla et al, "Explaining successful and failed investments in U.S. carbon capture and storage using empirical and expert assessments," *Environmental Research Letters*, Volume 16, Number 1 (Dec. 29 2020), available at https://iopscience.iop.org/article/10.1088/1748-9326/abd19e/meta.
[51] Institute for Energy Economics and Financial Analysis, *The carbon capture crux: Lessons learned* (September 2022), available at https://ieefa.org/resources/carbon-capture-crux-lessons-learned.
[52] The CPS Rule referenced many other so called examples, but every other project referenced was either only at the planning stage and has not at this time demonstrated CCS in practice, or are smaller scale projects which do not claim to have demonstrated anywhere near the 90% capture efficiency the CPS Rule purported to set as BSER in the CPS Rule (*e.g.*, 180–MW Warrior Run plant capturing ~10 percent of the plant's $CO_2$ emissions, and AES's 320–MW coal-fired Shady Point plant only capturing $CO_2$ from an ~5 percent slipstream). *See* CPS Final Rule 39847-50.

(including leaking process heat exchangers, excess solids and slurry carryover in the flue gas leading to fouling and scaling of downstream equipment, and corrosion and scaling in the components of the $CO_2$ compressor), and took years of tuning to ramp-up capture efficiency.[53]

One (the Dam Unit 3 in Saskatchewan, Canada) after 8 years of operation, was only up to using its CCS unit 78.9% of the time as of 2022.[54] The other largescale demonstration (Petra Nova in Texas) has not used CCS continuously for extended periods because it was only able to get CCS operational in order to support enhanced oil recovery (EOR), which is not continuously economically feasible. Petra Nova shut down its CCS after three years due to economic infeasibility of continuing its use to support EOR. Furthermore, Petra Nova's self reported claims for marketing purposes that it captured 90% of its $CO_2$ emissions were not independently verified, let alone on a sustained and continual basis, as would be needed for even a baseline showing that the standard has ever been achieved anywhere (a necessary, but certainly not sufficient condition to qualify as BSER). The technical support documents underlying the CPS Rule also acknowledged that Petra Nova experienced outages due to inability of the sequestration site to accept $CO_2$ for EOR.[55] The CPS Rule was thus arbitrary for including EOR when estimating the availability of sequestration options, while simultaneously not accounting for the costs and energy generation and reliability issues that would be associated with such sequestration facilities being unable to accept the captured $CO_2$ for periods of time.

Moreover, the only way that the CPS Rule was able to claim that any facility reached anywhere close to 90% at any point in time was to blind itself to the fact that only a percentage of a portion of the total emissions from these facilities were siphoned off and directed through $CO_2$ capture equipment. Boundary Dam's slipstream capture system can target only 65 to 70 percent of the facility's total emissions.[56] Petra Nova's slipstream system captured just 33% of the facility's total emissions when it was online.[57] Plant Barry's slipstream system captured <u>less than 5%</u> of the facility's total emissions.[58] In other words, these systems are designed to capture a limited, consistent stream of emissions from a fraction of a facility's total emissions. But the leap from slipstream capture to a mandate for full facility capture was not legally justified or technically sound.

As a legal matter, the CPS Rule's reliance solely on slipstreams means that it did not identify that 90% CCS on a total capture basis is even an available technology. In fact, the failure to identify any facility that has successfully implemented sustained CCS on the full facility's emissions means that full stream emissions cannot be said to be current BSER at any rate.

As a technical matter, the CPS Rule's assumption that slipstream capture demonstrates feasibility of fullstream capture is simply wrong, and contradicted the evidence before the agency at the time. Indeed, the CPS Rule cited only one facility that ever attempted full-stream

[53] CPS Rule GHG Mitigation TSD at 22-23.
[54] CPS Proposed Rule 33292-93. Even the final rule's rosier best case scenario spin could a only claim a maximum capture rate of 83%, still under the undemonstrated level imposed in the CPS Rule. CPS Rule at 39848.
[55] GHG Mitigation TSD at 23.
[56] SaskPower Comments on CPS Proposed Rule at 1 (EPA-HQ-OAR-2023-0072).
[57] EEI Comments on CPS Proposed Rule at 72 (EPA-HQ-OAR-2023-0072)
[58] Buckeye Institute Comments on CPS Proposed Rule at 10 (EPA-HQ-OAR-2023-0072).

capture at 90%—Boundary Dam.[59]. Boundary Dam got close to demonstrating its design just once: during a single three-day test over a decade ago.[60]. That test—and the years of experience that followed—led Boundary Dam's owner to conclude that reliably operating the facility required employing a slipstream (rather than a full-stream system), limiting the capture rate to 65-75%. Even though Boundary Dam "was designed to achieve $CO_2$ capture rates of 90 percent" from the facility's full stream of emissions, it was unable to demonstrate that the design works.[61]. The fact that Boundary Dam—EPA's best example—tried and failed to implement a system like that contemplated by the CPS Rule confirms that the CPS Rule's BSER has not been adequately demonstrated, and in fact has been shown to not be consistently achievable at this point in time.

There is a good technical reason behind this lack of demonstration. Slipstream systems are used precisely because their variability can be limited, a far cry from the dynamic emission streams that an entire facility emits. As the CPS Rule itself acknowledged, "process value[s]," which control the effectiveness of capture technology, "such as flowrate, throughput or capacity . . . are designed to operate within specific ranges."[62]. At any size, the pressures and volumes in a slipstream remain fixed, predictable, and constant.[63]. The pressures and volumes in a facility's full stream lack such consistency and predictability.[64]. That is why slipstreams have been used: they ensure that those values can be maintained in a range that the capture system can handle.[65] Thus, even a large slipstream like that at Petra Nova is not equivalent to a small full-stream capture system. That variance is the key difference—not the size of the facility, but the ability to consistently control the stream. As EPA conceded, Boundary Dam is now able to handle variable load because it switched to a slipstream system.[66]

The CPS Rule's reliance on Dam Unit 3 and Petra Nova as demonstrating CCS to be adequately demonstrated also arbitrarily reversed EPA's prior determination based on the exact same evidence and data. EPA's 2019 Affordable Clean Energy (ACE) rulemaking expressly considered these very same two projects, and determined that they were not a sufficient basis to conclude that CCS was adequately demonstrated enough to constitute BSER, because "BSER is based on what is adequately demonstrated and broadly achievable across the country" and that the limited demonstrations at these two units was not sufficient to conclude that CCS was broadly achievable throughout the country.

The CPS Rule's reliance on the Petra Nova and Plant Barry facilities to argue that CCS was adequately demonstrated for purposes of section 111(d), was also independently unlawful because the Petra Nova and Plant Barry projects both received funding from the U.S. Department of Energy (DOE) through the Clean Coal Power Initiative[67], and thus pursuant to section 402(i) of the Energy Policy Act of 2005, EPA was precluded from considering the resulting emission

[59] 89 Fed. Reg. at 39,848.
[60] 89 Fed. Reg. at 39,848.
[61] 89 Fed. Reg. at 39,848.
[62] 89 Fed. Reg. at 39,853 n.358
[63] *See* NRECA-EERC Comments on the CPS Rule at 5.
[64] NRECA-Cichanowicz Comments on the CPS Rule at 3 & n.7
[65] *See id*.
[66] CI8244 (89 Fed. Reg. at 39853).
[67] 89 Fed. Reg. at 39,852 n.334.

reductions for purposes of determining that such reductions are "adequately demonstrated for purposes of section 111 of the Clean Air Act (42 U.S. Code § 7411)".[68]

Apart from these facilities, which do not demonstrate achievability of 90% continuous and consistent capture, the CPS Rule only pointed to pilot stage projects, and planned projects which have been announced, but which have not in fact demonstrated anything in real world application. Moreover, the CPS Rule had previously failed to identify any facilities that demonstrated successful operation of retrofit CCS on a coal fired power plant outside of the enhanced oil recovery context. Thus, the CPS Rule had never met the baseline requirement to demonstrate that 90% control of $CO_2$ via CCS was even possible, let alone achievable on a continuous and consistent basis, and let alone on a grand scale industrywide at facilities not located in the favorable EOR context of the Petra Nova plant.

The fact that certain *new* CCS units were and are still being planned does not show that CCS is available and technically feasible for *retrofit at all existing units*. Unlike other traditional control systems which actually control emissions at any given source where they are employed, carbon capture does not itself control emissions, but instead requires a sequestration or storage destination. And unlike new projects, which can be sited so as to take advantage of access to such infrastructure and geologic formations, existing units cannot relocate and have no likelihood, let alone guarantee, of being able to acquire the rights and authorizations needed to connect their existing facilities to such infrastructure or geologic formations.

### c. The CPS Rule's BSER Was Based on Arbitrary and Fatally Flawed Rationale, and Arbitrarily Departed from the EPA's Historic Practices and Determinations.

There were many arbitrary assumptions and unexplained reversals of prior EPA determinations underlying the CPS Rule, including the following:

- In the ACE rulemaking (from the First Trump Administration), EPA considered the fact that 10% of facilities were more than 100 miles from available geologic sequestration options in finding that CCS was not "broadly available" and "cannot be considered to be available across the existing coal fleet."[69] Yet the CPS Rule used the virtually identical fact that 10% of facilities are not within 100km of any adequate geologic sequestration option to reach the opposite conclusion that "Geologic sequestration potential for $CO_2$ is widespread and available throughout the U.S."[70] This was an arbitrary reversal.

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[68] *See* Section 402(i) of the EPAct05, codified at 42 U.S. Code § 15962(i) ("No technology, or level of emission reduction, solely by reason of the use of the technology, or the achievement of the emission reduction, by 1 or more facilities receiving assistance under this Act, shall be considered to be—(1) adequately demonstrated for purposes of section 7411 of this title"); the same is true of any project receiving tax credit for a qualifying advanced coal project credit per internal revenue code (IRC) section 48A(g), codified at 26 U.S. Code § 48A(g) ("No use of technology (or level of emission reduction solely by reason of the use of the technology), and no achievement of any emission reduction by the demonstration of any technology or performance level, by or at one or more facilities with respect to which a credit is allowed under this section, shall be considered to indicate that the technology or performance level is—(1) adequately demonstrated for purposes of section 111 of the Clean Air Act (42 U.S.C. 7411)").
[69] *See* 84 Fed. Reg. 32520, 32547-49.
[70] CPS Proposed Rule at 33347 (EPA-HQ-OAR-2023-0072).

- The CPS Rule acknowledged that 10% of facilities were not within 100km of an adequate sequestration site. But EPA's cost estimates did not reflect having to construct more than 100 km of pipeline infrastructure or rail for any facility. The CPS Rule addressed this only by noting that sources could use ship, road tanker, or rail tank cars to transport $CO_2$, but did not identify a single source that has demonstrated in practice that such shipment options were feasible at the scale required for continuous capture of 90% of a power plant's $CO_2$ emissions from 10% of existing facilities.

- When assessing the availability and feasibility of sequestration, the CPS Rule only relied on proximity to geographic sequestration *potential*, not to *existing sequestration infrastructure.*[71] But the CPS Rule failed to adequately account for the years of planning, site diligence, engineering, design, permitting, and construction required to create sequestration facilities and the transportation infrastructure to them when setting compliance deadlines for existing coal facilities, since the sequestration facility would have to be completed prior to connection or operation of CCS on the EGU itself.

- The CPS Rule acknowledged that CCS is an energy intensive process and would have a high parasitic energy requirement of approximately 23% of energy being dedicated to CCS at a new coal fired power plant, and even more for retrofitted CCS at existing sources.[72] The decreased efficiency required due to energy input of CCS means more non-GHG pollutants, which is a direct problem from an emission and health perspective and calls into question the CPS Rule's claimed benefits calculated based on projected decreases in ozone and $PM_{2.5}$. The CPS Rule attempted to brush off this issue by saying that these emissions can be mitigated by additional capital expenditures on other controls in addition to CCS, but it was arbitrary to use such an excuse without accounting for such costs in the CPS Rule's cost analysis.

- The CPS Rule also acknowledged that water consumption increases by approximately 36 percent on a gross basis when applying carbon capture, due to solvent water makeup and cooling demand, and a separate cooling water system dedicated to a $CO_2$ capture plant may be necessary. But the CPS Rule failed to assess the feasibility of such water requirements. The CPS Rule stated that regions with limited water supply may rely on dry or hybrid cooling systems, but acknowledged that these are less effective, and thus use of such systems would represent a cost the CPS Rule did not account for. Furthermore, even for regions that do have access to some water, the CPS Rule failed to account for the fact that some jurisdictions require water use permits or authorizations and thus that sources may not be able to control whether they have access to water to fill such a large increase in water requirements.

- The CPS Rule also acknowledged that "$CO_2$ capture systems have a sizeable physical footprint and a consequent land-use requirement" but, without further analysis, the CPS Rule found that "siting requirements are manageable and therefore the EPA does not expect any of these considerations to preclude coalfired power plants generally from being able to install and operate CCS." This finding failed to account for many relevant

[71] CPS Final Rule at 39886.
[72] *See* CPS Proposed Rule at 33349 (EPA-HQ-OAR-2023-0072).

factors, including availability of land for use, and the fact that siting that requires increasing the footprint of a facility may require review under state siting acts for power plants, and where the ability to expand footprints is subject to required permitting, it is arbitrary to simply assume that such permitting and authorizations will be obtainable.

- The CPS Rule's availability analysis also failed to account for the fact that, if implemented, there would be a surge of demand for availability of parts, labor, engineering, installation, etc. for an industry that is quite small, and such a huge mandate could overwhelm the few existing companies which currently build this technology.

- Finally, the EPA's related requirement for CCS at new EGUs under the section 111 NSPS likewise jeopardized development of new projects to replace any capacity lost from shutdown of existing coal capacity. As previously explained pipeline projects historically take years to develop and involve substantial uncertainty over success of permitting and land rights, and thus makes development of any new capacity difficult to impossible to finance. The CPS Rule's failure to account for this relevant factor was arbitrary. Relatedly, the CPS Rule's assumption that closing of some coal generation would not endanger national energy reliability because it would have been replaced by natural gas capacity ignored the fact that new natural gas capacity would be subject to the Proposed Rule's requirement that such facilities use CCS at a level not yet demonstrated to be achievable (along with the issues entailed above). Thus, to the extent that new capacity is delayed or not successfully developed due to issues noted above, the new capacity assumed by the CPS Rule may not in fact be available to replace coal that is driven off-line by the CPS Rule's CCS requirements. This is too great a risk to allow the CPS Rule to remain on the books, and "energy" is one of the considerations EPA must take into account when setting a standard of performance under section 111.

### d. The CPS Rule Failed to Address Statutorily Mandated Nonair Quality Health and Environmental Impact

The CPS Rule also failed to adequately address nonair quality health and environmental impacts—statutorily required considerations. Section 111(a)(1) commands that BSER must "tak[e] into account … any nonair quality health and environmental impact." Yet while the CPS Rule acknowledged that water consumption increases by approximately 36 percent on a gross basis when applying carbon capture, the agency did not address the many environmental implications of this increase, including whether adequate water withdrawals will be both available and permittable. The text of section 111(d) does not allow access to water that does not adversely affect watersheds and wetlands to simply be assumed away. Likewise, although the CPR rule stated that regions with limited water supply may rely on dry or hybrid cooling systems, it only acknowledged that these are less effective, without examination of the effectiveness and their impact on ability to comply with the standard and any other emissions implications. The nonair quality health and environmental impacts were accordingly not adequately taken into account. The CPS Rule also omitted the necessary analysis for areas that require permits to access the water. Again, without this analysis, the relevant nonair quality impact cannot have been adequately considered. These omissions amount to a failure to adhere to the statutory text of Section 111(a)(1).

### e. The CPS Rule's BSER Determination Violated the Major Questions Doctrine

As evidenced by the total lack of support for a proposition that 90% full-stream capture would be possible to retrofit at most, if any coal fired plants in the nation, the CPS Rule was a thinly veiled attempt to restructure an essential industry under the guise of "technology-based" standards. But "[w]hat cannot be done directly cannot be done indirectly."[73] And setting unachievable CCS-based standards does just that by effectively requiring coal plants to cease operations by 2032 or become dual-fuel plants and close by 2039, in either case restructuring the nation's energy grid in the face of the Supreme Court's express holding in *West Virginia* that Congress gave EPA no such authority. And the record showed that the CPS Rule's BSER will kill "most" coal by 2045 "due to the costs of meeting" the Rule's standards, including all non-CCS coal by 2035, and a net 32 GW loss of coal that same year. [74] Congress nowhere allowed EPA to "forc[e] coal plants to 'shift' away virtually all of their generation—i.e., to cease making power altogether"—no matter how EPA chose to frame the mechanism.[75] The lack of clear statement to force a shift away from coal is further exacerbated by the fact that section 111(d) does not even clearly authorize EPA to regulate existing power plants *at all*, given that they are a regulated source category already regulated under section 112, and the fact that nothing in section 111 expressly speaks to GHG emissions at all, which has been a major political issue as evidenced by Congress multiple attempts and failures to reach a consensus on appropriate regulatory structures for GHGs, and the changes in GHG and climate change related policies between administrations.

## IV. The CPS Rule and its CCS Cost Analysis was Inadequate, Arbitrary, and Unlawful

When setting emission standards under section 111 of the Clean Air Act, EPA is required to "take[] into account the cost of achieving such reduction…"[76] The CPS Rule violated this requirement by relying on unsound and arbitrary analyses, which is another sufficient basis to rescind the BSER it enacted.

### a. The CPS Rule's Reliance on Tax Credits and Other Government Allocations was Unlawful, and Arbitrary

EPA previously had expressly concluded in the ACE rule that CCS was excluded from BSER on cost grounds.[77] But the CPS Rule reversed that determination based on (1) conclusion that the cost of CCS has marginally declined based on a 2022 analysis of CCS costs, and (2) extended and increased tax credits for CCS under Internal Revenue Code (IRC) section 45Q. But both of these bases were arbitrary.

Regarding the "cost decline" rationale, even the CPS Rule admitted that, "before accounting for the IRC section 45Q tax credit for sequestered $CO_2$, using a 90 percent capture amine-based post-combustion $CO_2$ capture system increases the capital costs of a new combined

[73] *Students for Fair Admissions, inc. v. President & Fellows of Harvard Coll.,* 600 U.S. 181, 230 (2023) (cleaned up).
[74] CPS Rule Memo on Additional Modeling Analysis, at Tbl. 12.
[75] *West Virginia*, 597 U.S. at 728.
[76] 42 U.S. Code § 7411(a)(1).
[77] *See* 84 FR 32520, 32547-49.

cycle EGU by 115 percent on a $/kW basis" (i.e., CCS over doubles the cost of a new EGU). Something that doubles the cost of construction is not cost feasible. This is exacerbated by the fact that the CPS Rule ignored two other findings by EPA in the ACE rule, namely, that retrofit costs would be more than these costs calculated for new EGU construction, and that existing facilities often have low profit margins, such that even an increase of around 16% in costs (based on partial treatment with CCS which was estimated to cost only 28% of the 56 to 77 $/MWh increase calculated with respect to full CCS) "would almost certainly force the closure of the coal-fired power plants that would be required to install them. Many of those plants have a marginal profit margin, as demonstrated by the high rate of plant closure and the relatively low amounts of operation (*i.e.,* capacity factors) in recent years." EPA's failure to account for the low profit margins and sensitivity to cost increases and the extra costs entailed for retrofits rendered the CPS Rule arbitrary in this regard.

Moreover, the availability of subsidies, grants, and tax credits could not serve as a justification for finding that CCS is available or adequately demonstrated. In the first place, even where government funds are available, they typically do not fund the entirety of projects, but only some proportion. Furthermore, it could not have been guaranteed in advance that the project will be given full credit, since some of these funding programs and tax credits have additional prerequisites.

There were additional problems with the CPS Rule relying on speculative applicability of future tax credits to demonstrate that a particular technology is cost effective, rather than based on actual costs. For example, the CPS Rule assumed but does not even attempt to demonstrate that every single CCS imposed will qualify for the tax credit (which has various prerequisites including prevailing wage and apprenticeship requirements). Furthermore, the CPS Rule assumed the maximum credit for every CCS project, which is not guaranteed (e.g. if a company does not have sufficient utilization to receive the maximum tax credit, or if tax burdens are not high enough to require and be able to take advantage of all tax credits they might otherwise be entitled to). Additionally, the existence and amount of subsidies and tax credits over such an extended period of at least 12 years was wholly speculative, because allocated funds and budgets for federal programs and agencies can be clawed back and the existence of tax breaks of other financial incentives cannot be guaranteed over the longer term. This has been demonstrated vividly both by the recent dept ceiling negotiations, and even more recently by the Big Beautiful Bill (which, among other things terminated the Section 45V credit for facilities that begin construction after December 31, 2027, which was one of the primary tax credits the proposed version of the CPS Rule had relied on for its argument that hydrogen would become available and cost effective by the time of its proposed deadline). And more fundamentally, the fact that government funding is available to spend on a problem does not guarantee success as demonstrated by the high failure rate of CCS projects to date[78] despite the billions of dollars already allocated even prior to 2014. [79]

[78] Ahmed Abdulla et al, "Explaining successful and failed investments in U.S. carbon capture and storage using empirical and expert assessments," *Environmental Research Letters*, Volume 16, Number 1 (Dec. 29, 2020).
[79] See Congressional Resource Services Report, *Carbon Capture and Sequestration: Research, Development, and Demonstration at the U.S. Department of Energy* (February 10, 2014) (detailing federal CCS expenditures).

Accordingly it was arbitrary for the CPS Rule to rely on available government funding to find CCS to be available on an industrywide basis when in fact it has not been adequately demonstrated in practice.

Perhaps most fundamentally, the CPS Rule failed to truly "take into account the cost of achieving" CCS when it claimed that the 45Q tax credit lessened the excessive and unreasonable financial burden of CCS.[80] Tax credits are "tax expenditures" because they "reduce amounts available to the treasury."[81] "When the Government … allows deductions all taxpayers are affected," meaning the costs associated with the deductions do not disappear.[82] Thus, if a source received a 45Q tax credit, the "cost of achieving" CCS would not suddenly vanish—it would merely shift from the source to federal taxpayers. The funding source of the CCS systems changes, not the "cost of achieving" it. The CPS Rule contended that it was only required to take into account the source's cost of achieving CCS. But that is simply not what Section 111 requires. If Congress intended to limit the cost inquiry to the source it would have done so. This failure to consider the cost is both a failure to follow the statutory text and an arbitrary and capricious conclusion because the EPA failed to consider the financial burden to the taxpayer to pay for a source's CCS compliance.

### b. The CPS Rule's Reliance on Co-Reductions Was Unlawful and Arbitrary

The CPS Rule quantified anticipated benefits based on indirect reductions of $PM_{2.5}$ and Ozone expected based on co-reductions of $PM_{2.5}$, $NO_x$, and $SO_2$ that were expected to incidentally result from installation of CCS and the various other controls required for CCS to work.[83]. But it is not reasonable to take credit for co-reductions of pollutants other than the pollutant under consideration (here $CO_2$), and to give such co-reductions equal weight in calculating benefits as any cost benefits from reducing the pollutant under consideration. It is arbitrary to justify costs based on benefits other than the pollutant subject to a relevant proposed standard of performance (here $CO_2$), because that could be used to justify technology that are not cost effective at reducing the pollutant that EPA actually has jurisdiction to regulate, and could allow EPA to arbitrarily force reductions in other emissions that it does not otherwise have ability to force further reductions on, as long as it has a hook of some other pollutant that also happens to be reduced by the technology EPA wishes to mandate.

### c. The CPS Rule's Reliance on Social Cost of Carbon Was Flawed and Arbitrary

The CPS Rule quantified anticipated climate benefits from direct reductions of $CO_2$ based on an interim Social Cost of Carbon estimate developed by an Interagency Working Group in

[80] 42 U.S.C. sec. 7411(a)(1).
[81] *DaimlerChrysler Corp. v. Cuno*, 547 U.S. 332, 343 (2006); see 2 U.S.C. sec. 632(e)(2)(E); 31 U.S.C. sec. 1105(a)(16).
[82] *Bob Jones Univ. v. United States*, 461 U.S. 574, 591 (1983).
[83] *See* CPS Regulatory Impact Analysis for the Proposed New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule (May 2023) (RIA) at, *e.g.,* ES-17

February 2021.[84] Those estimates, relied on by the CPS Rule to justify its costs, in turn simply advised interim use of the most recent SC-GHG estimates developed by the IWG prior to the group being disbanded in 2017 (IWG 2016a) adjusted for inflation to 2019 dollars.[85] This reliance on the IWG SC-GHG estimates justifies EPA's reconsidering and recinding the CPS Rule for multiple reasons.

First, the IWG was disbanded in January of 2025 under Executive Order 14154. The same executive order also described the IWG's findings as "marked by logical deficiencies, a poor basis in empirical science, politicization, and the absence of a foundation in legislation." The executive order went on to describe that the IWG's findings are an "abuse [that] arbitrarily slows regulatory decisions and, by rendering the United States economy internationally uncompetitive, encourages a greater human impact on the environment by affording less efficient foreign energy producers a greater share of the global energy and natural resource market." This development supports EPA revisiting the cost-benefit analysis of regulations, like the CPS Rule, that relied on SC-GHG estimates in order to justify the costs and reasonableness of the regulation.

And in any case, it was arbitrary and unreasonable for the CPS Rule to rely on these social cost of carbon estimates in the first place, given the many issues identified with the arbitrariness and unlawfulness of these very same social cost of carbon estimates by stakeholders and states in other litigation to which the Biden EPA had been a party, without addressing the flaws that have been identified to EPA in such lawsuits.[86] These SC-GHG estimates are inherently unreliable, as they are themselves based on inherently unreliable projections of frequency, scope, and severity of future international conflicts and human migrations for the next 300 years, and ignore benefits of energy production, among other flaws identified in the referenced litigation and incorporated by reference herein. It was arbitrary for the CPS Rule to fail to address relevant considerations, and these many challenges to the validity and reliability of the 2021 social cost of carbon estimates are relevant considerations, which the CPS Rule should have addressed before deciding to rely on those estimates.[87]

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[84] *See* RIA at ES 13, 4-4 ("EPA has applied the IWG's recommended interim SC-GHG estimates in the Agency's regulatory benefit-cost analyses published since the release of the February 2021 SC-GHG TSD and is likewise using them in this RIA").

[85] *See* RIA at, *e.g.*, p. 4-6.

[86] *See Missouri v. Biden*, No. 4:21-cv-00287 (E.D. Mo., complaint filed, and motion for preliminary injunction filed May 3, 2021); *Louisiana v. Biden*, No. 2:21-cv-01074 (W.D. La., complaint filed April 22, 2021, and motion for preliminary injunction filed July 29, 2021). Notably, each of these cases were dismissed solely on standing grounds without any resolution of the merits against any of these challenges, as these states did not challenge the guidance in the context of its use in a specific rulemaking. Such standing concerns would not be at issue in a challenge to section 111 standards based on such standards, and this arbitrary reliance was in fact raised in the legal challenges to the CPS Rule that are still pending before the D.C. Circuit.

[87] *See FCC v. Prometheus Radio Project*, 141 S. Ct. 1150, 1158 (2021) (When an agency acts, it must "reasonably consider[] the relevant issues and reasonably explain[]" its actions) (citations omitted); *see also Michigan v. EPA*, 576 U.S. 743, 751–52 (2015) ("[A]gency action is lawful only if it rests on a consideration of the relevant factors" and "important aspect[s] of the problem.") (internal quotations and citations omitted).

EPA is right to finally abandon this SC-GHG exercise in soothsaying, and the CPS Rule's unreasoned reliance on SC-GHG is a basis for rescinding the CPS Rule based on its arbitrary cost considerations.

### d. The CPS Rule's Cost Considerations Were Flawed and Arbitrary in Many Other Respects

The CPS Rule's cost efficiency calculations did not account for the fundamental difference in scale of $CO_2$ emissions as compared to other pollutants EPA has analyzed for cost effectiveness in the past. The CPS Rule calculated that costs will be approximately $81/ton of $CO_2$ removed (accounting only for capture costs).[88] EPA previously determined that 75,000 tons $CO_2$ was a reasonable scale for comparison to the far lesser amounts of criteria pollutants (such as 40 tons for $NO_x$, or VOC).[89] If scaled based on these prior EPA estimates, this $81/ton of $CO_2$ would be equivalent to $151,875/ton of $NO_x$.[90] But EPA recently published a proposal setting a cost effectiveness threshold of $11,000/ton for $NO_x$ reductions from EGUs.[91] Accordingly, the CPS Rule's proposed cost effectiveness calculations were arbitrary and inconsistent with prior cost effectiveness findings in the context of other pollutants subject to regulation under section 111. Moreover, the fact that such scaling would be needed at all is further evidence that GHGs do not fit within the regulatory framework Congress has given EPA to implement, and EPA should wait for Congress to provide a legal framework for GHG regulation before attempting to shoehorn such a major question elephant into the various mouseholes of the CAA.

The CPS Rule also did not appear to have accounted for costs of lost revenue from downtime during CCS installation and testing, and during future downtime during which a facility had to be shut down due to any maintenance or malfunction of the CCS system, or the inability of a sequestration site to accept deliveries for any period of time. Such downtime would have been significant, and ignoring this relevant factor arbitrarily skewed the CPS Rule's cost assumptions extremely low and as a result makes them significantly flawed and arbitrary. The CPS Rule's cost analysis likewise did not appear to account for other indirect impacts of such temporary retrofit induced shutdowns, including unavailability of power to consumers during the shutdowns, security risks associated with even temporarily reduced electric generation capacity, direct costs to operators who pay salaried workforce, decreased salary impact to hourly workforce, and increased costs to the utilities, coal suppliers, and ratepayers purchasing needed makeup power on the open market.

The CPS Rule's cost considerations also failed to account for size and compositional differences among coal fired EGUs and their owners. For example, the costs imposed under the CPS Rule would have had a greater impact to merchant utilities who are unable to pass through costs to rate payer. Furthermore, the CPS Rule failed to account for the fact that CCS will not be as cost effective for smaller plants where CCS will not result in a smaller magnitude of $CO_2$

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[88] CPS Proposed Rule at 33298 (EPA-HQ-OAR-2023-0072).
[89] *Compare* 40 CFR 52.21(b)(23)(i) (setting PSD significance thresholds for various criteria pollutants), with 40 CFR 52.21(b)(49)(iii) setting equivalent PSD significance threshold for $CO_2$; *see also* 81 Fed. Reg 68110 (continuing to propose 75,000 tons $CO_2$ as an equivalent de minimis level for $CO_2$).
[90] (75,000tons/40tons = 1,875; 1,875 x $81/ton = $151,875/ton).
[91] *See* Federal ''Good Neighbor Plan'' for the 2015 Ozone National Ambient Air Quality Standards, 88 Fed. Reg. 36654 (June 5, 2023).

emission reductions, but would still face the bulk of the feasibility and cost issues outlined above in addition to those identified in the CPS Rule. Treating CCS as broadly applicable to all coal fired EGUs regardless of size thus inequitably and unreasonably placed an elevated burden on smaller MW plants who are "peak plants" and don't run baseload, but are required for grid reliability.

Furthermore and independently, it was arbitrary for the CPS Rule to account for MW size with respect to natural gas power fired plants (as the Biden EPA did throughout the CPS Rule) but not for coal fired EGUs. Also, both cost and compliance considerations are further complicated by plants with both regulated and merchant ownership, such as the Colstrip Generating Station in Montana. At Colstrip in particular, multiple of the utilities with an ownership share in Colstrip would have been forced to exit before 2030 or in some cases 2025, due to their state PUC mandates to shift away from coal. This would place a disproportional funding obligation on the remaining owners (post 2025). Furthermore, the CPS Rule did not account for the difference in ownership rights at some powerplants versus utility rights to transmit the power to the grid transmission, and what state and local PUC requirements are imposed on them. At Colstrip-some of the owners exiting their ownership rights at the end of 2025 have retained their transmission rights to bring other energy sources (non-coal) into their markets, so if such plants with multiple owners (such as Colstrip) were required to retrofit and cofire with another fuel source (e.g. natural gas, as currently required if the facility was willing to commit to closure by 2040, which it may or may not be able to do), such requirements may displace or impact what the owners may prefer to transmit pursuant to their PUC's directions.

Finally, the CPS Rule's cost analysis entirely failed to consider, quantitatively or qualitatively, the downstream economic costs of the Rule, including but not limited to closures of mines servicing coal fired power plants, whether due to reduced generation, retrofit to allow natural gas cofiring, or retirement. As just one example, the CPS Rule threatened the viability of Colstrip due to the cost and feasibility issues outlined throughout these comments. In addition to the direct costs imposed on Colstrip, its owner/operators, its workers, and the Colstrip community, impacts on Colstrip would also impact Westmoreland Mining Holdings, which operates the Rosebud mine that supplies coal to Colstrip Generating Station. As detailed in a recent study by Dr. Patrick Barkey, Director of the Bureau of Business and Economic Research at the University of Montana, a closure of the Rosebud mine and associated Colstrip Plant would be devastating for the State of Montana, resulting in loses of over 3,262 jobs, and a loss of over $240 million in income received by affected Montana households, over a billion dollars in lost economic output, and a shortfall of more than $100 million in state government revenue. [92]

[92] The Barkey Report, attached hereto, was prepared by Dr. Patrick Barkey in the specific context of US EPA's 2024 Mercury Air Toxics Risk and Technology Review (MATS RTR), to evaluate economic impacts in Montana if that rule forced closure of the Rosebud mine and Colstrip Power Plant. US EPA has since proposed to rescind that particular MATS RTR rule, but the threat of closure would be independently posed by the CPS Rule. The economic costs highlighted in this report were based on closure of the mine and plant regardless of the cause, and thus are equally applicable here, albeit any such forced closure due the CPS Rule would merely arise later in time than the 2027 timing discussed in the Barkey Report with respect to the MATS RTR timing.

## V. The Gas Co-Firing Alternative BSER for Existing Coal Units is Unlawful, Arbitrary, and Unsupported.

If the owner of a coal plant does not want to retire the plant by 2032 and cannot install 90% CCS by that date, the CPS Rule offered a third option: retirement by 2039 and conversion to a "hybrid" plant that combusts at least 40% natural gas for fuel (co-firing).[93] But what the CCS BSER attempted to do indirectly (forcing generation shifting via excessive cost and uncertainty) the co-firing BSER did by fiat. The 40% co-firing alternative was an undisguised requirement to shift energy generation from coal to gas—precisely what the Supreme Court said EPA cannot do.[94] Nor can this be considered traditional "fuel switching." That has only previously referred to standards for new sources that simply required a lower-emitting version of an already compatible fuel, and did not transform the source itself, such as requiring a low sulfur form of coal as opposed to a higher sulfur form. By contrast, coal-fired plants would have to undergo significant modifications to enable 40% co-firing, which even the CPS Rule acknowledged included "possible modifications" to millions of dollars of equipment such as the "steam superheater, reheater, and economizer heating surfaces that transfer heat from the hot flue gas"[95] Those coal-fired plants would thus cease to exist and would instead be transformed to a different type of facility, replaced with new hybrid coal/gas units. That transformation is at odds with EPA's Clean Air Act authority, and directly opposed to *West Virginia v. EPA*. The CPS Rule once again purported to decide "how much of a switch from coal to natural gas" is optimal—mandating 40%.

The co-firing BSER also violates Section 7411(a)(1) for at least four other reasons:

*First*, 40% co-firing is not achievable because the majority of coal-fired plants lack access to natural gas, and Section 7411 does not empower EPA to require the construction of thousands of miles of gas pipelines. A performance standard must "reflect[] the degree of emission limitation achievable through application of the" BSER. [96]That requires the standard be achievable now. Yet the 40% co-firing standard is not achievable now because it would require a massive build-out of natural gas infrastructure before most sources could hope to comply. Even under the data relied on by the Biden EPA, a substantial number (196 out of 565 coal fired electric generating units in the US at the end of 2021) have no connection to a gas pipeline, more than half (316) of those units do not use gas at all—either as a fuel or as a startup source, and nearly all—certainly the vast majority—of plants (536) have never co-fired at a level of over 40% for at least one year. Nor can the CPS Rule escape being overturned on this basis by the fact that implementation of any system of emission reduction will require sources to take steps to comply that cannot occur instantaneously; building thousands of miles of pipelines with its extended permitting and uncertain land control issues is categorically different from requiring individual facilities to install on-site emissions control equipment. And the example the Biden EPA relied on —involving flue gas desulfurization—simply proves the point of how different the CPS Rule's co-firing BSER is from traditional emission control requirements under Section 7411. When a flue gas desulfurization system is installed, the emission limit based on that control technology is realistically achievable at the source without anything more. In contrast,

[93] 89 Fed. Reg. at 39801.
[94] *West Virginia*, 597 U.S. at 728-29.
[95] CPS GHG Mitigation Measures-Steam at 9
[96] § 7411(a)(1) (emphases added).

under the CPS Rule, even if a boiler is modified to enable it to co-fire 40% natural gas, the emission limit is unachievable for most plants because they will still lack adequate access to gas.

*Second*, even if EPA could require the construction of pipeline infrastructure, the standard remains unachievable because there is no guarantee that the plant could obtain access to the large amount of natural gas necessary to co-fire at 40%. The fact that "most" plants are within 30 miles of some pipeline is no answer, because the Rule failed to look at the available firm-supply capacity of those pipelines. The CPS Rule provided no technical basis beyond naked assumptions that "firm" access would be available for natural gas, and instead relied on a consultant's conclusion that adequate gas would be available on the "spot" market. But firm access and the spot market are entirely different. The spot market does not provide the uninterruptible, consistent, and dependable supply of gas needed for 40% co-firing. EPA therefore has failed to address an important aspect of the problem—namely whether enough gas can be delivered on an uninterruptible and consistent basis (i.e., on a firm basis) and whether the existing pipeline capacity can provide it. This eliding of firm and spot markets also renders the CPS Rule's cost analysis arbitrary, because the Rule relied on firm access for purposes of its cost analysis, and the Rule never explained why its cost analysis assumed firm access when EPA's expert, which it was otherwise relying on, said the necessary supply of gas will be available only on the spot market, which is subject to entirely different pricing constraints, e.g. prices on the spot market can be extraordinarily high during times of peak demand.

*Third*, EPA's timeline for pipeline infrastructure construction is flawed. The CPS Rule's assumption that pipeline permitting and construction can be done in no more than 3 years was based on a consultant report about the *average* time to design, permit and construct a lateral pipeline, and the CPS Rule arbitrarily ignored the conclusion in that same report that some projects take "up to five years for approval and construction if they experience difficulties." [97] The estimate was also skewed because it was based only on lateral pipelines, which are shorter in length and less controversial and take less time to permit. But in reality, the record showed that to ensure reliability many powerplants are served by nonliteral pipelines.[98] And the estimate is skewed further by only accounting for pipelines that were actually built, and ignoring the fact that some are unable to overcome the obstacles. Given the recent history of opposition to pipeline construction (see details above) it is reasonable to assume that most, or at least many, owners will face difficulties in permitting and executing pipeline construction. It has become commonplace for pipeline projects to be met with resistance, subjecting projects to years of litigation, in some cases delaying construction by a decade, and in others making construction impossible. It was arbitrary for the CPS Rule to blinder itself to these challenges and rosily look at only the most favorable, or average conditions for successful projects.

*Fourth*, continuing to assume EPA could require thousands of miles of gas pipeline construction (which it cannot), the high cost of this infrastructure renders this BSER unlawful. The CPS Rule's cost estimates for natural gas pipelines were based on at least three faulty and arbitrary assumptions: (1) assuming plants "near" existing pipelines will have sufficient capacity; (2) evaluating cost based on firm access, even though its TSD said sufficient gas will be

[97] CPS GHG Mitigation Measures-Steam TSD, Att. 18 at 42.
[98] CPS GHG Mitigation Measures-Steam TSD, Att. 18 at 41 (identifying and excluding from analysis ten non-lateral pipelines that solely serve powerplants).

available only on the spot market; and (3) most facilities would need to build only short, "lateral" pipelines. And even by the Rule's own assumptions, the CPS Rule would require 3,500 miles of pipeline at a cost of approximately $11.5 billion dollars, or over $3 million per pipeline. This is not a reasonable cost to impose when the entire system they are expended to support must be closed down by 2039 in any event.

There are also other technical and cost related concerns that were ignored by the CPS Rule's co-firing BSER, including the facts that many coal fired plants were designed to burn specific blends of coal (adjacent to or abundantly available) and co-firing requirements (to any degree) would require significant investment and advanced engineering in hopes of evaluating if it is possible or cost effective to do so based on the expected lifespan of that power plant. Also, co-firing would be most efficient with multiple stacks-with each dedicated to a singular fuel source. Where you have only 1 or 2 stacks there may not be the ability to produce the necessary power generation depending on availability and pricing of either commodity (coal or natural gas). And this doesn't even begin to contemplate those plant owners who hedge power and sell power forward.

The CPS Rule's analysis of natural gas co-firing for facilities that commit to closure by 2039 also did not adequately address environmental impacts of co-firing. In the first place, co-firing with natural gas typically results in poorer power plant efficiency as compared to combustion of coal, and thus emission gains in terms of emissions per quantity of fuel must be counterbalanced by the greater amount of fuel required in order to achieve the same power output needs of the facility under a co-firing scenario. Furthermore, natural gas involves many upstream greenhouse gas emissions, including from potential leaks of methane during both drilling and transmission, which are a much more powerful greenhouse gas than $CO_2$. The CPS Rule's failure to quantitatively assess these emission offsets and increases involved in natural gas cofiring rendered the CPS Rule's conclusions with respect to assumed emission reductions associated with co-firing arbitrary.

## VI. EPA's repeal of Section 111(d) GHG Standards for Powerplants is Required by Congress' Limitations on the Scope of Section 111(d).

Section 111 primarily applies to setting standards for new sources, and that is how EPA has almost always used it. However, Section 111(d) allows EPA to publish regulations establishing a procedure for a State to submit a plan that "establishes standards of performance for any existing source for any air pollutant" (if not already subject to regulation under a national ambient air quality standard under CAA section 108, or a hazardous air pollutant emission standard under CAA Section 112) that would be subject to a standard of performance under Section 111 if the existing source were a new source.

But the express text of Section 111(d) prohibits EPA from using Section 111(d) to regulate pollutants "emitted from a source category that is regulated under section 112."[99] In 2012, EPA promulgated a national emission standard for coal power plants using Section 112 of the Clean Air Act.[100] Thus, based on the statutory text of section 111(d), because coal fired

[99] Pub. L. 101–549, §108(g), 104 Stat. 2399, 2467 (1990).
[100] *See* 77 Fed. Reg. 9304; 40 C.F.R. Part 63 Subpart UUUUU.

EGUs are a source category regulated under Section 112, they are thus exempt from any regulation under section 111(d).

This plain-language reading has been acknowledged by the Supreme Court.[101] This reading was also supported by prior D.C. Circuit decisions.[102] And EPA itself has repeatedly conceded that the text of §7411(d)(1) forecloses use of Section 111(d) to regulate emissions from sources categories which are regulated under Section 112.[103]

This makes good sense. Once EPA comprehensively regulates an industry under Section 112, EPA itself is charged with listing all the pollutants that warrant regulation and issuing standards under that program. EPA cannot deploy Section 111(d)'s complex machinery of cooperative federalism when it has already itself assumed full regulatory authority and responsibility over the industry's emissions. But whether or not a given agency thinks it makes sense, it is the decision that Congress has made.

Notably, however, the D.C. Circuit panel that was reversed by the Supreme Court in *West Virginia v. EPA* (based on getting the major questions doctrine wrong) also rejected this plain interpretation of section 111(d) (over the persuasive and legally correct dissent, by Judge Walker). The majority on the split panel was only able to avoid this obvious interpretation by misquoting and disregarding the Supreme Court's reading of section 111(d) in *AEP v. Connecticut*, and by leaning heavily on a non-substantive conforming amendment in the 1990 amendments, specifically Section 302(a), that purported to update a cross reference that was expressly deleted by the substantive revision in §108(g) which resulted in the text as codified in the US Code. Nor did the Court properly account for the fact that even EPA had previously made an express determination that Section 302(a) was a drafting error. *See* 70 Fed. Reg. 15994, 16031. Judge Walker's dissent, which was based on both section 111(d) and major questions grounds, was vindicated by the Supreme Court's holding on the major questions doctrine, but because the Supreme Court only granted certiorari on the major questions issue and did not reach this issue of section 111(d) applicability to section 112 source categories, the otherwise reversed majority on the D.C. Circuit panel was able to continue to dismiss this argument regarding the scope of section 111(d).[104] Accordingly, some individuals may claim that this argument has been precluded by D.C. Circuit precedent.

But there are at least two reasons that the erroneous interpretation of the reversed D.C. Circuit panel should not stop EPA from accounting for this argument from the clear text of section 111(d).

*First*, this issue has not yet squarely been ruled on by the Supreme Court and thus should still be raised as an alternative basis to preserve it for potential review.

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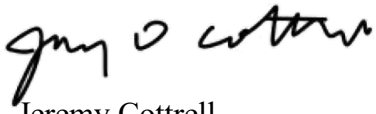
[101] *AEP v. Connecticut*, 564 U.S. 410, 424 n.7 (2011) ("EPA may not employ § 7411(d) if existing stationary sources of the pollutant in question are regulated under...the 'hazardous air pollutants' program, § 7412.").
[102] *E.g. New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008) (holding Section 111(d) "cannot be used to regulate sources listed under section 112.").
[103] *E.g.* 70 Fed. Reg. 15994, 16032 ("a literal reading of the House language would mean that EPA could not regulate HAP or non-HAP emitted from a source category regulated under section 112").
[104] *See* Amended Judgement in response to Supreme Court Order, *American Lung Association et al. v. EPA*, No. 19-1140 (D.C. Cir. Oct. 27, 2022) (ordering that Coal Petitioners' petitions for review of the ACE Rule be denied).

*Second*, the D.C. Circuit's dismissal order in *American Lung Association et al. v. EPA* with respect to this section 111(d) interpretation is not preclusive because that court never addressed the effect of the major questions doctrine (as formulated in *West Virginia v. EPA* and not as initially misunderstood by the reversed panel) on whether section 111(d) clearly authorized regulation of source categories already regulated under section 112. In other words, the D.C. Circuit dismissal order in *American Lung Association* does not foreclose EPA from concluding that implementing any GHG emission standard for fossil fuel fired power plants under section 111(d) would violate the major questions doctrine, because the regulation of GHGs in general, and in respect to the power sector in particular, is a question of major political and economic implications, and there is no clear statement of Congressional authorization for EPA to do so under section 111(d), given that section 111(d) does not even clearly authorize EPA to regulate existing power plants *at all*, given that they are a regulated source category already regulated under section 112. After all, *West Virginia* specifically called out "the previously little-used backwater of Section 111(d)" as "The last place one would expect to find" authorization for wide ranging EPA regulatory power such as "the decision of how much coalbased generation there should be over the coming decades."[105]

Finally, it is worth noting that EPA must address the effect of the D.C. Circuit's dismissal order in *American Lung Association et al. v. EPA* in any case, because that same order also dismissed the Coal Petitioners argument that pollutant specific endangerment findings are required as a prerequisite to regulation under section 111 (see above discussion). But again, that court never considered the impact of the major questions doctrine (or *Loper*) on that statutory interpretation question, and both clearly support an EPA determination that there is no clear Congressional authorization to regulate GHGs from powerplants without a prerequisite endangerment finding under section 111(d), just as there is no clear Congressional authorization to regulate any source category under section 111(d) that is also regulated under section 112.

Sincerely,



Jeremy Cottrell
*General Counsel & Secretary*
*Westmoreland Mining LLC*

[105] *West Virginia v. EPA*, 597 U.S. at 729.

**ORAL ARGUMENT NOT YET SCHEDULED**

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

| | |
|---|---|
| WESTMORELAND MINING HOLDINGS LLC,<br>*Petitioner*,<br>v.<br>U.S. ENVIRONMENTAL PROTECTION AGENCY, and MICHAEL S. REGAN, Administrator, U.S. Environmental Protection Agency,<br>*Respondents*. | No. 24-1194 (consolidated with No. 24-1119 et al.) |

**DECLARATION OF DR. PATRICK BARKEY**
**IN SUPPORT OF PETITIONER'S MOTION TO STAY FINAL RULE**

I, Dr. Patrick Barkey, make the following declaration pursuant to 28 U.S.C. § 1746 and state under penalty of perjury that the following is true and correct to the best of my knowledge:

1. I am the Director of the Bureau of Business and Economic Research at the University of Montana. I have held this position since 2008. I have been involved with economic forecasting and policy research for more than 30 years, in both the private and public sectors. Before joining the University of Montana, I served as the Director of the Bureau of Business Research at Ball State University in Indiana for fourteen years. My research has included a focus on the economic impact of energy development. I hold a

B.A. and a Ph.D. in economics from the University of Michigan. I am over the age of 18, have personal knowledge of the subject matter, and am competent to testify concerning the matters in this declaration.

2. I am submitting this declaration in support of Petitioners' Motions to Stay the Final Rule published by the U.S. Environmental Protection Agency (EPA) on May 7, 2024, entitled "National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review," 89 Fed. Reg. 38508 (Final Rule).

3. My study of the economic implications of the Final Rule, detailed in my Final Report attached as Exhibit A to the Declaration, gives me significant concern that the Final Rule will substantially harm the State of Montana's economy if it causes the closure of the Colstrip SES in mid-2027.

4. My conclusions are based on a comparison of two different futures for Montana's economy: 1) a baseline status quo projection where the Colstrip SES and the adjacent Rosebud coal mine continue to operate as today; 2) a premature retirement of the two facilities, with production ceasing in mid-2027. The latter scenario means the elimination of the economic input from the Colstrip SES, with important and substantial downstream implications for Montana's economy.

5. Specifically, if Colstrip SES closes, almost 600 jobs would be lost at the plant and Rosebud mine, and the downstream costs would cause over 3,000 jobs lost statewide. The average job lost from the closure makes over $84,000 per year. Further, the Sate of Montana would suffer a negative economic impact of over $1 billion per year, directly losing over $100 million in revenue per year.
6. These projections were made using an economic model that has been constructed and calibrated for this purpose, leased from Regional Economic Models, Inc. (REMI). The REMI model has been extensively documented and utilized in both peer-reviewed and other research studies. The model combines a detailed, 70-sector economic output model, a multi-equation econometric model and a demographic model to serve as a powerful tool to assess policies and events affecting the economy.

Executed in Missoula, Montana, on June 25, 2024.

Dr. Patrick Barkey
Director
Bureau of Business and Economic Research, University of Montana

# Exhibit A

# The Economic Implications of MATS Rulemaking in Montana
# Final Report

On April 25, 2024, the U.S. Environmental Protection Agency released a final rule significantly revising the Mercury Air and Toxics Standards (MATS) for coal-fired electric power plants. That rule would require substantial investment at the Colstrip Steam Electric Station (SES), Montana's largest electric generating facility located in Rosebud County in southeast Montana, to continue operation. Such an investment may not be technically or financially feasible for the facility. This would render the continued operation of the Colstrip SES beyond the date of July 8, 2027, when the applicable provisions of the new MATS go into effect, in doubt.

Should the MATS rulemaking result in the premature closure of the Colstrip SES, it would be a significant economic event. This was demonstrated by a 2018 study published by the University of Montana Bureau of Business and Economic Research (Bureau of Business and Economic Research, 2018), which found that an early closure of the coal-fired generator would have sizable impacts on jobs, incomes, tax revenue and population.

A key factor that contributed to the size and scope of the impacts identified in that study is the close relationship of the generating station to the adjacent Rosebud coal mine, owned and operated by Westmoreland. The Colstrip SES is a mine mouth plant, receiving its coal via a dedicated conveyor from the mine. With no rail access to ship its coal to the broader market, any circumstance that terminates electricity generation at the Colstrip SES would bring about the closure of the mine.

The purpose of this report is to bring those estimates of economic impacts up to date, using the most current operating information and conforming to the specific timetable of the MATS rulemaking. The research question addressed is: what would be the consequences for the Montana economy, in terms of jobs, income, spending, output and population, if the new MATS rulemaking brought about the closure of the Colstrip SES in mid-2027?

The basic approach of this research is to compare two futures for the state economy. The baseline projection is a status quo scenario where the generating station and the adjacent mine continue to operate as today. The alternative scenario is premature retirement of the two facilities, with production ceasing in mid-2027. In the alternative scenario, the economic flows ultimately supported by the production of electricity from the Colstrip SES, are removed from the economy, with important implications for those who receive those flow and spend again in the economy.

The difference between these two projections of the future of the Montana economy is the economic impact of the Colstrip SES closure. We produce these projections with an economic model that has been constructed and calibrated for this purpose, leased from Regional Economic Models, Inc. (REMI). The REMI model, described in more detail in Appendix B of this report, has been extensively documented and utilized in both peer-reviewed and other research studies. The model combines a detailed, 70-sector economic output model, a multi-equation econometric model and a demographic model to serve as a powerful tool to assess policies and events affecting the economy (Cassing & Giaratini, 1992).

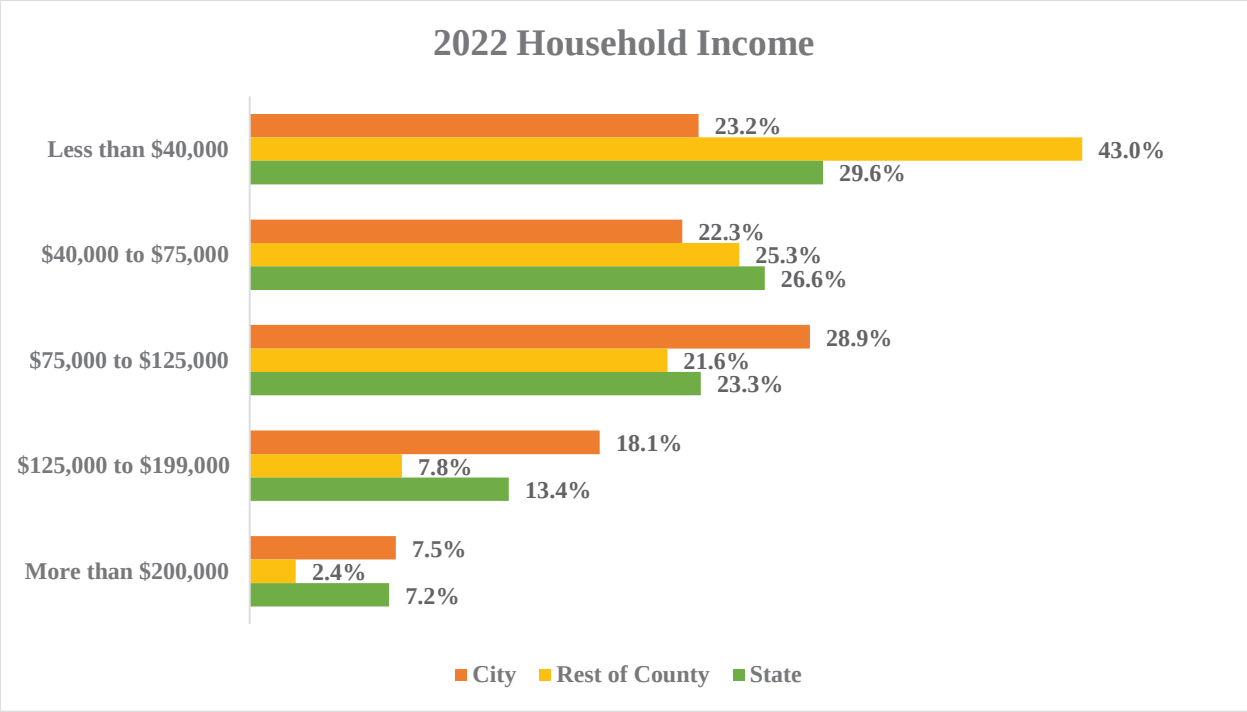
## About This Study

This study was produced by Patrick M. Barkey, Ph.D., who has been retained by Baker Botts and Baker & Hostetler LLP. The research was conducted in June of 2024. The study has benefited from operational and financial information on actual operations of both the Colstrip SES and the Rosebud Mine provided by the facilities themselves. All findings of this study, as well as any errors or omissions, are solely the responsibility of Dr. Barkey, who produced all the research findings in this report.

## The Colstrip SES and the Rosebud Mine

The city of Colstrip in Rosebud County in southeast Montana is home to two of the largest and highest paying industrial facilities in the entire state – the Colstrip SES and the Rosebud Mine. The economic prosperity that is enjoyed in the community today because of the presence of these major employers is evident from the earnings data from the American Community Survey conducted by the Census Bureau shown in Figure 1.

***Figure 1***




Compared to the state and especially to the remainder of Rosebud County, household income in the city of Colstrip is tilted to the upper side of the income distribution. Almost 29 percent of Colstrip households earn between $75,000 and $125,000 in annual income. All the earnings categories shown in the Figure above those amounts contain higher percentages of Colstrip households than elsewhere as well, which stands in stark contrast to most other communities in the eastern third of Montana.

## Summary of Findings

The basic finding of this research is that the premature closure of the Colstrip SES (which also necessitates the closure of the adjacent Rosebud Mine) would be a significant setback for the economy of the state of Montana. Based on a comparison of economic activity that is projected under a status quo, no-closure scenario, the research shows that an economy where the closures take place is smaller by:

- 3,262 permanent, year-round jobs in the year 2028, the first full year of closure for the mine and the generating station. The lost jobs occur across a wide spectrum of industries and occupations.

- $240.3 million dollars in income received by households during the year 2028, due to the loss of jobs and people in the smaller state economy that results from the closure of the facilities. The loss of $203.4 million in disposable, after tax, income received by households in 2028 represents a considerable decline in spending power in local economies throughout the state.

- Over a billion dollars in economic output, generally defined as gross receipts of business and non-business organizations. The loss of revenue from sales is felt by every industry in the economy, from health care to retail sales.

- $102.8 million in selected tax and non-tax revenues to Montana state government in 2028, due not only to the reduction in the size of the overall economy, but also to the loss of specific tax revenue from coal and utility operations in the wake of closures at the Colstrip SES and the Rosebud Mine.

- 1,305 people in 2028, growing to more than 4,100 people in year 2040, who leave the state due to the loss of economic opportunity due to MATS rulemaking-induced closures in Colstrip.

## *Table 1*

***The Economic Implications of MATS Rulemaking in Montana***
***Impacts Summary***

| | | Impacts by Year | | |
|---|---|---|---|---|
| Category | Units | 2028 | 2035 | 2040 |
| Total Employment | Jobs | -3,262 | -3,020 | -2,890 |
| Personal Income | $ Millions* | -240.3 | -284.8 | -310.0 |
| Disposable Personal Income | $ Millions* | -203.4 | -244.9 | -268.5 |
| Selected State Revenues | $ Millions* | -102.8 | -120.4 | -126.8 |
| Output | $ Millions* | -1,011.4 | -1,006.3 | -1,016.8 |
| Population | People | -1,305 | -3,647 | -4,106 |

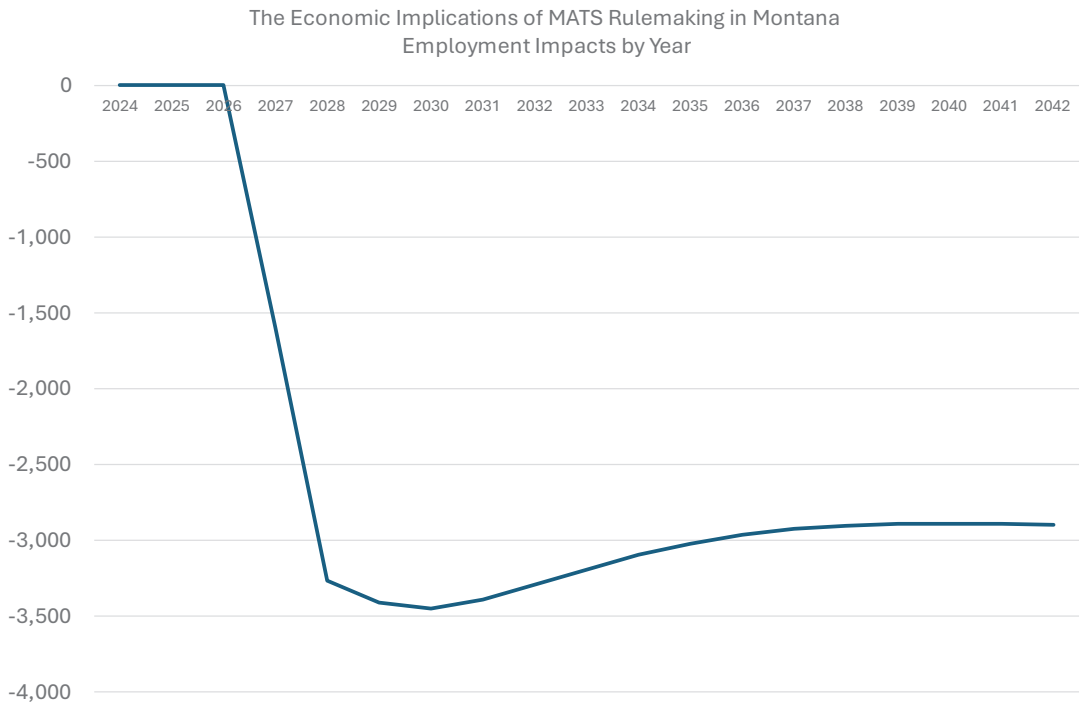
*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

Each of these specific impacts represent the difference in economic activity between a status quo, no closure economy and the economy that is expected to emerge after the closure of the Colstrip SES and the Rosebud Mine.

As shown in Table 1, the impacts of MATS rulemaking are expected to evolve over time over the next 15 years. These changes over time are the product of several different forces. Productivity gains over time slightly reduce the expected employment losses but result in income losses that are larger. The out-migration of Montanans who leave for other states (or those who would move here except for the closures) rises over time, with deleterious effects on everything from income to tax revenues.

The evolution of these impacts is shown graphically in Figure 2 for employment impacts. With the closures assumed to take place at the midpoint of year 2027, the first year with ceased operations at the mine and the generation station is 2028. Employment impacts grow in absolute value beyond that year as industries like construction suffer from the oversupply of structures. The low point is the year 2030, when employment impacts are 3.486 jobs.

## *Figure 2*




As is the case for most situations where jobs are created or lost in a regional economy, the number of jobs ultimately lost in the overall economy shown in Figure 2 exceeds the number of jobs eliminated at the mine and the generating station due to their closure. These knock-on effects in the overall economy occur as the lost revenue of those who previously received the employee and vendor spending of the facilities propagates through their own spending and employment. Nonetheless, the additional job losses that are expected to occur in the wake of MATS rulemaking-induced closures in Colstrip are large.

Three factors account for the magnitude of job losses that occur.

The first is the nature of the jobs at the mine and the generating station. These are capital-intensive, high value-added businesses that compensate their employees very well – average compensation at each facility is more than twice as high as the Montana average earnings per job.

Secondly, the production of coal and electricity involves a high fraction of inputs that are made in Montana. Thus, vendor spending of the facilities is more likely to be directed within the state, instead of being lost to the economy when purchases of goods and services are directed to suppliers located elsewhere.

Finally, there is the special tax treatment of production in natural resources in Montana, especially coal mining. Table 1 shows state revenue losses exceeding $100 million as a result of closures of the mine and generating station. These revenue losses result in a loss of government spending or possibly higher tax rates on the rest of the economy, which contribute to lower employment as well.

The impacts on the state economy that are caused by the MATS rulemaking-induced closure of the Colstrip SES and the adjacent Rosebud Mine that are summarized in Table 1 are sizable, yet they are likely to understate the losses that actually occur. This is because this analysis does not take into account

other factors and events that would occur in the wake of the loss of the state's largest producer of electricity. These include:

- The implications of the loss of property tax revenues to local governments
- The electricity rate implications of the stranded capital costs borne by the Montana investor-owned utility that is partial owner of the Colstrip SES
- The implications for pricing and reliability of electricity supply as Colstrip generation is lost
- The cost of building replacement generation

None of these factors are considered in the closure analysis presented here.

## Detailed Findings

Further insights on how the overall decline in the state economy caused by the MATS rulemaking-induced closures of the Colstrip SES and the Rosebud Mine can be gleaned from an examination of the impacts in greater detail.

Tables 2-7 on the following pages report on impacts for employment by industry, personal income, compensation and earnings, economic output, selected state tax and non-tax revenues, and population, respectively.

The employment impacts in Table 2 clearly show how the losses in utility and mining employment associated directly with the closures in Colstrip propagate to the broader economy.

### *Table 2*

***The Economic Implications of MATS Rulemaking in Montana***
***Employment Impacts (Jobs)***

| | Impacts by Year | | |
|---|---|---|---|
| **Industry** | 2028 | 2035 | 2040 |
| Construction | -592 | -362 | -254 |
| Manufacturing | -44 | -27 | -23 |
| Mining | -328 | -323 | -319 |
| Utilities | -270 | -266 | -265 |
| Retail Trade | -260 | -242 | -230 |
| Transportation and Warehousing | -66 | -52 | -49 |
| Professional and Technical Services | -171 | -164 | -160 |
| Administrative and Waste Services | -163 | -147 | -141 |
| Health Care and Social Assistance | -196 | -174 | -184 |
| Arts, Entertainment, and Recreation | -49 | -36 | -37 |
| Accommodation and Food Services | -169 | -199 | -212 |
| Other Services, except Public Administration | -130 | -115 | -116 |
| Other | -823 | -913 | -898 |
| **Total** | -3,262 | -3,020 | -2,890 |

Personal income is the income received by households. The detail on the components of the impacts on personal income shown in Table 3 reveals that while most of the losses stem from declines in earnings related to job losses, there are also sizable impacts on non-labor source of income that results from the smaller post-closure economy.

## *Table 3*

***The Economic Implications of MATS Rulemaking in Montana***
***Personal Income Impacts (Millions of Dollars*)***

| | | Impacts by Year | | |
|---|---|---|---|---|
| **Category** | | **2028** | **2035** | **2040** |
| **Total Earnings by Place of Work** | | **-275.4** | **-274.8** | **-273.2** |
| | Total Wage and Salary Disbursements | -188.4 | -192.1 | -192.2 |
| | Supplements to Wages and Salaries | -49.6 | -58.3 | -60.5 |
| | Employer contributions for employee pension and insurance funds | -31.6 | -37.2 | -38.6 |
| | Employer contributions for government social insurance | -17.9 | -21.1 | -21.9 |
| | Proprietors' income with inventory valuation and capital consumption adjustments | -37.4 | -24.4 | -20.5 |
| Less: | | | | |
| | Contributions for government social insurance | -37.1 | -39.9 | -40.2 |
| | Employee and self-employed contributions for government social insurance | -19.1 | -18.8 | -18.4 |
| | Employer contributions for government social insurance | -17.9 | -21.1 | -21.9 |
| Plus: | | | | |
| | Adjustment for residence | 0.7 | 0.7 | 0.6 |
| | Gross In | 0.1 | 0.3 | 0.3 |
| | Gross Out | -0.6 | -0.4 | -0.4 |
| Equals: | **Net earnings by place of residence** | **-237.6** | **-234.2** | **-232.3** |
| Plus: | | | | |
| | Property Income | -7.9 | -31.4 | -42.6 |
| | Dividends | -3.4 | -13.7 | -18.7 |
| | Interest | -2.9 | -11.5 | -15.3 |
| | Rent | -1.5 | -6.3 | -8.6 |
| | Personal Current Transfer Receipts | 5.1 | -19.1 | -35.2 |
| Equals: | **Personal Income** | **-240.3** | **-284.8** | **-310.0** |
| Less: | | | | |
| | Personal Current Taxes | -36.8 | -40.0 | -41.5 |
| Equals: | **Disposable Personal Income** | **-203.4** | **-244.9** | **-268.5** |

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

The additional detail on wages, compensation and earnings impacts shown in Table 4 show how income losses are borne by both wage and salary workers as well as business proprietors. The average earnings for the total of all jobs lost, as shown in the table, far exceeds the average earnings of jobs overall in Montana.

## *Table 4*

### *The Economic Implications of MATS Rulemaking in Montana*
### *Earnings and Compensation Impacts (Millions of Dollars*)*

| Category | Units | Impacts by Year 2028 | 2035 | 2040 |
|---|---|---|---|---|
| Wages and Salaries | $ Millions | -$188.4 | -$192.1 | -$192.2 |
| Compensation | $ Millions | -$238.0 | -$250.4 | -$252.7 |
| Earnings | $ Millions | -$275.4 | -$274.8 | -$273.2 |
| Earnings per Job, Lost Jobs | $ Dollars | $84,425 | $91,017 | $94,520 |

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

Economic output is defined as gross receipts of business and non-business organizations, with the exception of retail and wholesale trade, where markup is used. The output impacts in Table 5 show how the revenues of Montana industries are significantly affected by closures occurring in Colstrip. Including the lost revenues of the mine and generating station, these exceed $1 billion.

## *Table 5*

### *The Economic Implications of MATS Rulemaking in Montana*
### *Output Impacts (Millions of Dollars*)*

| Industry | Impacts by Year 2028 | 2035 | 2040 |
|---|---|---|---|
| Construction | -95.7 | -64.6 | -48.1 |
| Manufacturing | -30.5 | -18.0 | -15.7 |
| Utilities | -310.9 | -324.7 | -335.9 |
| Mining | -258.5 | -254.4 | -252.4 |
| Retail Trade | -31.2 | -35.8 | -39.3 |
| Transportation and Warehousing | -16.9 | -14.1 | -14.4 |
| Professional and Technical Services | -28.9 | -32.4 | -34.6 |
| Administrative and Waste Services | -18.6 | -19.7 | -20.7 |
| Health Care and Social Assistance | -29.5 | -31.0 | -35.8 |
| Arts, Entertainment, and Recreation | -4.4 | -3.6 | -3.8 |
| Accommodation and Food Services | -16.5 | -20.6 | -23.2 |
| Other Services, except Public Administration | -9.8 | -9.8 | -10.4 |
| Other Private | -94.4 | -88.4 | -92.1 |
| Government | -65.5 | -89.2 | -90.4 |
| **TOTAL** | **-$1,011.4** | **-$1,006.3** | **-$1,016.8** |

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

The smaller economy that results from the MATS rulemaking-induced closures in Colstrip yields a lower revenue base for the state. Revenues are also affected by the loss of production taxes at the Rosebud Mine and the Colstrip SES, which are categorized as selected sales taxes shown in Table 6. Not all revenue sources shown in the table are general fund revenues subject to the discretion of the legislature. Taken as a whole, they exceed $100 million per year.

*Table 6*

***The Economic Implications of MATS Rulemaking in Montana***
***Selected State Revenue Impacts (Millions of Dollars*)***

| | Impacts by Year | | |
|---|---|---|---|
| Category | 2028 | 2035 | 2040 |
| Intergovernmental Revenue | -5.3 | -14.9 | -16.8 |
| Selective Sales Tax | -46.9 | -47.3 | -47.5 |
| License Taxes | -1.1 | -1.3 | -1.4 |
| Individual Income Tax | -10.7 | -11.6 | -12.0 |
| Corporate Income Tax | -3.4 | -3.4 | -3.4 |
| Other Taxes | -2.6 | -3.0 | -3.3 |
| Current Charges | -3.5 | -4.1 | -4.5 |
| Miscellaneous General Revenue | -2.8 | -3.3 | -3.6 |
| Utility Revenue | -0.3 | -0.3 | -0.4 |
| Liquor Store Revenue | -0.7 | -0.8 | -0.8 |
| Insurance Trust Revenue | -25.6 | -30.3 | -33.0 |
| **Total** | **-$102.8** | **-$120.4** | **-$126.8** |

*All dollar amounts are inflation-corrected, expressed in terms of 2024 dollars.

An important factor in all of these detailed impacts is the change in population that is expected to occur due to the closures in Colstrip. This is not a prediction of overall population decline, but a population level that is lower than what would have occurred if the closures did not take place. As shown in Table 7, the population impacts increase substantially over time, and are dominated by those of working age and their children.

## *Table 7*

***The Economic Implications of MATS Rulemaking in Montana***
***Population Impacts (People)***

| Age Cohort | Impacts by Year 2028 | 2035 | 2040 |
|---|---|---|---|
| Ages 0-14 | -318 | -923 | -1,014 |
| Ages 15-24 | -279 | -452 | -507 |
| Ages 25-64 | -707 | -2,192 | -2,421 |
| Ages 65+ | -2 | -81 | -164 |
| Total | -1,305 | -3,647 | -4,106 |

## Conclusion

This report has summarized and documented the findings of an analysis of the economic implications of the MATS rulemaking in Montana. Specifically, it addresses how the MATS rulemaking-induced closure of the Colstrip Steam Electric Station (SES) in Rosebud County in southeast Montana due to the physical or economic infeasibility of meeting the reduced mercury emission threshold in the new final MATS rule would affect the economy of the state. The potential for economic harm from the rulemaking is made greater due to the tight coupling between the Colstrip SES and the immediately adjacent Rosebud Mine that serves the generation station with its coal supply via conveyor belt. This is because without substantial new development in rail infrastructure, the continued production of coal with the closure of the generating station would be impossible and its closure would occur as well.

The basic finding of this study is that implementation of the new MATS standard would be a significant negative event for the Montana economy. The loss of the high-paying jobs at the two facilities, and the cessation of the significant vendor spending and tax revenues associated with their operation, would ultimately precipitate a loss of 3,262 jobs in 2028, the first full year of closure after the new standards take effect. This impact represents the difference between what employment in the state would have been in a no-closure scenario and the post-closure job total. This employment impact grows to 3,446 jobs in 2030.

Other dimensions of economic vitality are presented in this report. All underscore the overall conclusion that a Montana economy that is required to meet the final rule of the U.S. Environmental Protection Agency's MATS regulation is smaller, less prosperous, and less populous than would occur if the current rules remained in effect.

## References

Bureau of Business and Economic Research. (2018). *The Economic Impact of the Early Retirement of Colstrip Units 3 and 4.* Montana Chamber Foundation.

Cassing, S., & Giaratini, F. (1992). An evaluation of the REMI model for the south coast air quality management district. *Environment and Planning,* 1549-1564.

# Appendix A

## REMI Model Output

**MATS rulemaking impacts - Economic Summary**

| Category | Units | Year 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Employment | Individuals (Jobs) | +1594.041 | +3261.849 | +3410.891 | +3446.125 | +3389.968 | +3293.942 | +3190.278 | +3095.574 | +3019.627 |
| Private Non-Farm Employment | Individuals (Jobs) | +1393.358 | +2812.036 | +2883.827 | +2879.690 | +2806.039 | +2704.940 | +2602.380 | +2511.644 | +2440.535 |
| Residence Adjusted Employment | Individuals | +1571.381 | +3213.912 | +3360.700 | +3398.749 | +3346.757 | +3255.275 | +3155.877 | +3064.884 | +2991.982 |
| Population | Individuals | +477.798 | +1304.930 | +1939.678 | +2440.929 | +2825.319 | +3117.124 | +3338.788 | +3510.243 | +3647.479 |
| Labor Force | Individuals | +496.955 | +1263.372 | +1732.339 | +2047.700 | +2239.303 | +2344.044 | +2392.071 | +2406.748 | +2404.735 |
| Gross Domestic Product | Millions of Fixed (2024) Dollars | +293.755 | +598.871 | +617.674 | +625.960 | +624.810 | +618.904 | +612.264 | +605.805 | +601.061 |
| Output | Millions of Fixed (2024) Dollars | +497.178 | +1011.370 | +1040.713 | +1051.794 | +1047.385 | +1036.244 | +1024.039 | +1013.485 | +1006.302 |
| Value-Added | Millions of Fixed (2024) Dollars | +293.755 | +598.871 | +617.674 | +625.960 | +624.810 | +618.904 | +612.264 | +605.805 | +601.061 |
| Personal Income | Millions of Fixed (2024) Dollars | +119.838 | +240.285 | +250.333 | +264.052 | +271.624 | +276.149 | +279.155 | +281.830 | +284.805 |
| Disposable Personal Income | Millions of Fixed (2024) Dollars | +101.413 | +203.446 | +212.042 | +224.263 | +231.361 | +235.993 | +239.093 | +241.781 | +244.851 |
| Real Disposable Personal Income | Millions of Fixed (2017) Dollars | +82.710 | +165.926 | +172.936 | +182.903 | +188.692 | +192.470 | +194.999 | +197.191 | +199.695 |
| Real Disposable Personal Income per Capita | Thousands of Fixed (2017) Dollars | +0.051 | +0.089 | +0.070 | +0.058 | +0.047 | +0.038 | +0.030 | +0.023 | +0.018 |
| PCE-Price Index | 2017=100 (Nation) | +0.004 | +0.035 | +0.065 | +0.070 | +0.073 | +0.073 | +0.073 | +0.072 | +0.071 |

**Comparison Type: Montana - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

**MATS rulemaking impacts - Economic Summary**

| Category | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
| Total Employment | Individuals (Jobs) | +2963.090 | +2925.639 | +2903.554 | +2893.035 | +2890.194 | +2892.077 | +2895.790 | +2899.300 | +2901.801 |
| Private Non-Farm Employment | Individuals (Jobs) | +2388.557 | +2354.860 | +2335.845 | +2327.745 | +2326.908 | +2330.537 | +2335.892 | +2341.091 | +2345.424 |
| Residence Adjusted Employment | Individuals | +2937.840 | +2902.210 | +2881.463 | +2871.916 | +2869.777 | +2872.174 | +2876.279 | +2880.111 | +2882.894 |
| Population | Individuals | +3761.717 | +3860.652 | +3949.665 | +4031.275 | +4106.385 | +4175.468 | +4238.252 | +4293.884 | +4341.941 |
| Labor Force | Individuals | +2395.987 | +2387.183 | +2381.338 | +2379.340 | +2381.361 | +2386.388 | +2393.607 | +2402.356 | +2411.168 |
| Gross Domestic Product | Millions of Fixed (2024) Dollars | +598.367 | +597.631 | +598.436 | +600.503 | +603.306 | +606.575 | +610.113 | +613.626 | +616.890 |
| Output | Millions of Fixed (2024) Dollars | +1002.551 | +1002.198 | +1004.923 | +1010.001 | +1016.793 | +1024.776 | +1033.363 | +1042.124 | +1050.881 |
| Value-Added | Millions of Fixed (2024) Dollars | +598.367 | +597.631 | +598.436 | +600.503 | +603.306 | +606.575 | +610.113 | +613.626 | +616.890 |
| Personal Income | Millions of Fixed (2024) Dollars | +288.394 | +292.810 | +298.006 | +303.836 | +310.033 | +316.507 | +323.079 | +329.599 | +335.949 |
| Disposable Personal Income | Millions of Fixed (2024) Dollars | +248.403 | +252.624 | +257.483 | +262.860 | +268.530 | +274.417 | +280.373 | +286.267 | +292.001 |
| Real Disposable Personal Income | Millions of Fixed (2017) Dollars | +202.591 | +206.034 | +209.997 | +214.382 | +219.006 | +223.808 | +228.665 | +233.472 | +238.149 |
| Real Disposable Personal Income per Capita | Thousands of Fixed (2017) Dollars | +0.015 | +0.011 | +0.009 | +0.007 | +0.005 | +0.004 | +0.003 | +0.002 | +0.001 |
| PCE-Price Index | 2017=100 (Nation) | +0.070 | +0.069 | +0.069 | +0.069 | +0.070 | +0.070 | +0.071 | +0.072 | +0.072 |

**Comparison Type: Montana - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

## MATS rulemaking impacts - Industry Profile

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
| **All Industries** | **Individuals (Jobs)** | **+1594.041** | **+3261.849** | **+3410.891** | **+3446.125** | **+3389.968** | **+3293.942** | **+3190.278** | **+3095.574** | **+3019.627** |
| Forestry and Logging; Fishing, hunting and trap | Individuals (Jobs) | +0.686 | +1.226 | +0.960 | +0.680 | +0.404 | +0.167 | -0.035 | -0.181 | -0.278 |
| Support activities for agriculture and forestry | Individuals (Jobs) | +0.329 | +0.474 | +0.107 | -0.252 | -0.575 | -0.822 | -1.051 | -1.202 | -1.298 |
| Oil and gas extraction | Individuals (Jobs) | +0.405 | +0.689 | +0.504 | +0.350 | +0.228 | +0.149 | +0.106 | +0.098 | +0.109 |
| Mining (except oil and gas) | Individuals (Jobs) | +164.007 | +328.274 | +327.594 | +326.943 | +326.364 | +326.019 | +324.593 | +323.471 | +322.512 |
| Support activities for mining | Individuals (Jobs) | +45.385 | +90.342 | +89.727 | +89.098 | +88.471 | +87.904 | +87.400 | +86.965 | +86.589 |
| Utilities | Individuals (Jobs) | +135.242 | +269.938 | +269.310 | +268.778 | +268.241 | +267.713 | +267.241 | +266.814 | +266.460 |
| Construction | Individuals (Jobs) | +273.560 | +592.224 | +656.048 | +650.076 | +603.458 | +539.353 | +472.701 | +412.014 | +361.841 |
| Wood product manufacturing | Individuals (Jobs) | +4.657 | +9.679 | +10.141 | +9.635 | +8.596 | +7.395 | +6.237 | +5.234 | +4.437 |
| Nonmetallic mineral product manufacturing | Individuals (Jobs) | +1.286 | +2.644 | +2.725 | +2.588 | +2.330 | +2.033 | +1.747 | +1.497 | +1.296 |
| Primary metal manufacturing | Individuals (Jobs) | +0.284 | +0.562 | +0.555 | +0.536 | +0.510 | +0.491 | +0.461 | +0.440 | +0.423 |
| Fabricated metal product manufacturing | Individuals (Jobs) | +3.060 | +6.188 | +6.281 | +6.028 | +5.576 | +5.087 | +4.582 | +4.157 | +3.816 |
| Machinery manufacturing | Individuals (Jobs) | +0.570 | +1.136 | +1.152 | +1.103 | +1.023 | +0.950 | +0.817 | +0.711 | +0.624 |
| Computer and electronic product manufacturin | Individuals (Jobs) | +0.294 | +0.463 | +0.202 | -0.091 | -0.382 | -0.641 | -0.844 | -1.002 | -1.118 |
| Electrical equipment, appliance, and component | Individuals (Jobs) | +0.003 | -0.003 | -0.020 | -0.038 | -0.054 | -0.067 | -0.078 | -0.087 | -0.093 |
| Motor vehicles, bodies and trailers, and parts r | Individuals (Jobs) | +0.734 | +1.503 | +1.599 | +1.623 | +1.603 | +1.570 | +1.518 | +1.471 | +1.430 |
| Other transportation equipment manufacturing | Individuals (Jobs) | +0.222 | +0.443 | +0.452 | +0.442 | +0.421 | +0.398 | +0.381 | +0.367 | +0.356 |
| Furniture and related product manufacturing | Individuals (Jobs) | +1.817 | +3.601 | +3.611 | +3.488 | +3.257 | +3.003 | +2.779 | +2.596 | +2.461 |
| Miscellaneous manufacturing | Individuals (Jobs) | +0.646 | +1.145 | +0.912 | +0.679 | +0.449 | +0.247 | +0.084 | -0.040 | -0.129 |
| Food manufacturing | Individuals (Jobs) | +2.958 | +5.952 | +6.143 | +6.241 | +6.204 | +6.134 | +6.010 | +5.921 | +5.867 |
| Beverage and tobacco manufacturing | Individuals (Jobs) | +2.042 | +4.213 | +4.619 | +4.940 | +5.117 | +5.210 | +5.239 | +5.247 | +5.247 |
| Textile mills and textile product mills | Individuals (Jobs) | +0.305 | +0.571 | +0.516 | +0.442 | +0.356 | +0.274 | +0.203 | +0.147 | +0.108 |
| Apparel, leather and allied product manufacturi | Individuals (Jobs) | +0.222 | +0.323 | +0.112 | -0.088 | -0.273 | -0.418 | -0.520 | -0.588 | -0.626 |
| Paper manufacturing | Individuals (Jobs) | +0.036 | +0.071 | +0.070 | +0.068 | +0.065 | +0.061 | +0.057 | +0.054 | +0.052 |
| Printing and related support activities | Individuals (Jobs) | +0.304 | +0.568 | +0.507 | +0.438 | +0.368 | +0.306 | +0.256 | +0.218 | +0.191 |
| Petroleum and coal products manufacturing | Individuals (Jobs) | +0.968 | +1.820 | +1.635 | +1.440 | +1.251 | +1.082 | +0.942 | +0.835 | +0.749 |
| Chemical manufacturing | Individuals (Jobs) | +0.280 | +0.505 | +0.415 | +0.327 | +0.244 | +0.171 | +0.106 | +0.054 | +0.013 |
| Plastics and rubber products manufacturing | Individuals (Jobs) | +1.530 | +3.050 | +3.073 | +2.998 | +2.859 | +2.717 | +2.565 | +2.441 | +2.339 |
| Wholesale trade | Individuals (Jobs) | +33.208 | +65.057 | +64.231 | +62.228 | +59.172 | +55.989 | +53.224 | +50.988 | +49.219 |
| Retail trade | Individuals (Jobs) | +129.909 | +259.946 | +267.649 | +270.333 | +266.420 | +259.614 | +252.877 | +246.710 | +241.774 |

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
| Air transportation | Individuals (Jobs) | +1,423 | +2,763 | +2,698 | +2,590 | +2,452 | +2,314 | +2,207 | +2,121 | +2,057 |
| Rail transportation | Individuals (Jobs) | +0.520 | +0.773 | +0.309 | -0.093 | -0.423 | -0.669 | -0.856 | -0.975 | -1.047 |
| Water transportation | Individuals (Jobs) | +0.026 | +0.052 | +0.051 | +0.050 | +0.049 | +0.049 | +0.046 | +0.045 | +0.044 |
| Truck transportation | Individuals (Jobs) | +11,822 | +23,719 | +23,949 | +23,600 | +22,845 | +22,072 | +21,027 | +20,215 | +19,555 |
| Couriers and messengers | Individuals (Jobs) | +3,559 | +6,803 | +6,228 | +5,585 | +4,899 | +4,279 | +3,746 | +3,350 | +3,077 |
| Transit and ground passenger transportation | Individuals (Jobs) | +3,767 | +7,740 | +8,068 | +8,158 | +8,086 | +7,934 | +7,776 | +7,641 | +7,554 |
| Pipeline transportation | Individuals (Jobs) | +1,530 | +2,935 | +2,741 | +2,568 | +2,418 | +2,332 | +2,234 | +2,194 | +2,170 |
| Scenic and sightseeing transportation and supp | Individuals (Jobs) | +8,507 | +16,811 | +16,489 | +16,148 | +15,797 | +15,533 | +15,156 | +14,892 | +14,675 |
| Warehousing and storage | Individuals (Jobs) | +1,988 | +3,965 | +3,952 | +3,900 | +3,805 | +3,696 | +3,601 | +3,518 | +3,456 |
| Publishing industries, except Internet | Individuals (Jobs) | +0.015 | -0.091 | -0.322 | -0.531 | -0.711 | -0.854 | -0.965 | -1.044 | -1.096 |
| Motion picture and sound recording industries | Individuals (Jobs) | +0.441 | +0.871 | +0.864 | +0.837 | +0.796 | +0.756 | +0.723 | +0.701 | +0.691 |
| Data processing, hosting, and related services; | Individuals (Jobs) | +1,107 | +2,263 | +2,360 | +2,415 | +2,428 | +2,421 | +2,407 | +2,386 | +2,366 |
| Radio and television broadcasting, media strea | Individuals (Jobs) | +0.598 | +1.208 | +1.252 | +1.273 | +1.272 | +1.263 | +1.253 | +1.245 | +1.242 |
| Telecommunications | Individuals (Jobs) | +0.992 | +1.898 | +1.774 | +1.626 | +1.469 | +1.325 | +1.208 | +1.118 | +1.056 |
| Monetary authorities - central bank, credit inte | Individuals (Jobs) | +1.379 | +1.809 | +0.110 | -1.378 | -2.647 | -3.647 | -4.403 | -4.937 | -5.278 |
| Securities, commodity contracts, investments, | Individuals (Jobs) | +14,847 | +28,911 | +27,763 | +26,219 | +24,539 | +23,037 | +21,728 | +20,763 | +20,107 |
| Insurance carriers and related activities | Individuals (Jobs) | +2,679 | +5,144 | +4,802 | +4,460 | +4,124 | +3,858 | +3,636 | +3,510 | +3,455 |
| Real estate | Individuals (Jobs) | +75,528 | +149,376 | +154,927 | +162,115 | +163,591 | +162,508 | +160,463 | +158,736 | +157,891 |
| Rental and leasing services; Lessors of nonfina | Individuals (Jobs) | +7,789 | +15,374 | +15,245 | +14,878 | +14,320 | +13,692 | +13,077 | +12,527 | +12,073 |
| Professional, scientific, and technical services | Individuals (Jobs) | +83,712 | +171,036 | +177,688 | +179,282 | +177,422 | +173,753 | +170,498 | +167,149 | +164,466 |
| Management of companies and enterprises | Individuals (Jobs) | +0.041 | -0.010 | -0.186 | -0.341 | -0.471 | -0.574 | -0.652 | -0.707 | -0.743 |
| Administrative and support services | Individuals (Jobs) | +84,109 | +167,703 | +167,871 | +166,866 | +164,347 | +160,812 | +157,713 | +154,485 | +151,860 |
| Waste management and remediation services | Individuals (Jobs) | -2,536 | -4,911 | -4,696 | -4,600 | -4,594 | -4,624 | -4,654 | -4,672 | -4,664 |
| Educational services; private | Individuals (Jobs) | +4,540 | +8,936 | +8,887 | +8,740 | +8,425 | +8,072 | +7,773 | +7,543 | +7,399 |
| Ambulatory health care services | Individuals (Jobs) | +58,956 | +111,059 | +104,169 | +100,515 | +96,008 | +91,894 | +88,948 | +86,862 | +85,711 |
| Hospitals | Individuals (Jobs) | +18,429 | +37,002 | +38,575 | +40,012 | +40,660 | +40,981 | +41,217 | +41,514 | +41,941 |
| Nursing and residential care facilities | Individuals (Jobs) | +5,893 | +11,527 | +11,418 | +11,313 | +11,041 | +10,764 | +10,545 | +10,417 | +10,391 |
| Social assistance | Individuals (Jobs) | +18,637 | +36,849 | +37,063 | +37,247 | +36,879 | +36,365 | +35,963 | +35,764 | +35,827 |
| Performing arts, spectator sports, and related | Individuals (Jobs) | +8,230 | +15,307 | +13,952 | +13,031 | +12,054 | +11,187 | +10,492 | +9,980 | +9,654 |
| Museums, historical sites, and similar institutio | Individuals (Jobs) | +0.044 | +0.033 | -0.065 | -0.151 | -0.224 | -0.282 | -0.327 | -0.359 | -0.380 |
| Amusement, gambling, and recreation industrie | Individuals (Jobs) | +17,998 | +33,861 | +31,897 | +31,010 | +29,816 | +28,660 | +27,734 | +27,060 | +26,670 |

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
| Accommodation | Individuals (Jobs) | +18.283 | +34.261 | +32.335 | +31.864 | +31.097 | +30.411 | +29.952 | +29.776 | +29.904 |
| Food services and drinking places | Individuals (Jobs) | +66.531 | +134.894 | +143.631 | +152.770 | +158.507 | +162.150 | +164.725 | +166.727 | +168.631 |
| Repair and maintenance | Individuals (Jobs) | +16.162 | +32.536 | +33.889 | +34.876 | +35.055 | +34.846 | +34.509 | +34.184 | +33.963 |
| Personal and laundry services | Individuals (Jobs) | +25.537 | +48.474 | +46.544 | +46.451 | +45.740 | +44.952 | +44.302 | +43.853 | +43.663 |
| Religious, grantmaking, civic, professional, and | Individuals (Jobs) | +22.458 | +43.184 | +41.793 | +40.682 | +39.135 | +37.576 | +36.242 | +35.188 | +34.451 |
| Private households | Individuals (Jobs) | +2.867 | +5.370 | +4.971 | +4.669 | +4.329 | +4.008 | +3.737 | +3.524 | +3.369 |
| State and Local Government | Individuals (Jobs) | +200.645 | +449.739 | +526.989 | +566.359 | +583.854 | +588.927 | +587.823 | +583.857 | +579.019 |
| Federal Civilian | Individuals (Jobs) | +0.024 | +0.048 | +0.048 | +0.048 | +0.048 | +0.048 | +0.047 | +0.047 | +0.047 |
| Federal Military | Individuals (Jobs) | +0.014 | +0.027 | +0.027 | +0.027 | +0.027 | +0.027 | +0.027 | +0.027 | +0.027 |
| Farm | Individuals (Jobs) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Category: Montana - Comparison Type: Employment - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

**MATS rulemaking impacts - Industry Profile**

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
| **All Industries** | **Individuals (Jobs)** | **+2963.090** | **+2925.639** | **+2903.554** | **+2893.035** | **+2890.194** | **+2892.077** | **+2895.790** | **+2899.300** | **+2901.801** |
| Forestry and Logging; Fishing, hunting and trap | Individuals (Jobs) | -0.334 | -0.357 | -0.358 | -0.343 | -0.319 | -0.290 | -0.259 | -0.228 | -0.199 |
| Support activities for agriculture and forestry | Individuals (Jobs) | -1.350 | -1.370 | -1.366 | -1.348 | -1.320 | -1.287 | -1.252 | -1.218 | -1.185 |
| Oil and gas extraction | Individuals (Jobs) | +0.134 | +0.169 | +0.212 | +0.260 | +0.312 | +0.366 | +0.422 | +0.478 | +0.534 |
| Mining (except oil and gas) | Individuals (Jobs) | +321.685 | +320.967 | +320.332 | +319.763 | +319.231 | +318.739 | +318.275 | +317.831 | +317.407 |
| Support activities for mining | Individuals (Jobs) | +86.263 | +85.984 | +85.743 | +85.535 | +85.350 | +85.187 | +85.038 | +84.902 | +84.775 |
| Utilities | Individuals (Jobs) | +266.159 | +265.908 | +265.695 | +265.507 | +265.329 | +265.162 | +264.998 | +264.834 | +264.669 |
| Construction | Individuals (Jobs) | +322.938 | +294.629 | +275.151 | +262.445 | +254.494 | +249.726 | +246.735 | +244.540 | +242.590 |
| Wood product manufacturing | Individuals (Jobs) | +3.842 | +3.428 | +3.162 | +3.005 | +2.921 | +2.887 | +2.881 | +2.885 | +2.891 |
| Nonmetallic mineral product manufacturing | Individuals (Jobs) | +1.143 | +1.032 | +0.957 | +0.907 | +0.876 | +0.857 | +0.844 | +0.835 | +0.827 |
| Primary metal manufacturing | Individuals (Jobs) | +0.410 | +0.401 | +0.394 | +0.390 | +0.386 | +0.383 | +0.380 | +0.378 | +0.376 |
| Fabricated metal product manufacturing | Individuals (Jobs) | +3.557 | +3.371 | +3.246 | +3.163 | +3.109 | +3.073 | +3.050 | +3.032 | +3.016 |
| Machinery manufacturing | Individuals (Jobs) | +0.556 | +0.504 | +0.464 | +0.432 | +0.425 | +0.422 | +0.421 | +0.421 | +0.422 |
| Computer and electronic product manufacturin | Individuals (Jobs) | -1.200 | -1.254 | -1.288 | -1.306 | -1.314 | -1.314 | -1.310 | -1.303 | -1.294 |
| Electrical equipment, appliance, and component | Individuals (Jobs) | -0.097 | -0.100 | -0.102 | -0.103 | -0.104 | -0.104 | -0.104 | -0.103 | -0.103 |
| Motor vehicles, bodies and trailers, and parts r | Individuals (Jobs) | +1.397 | +1.372 | +1.352 | +1.336 | +1.323 | +1.311 | +1.301 | +1.291 | +1.281 |
| Other transportation equipment manufacturing | Individuals (Jobs) | +0.349 | +0.344 | +0.342 | +0.341 | +0.342 | +0.343 | +0.344 | +0.346 | +0.347 |
| Furniture and related product manufacturing | Individuals (Jobs) | +2.368 | +2.313 | +2.288 | +2.287 | +2.302 | +2.328 | +2.360 | +2.392 | +2.424 |
| Miscellaneous manufacturing | Individuals (Jobs) | -0.190 | -0.229 | -0.250 | -0.258 | -0.259 | -0.253 | -0.245 | -0.234 | -0.223 |
| Food manufacturing | Individuals (Jobs) | +5.842 | +5.847 | +5.866 | +5.896 | +5.928 | +5.955 | +5.973 | +5.978 | +5.968 |
| Beverage and tobacco manufacturing | Individuals (Jobs) | +5.245 | +5.246 | +5.253 | +5.258 | +5.258 | +5.253 | +5.244 | +5.229 | +5.209 |
| Textile mills and textile product mills | Individuals (Jobs) | +0.082 | +0.068 | +0.060 | +0.057 | +0.058 | +0.060 | +0.063 | +0.066 | +0.070 |
| Apparel, leather and allied product manufacturi | Individuals (Jobs) | -0.638 | -0.629 | -0.605 | -0.572 | -0.534 | -0.495 | -0.456 | -0.418 | -0.383 |
| Paper manufacturing | Individuals (Jobs) | +0.050 | +0.049 | +0.048 | +0.047 | +0.047 | +0.046 | +0.046 | +0.046 | +0.045 |
| Printing and related support activities | Individuals (Jobs) | +0.174 | +0.163 | +0.158 | +0.156 | +0.156 | +0.157 | +0.158 | +0.159 | +0.160 |
| Petroleum and coal products manufacturing | Individuals (Jobs) | +0.681 | +0.627 | +0.583 | +0.547 | +0.515 | +0.488 | +0.462 | +0.438 | +0.415 |
| Chemical manufacturing | Individuals (Jobs) | -0.019 | -0.045 | -0.066 | -0.083 | -0.098 | -0.110 | -0.122 | -0.133 | -0.144 |
| Plastics and rubber products manufacturing | Individuals (Jobs) | +2.260 | +2.201 | +2.158 | +2.127 | +2.101 | +2.079 | +2.060 | +2.042 | +2.024 |
| Wholesale trade | Individuals (Jobs) | +47.853 | +46.858 | +46.166 | +45.663 | +45.271 | +44.958 | +44.671 | +44.384 | +44.096 |
| Retail trade | Individuals (Jobs) | +237.862 | +235.045 | +232.919 | +231.446 | +230.376 | +229.521 | +228.661 | +227.679 | +226.589 |

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
| Air transportation | Individuals (Jobs) | +2.010 | +1.979 | +1.961 | +1.952 | +1.947 | +1.947 | +1.948 | +1.949 | +1.951 |
| Rail transportation | Individuals (Jobs) | -1.082 | -1.092 | -1.085 | -1.065 | -1.039 | -1.008 | -0.974 | -0.940 | -0.905 |
| Water transportation | Individuals (Jobs) | +0.044 | +0.044 | +0.043 | +0.043 | +0.043 | +0.043 | +0.043 | +0.043 | +0.043 |
| Truck transportation | Individuals (Jobs) | +19.032 | +18.636 | +18.335 | +18.108 | +17.927 | +17.780 | +17.646 | +17.516 | +17.389 |
| Couriers and messengers | Individuals (Jobs) | +2.905 | +2.818 | +2.798 | +2.824 | +2.881 | +2.958 | +3.044 | +3.133 | +3.222 |
| Transit and ground passenger transportation | Individuals (Jobs) | +7.510 | +7.509 | +7.537 | +7.586 | +7.649 | +7.720 | +7.794 | +7.866 | +7.938 |
| Pipeline transportation | Individuals (Jobs) | +2.157 | +2.153 | +2.156 | +2.164 | +2.175 | +2.190 | +2.205 | +2.221 | +2.238 |
| Scenic and sightseeing transportation and supp | Individuals (Jobs) | +14.491 | +14.337 | +14.201 | +14.080 | +13.968 | +13.863 | +13.760 | +13.657 | +13.555 |
| Warehousing and storage | Individuals (Jobs) | +3.412 | +3.384 | +3.369 | +3.364 | +3.363 | +3.365 | +3.368 | +3.370 | +3.372 |
| Publishing industries, except Internet | Individuals (Jobs) | -1.125 | -1.138 | -1.140 | -1.135 | -1.125 | -1.112 | -1.097 | -1.082 | -1.066 |
| Motion picture and sound recording industries | Individuals (Jobs) | +0.690 | +0.696 | +0.710 | +0.726 | +0.744 | +0.762 | +0.779 | +0.794 | +0.808 |
| Data processing, hosting, and related services; | Individuals (Jobs) | +2.349 | +2.333 | +2.330 | +2.330 | +2.333 | +2.337 | +2.340 | +2.342 | +2.343 |
| Radio and television broadcasting, media strea | Individuals (Jobs) | +1.244 | +1.250 | +1.259 | +1.271 | +1.283 | +1.295 | +1.307 | +1.317 | +1.326 |
| Telecommunications | Individuals (Jobs) | +1.015 | +0.993 | +0.985 | +0.987 | +0.994 | +1.005 | +1.018 | +1.030 | +1.043 |
| Monetary authorities - central bank, credit inte | Individuals (Jobs) | -5.472 | -5.557 | -5.559 | -5.506 | -5.417 | -5.305 | -5.181 | -5.051 | -4.918 |
| Securities, commodity contracts, investments, | Individuals (Jobs) | +19.697 | +19.500 | +19.450 | +19.501 | +19.604 | +19.742 | +19.889 | +20.027 | +20.150 |
| Insurance carriers and related activities | Individuals (Jobs) | +3.456 | +3.505 | +3.589 | +3.696 | +3.816 | +3.944 | +4.074 | +4.203 | +4.328 |
| Real estate | Individuals (Jobs) | +157.957 | +158.986 | +160.767 | +163.071 | +165.674 | +168.381 | +171.014 | +173.419 | +175.545 |
| Rental and leasing services; Lessors of nonfin | Individuals (Jobs) | +11.704 | +11.416 | +11.179 | +10.986 | +10.819 | +10.673 | +10.539 | +10.411 | +10.287 |
| Professional, scientific, and technical services | Individuals (Jobs) | +162.500 | +161.229 | +160.585 | +160.374 | +160.379 | +160.519 | +160.688 | +160.806 | +160.840 |
| Management of companies and enterprises | Individuals (Jobs) | -0.766 | -0.779 | -0.784 | -0.784 | -0.781 | -0.776 | -0.770 | -0.764 | -0.757 |
| Administrative and support services | Individuals (Jobs) | +149.805 | +148.289 | +147.152 | +146.282 | +145.545 | +144.894 | +144.268 | +143.617 | +142.919 |
| Waste management and remediation services | Individuals (Jobs) | -4.633 | -4.582 | -4.512 | -4.430 | -4.340 | -4.244 | -4.147 | -4.051 | -3.958 |
| Educational services; private | Individuals (Jobs) | +7.330 | +7.330 | +7.384 | +7.473 | +7.589 | +7.719 | +7.853 | +7.983 | +8.111 |
| Ambulatory health care services | Individuals (Jobs) | +85.210 | +85.303 | +85.859 | +86.755 | +87.957 | +89.326 | +90.719 | +92.071 | +93.387 |
| Hospitals | Individuals (Jobs) | +42.494 | +43.176 | +43.964 | +44.822 | +45.704 | +46.573 | +47.402 | +48.149 | +48.795 |
| Nursing and residential care facilities | Individuals (Jobs) | +10.453 | +10.593 | +10.788 | +11.022 | +11.273 | +11.524 | +11.768 | +11.995 | +12.208 |
| Social assistance | Individuals (Jobs) | +36.089 | +36.563 | +37.226 | +37.996 | +38.840 | +39.725 | +40.603 | +41.450 | +42.264 |
| Performing arts, spectator sports, and related | Individuals (Jobs) | +9.471 | +9.411 | +9.441 | +9.529 | +9.648 | +9.782 | +9.913 | +10.028 | +10.125 |
| Museums, historical sites, and similar institutio | Individuals (Jobs) | -0.392 | -0.399 | -0.400 | -0.399 | -0.396 | -0.391 | -0.385 | -0.379 | -0.373 |
| Amusement, gambling, and recreation industrie | Individuals (Jobs) | +26.490 | +26.510 | +26.682 | +26.941 | +27.253 | +27.594 | +27.898 | +28.167 | +28.387 |

| Industry | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
| Accommodation | Individuals (Jobs) | +30.265 | +30.840 | +31.571 | +32.388 | +33.251 | +34.119 | +34.960 | +35.747 | +36.478 |
| Food services and drinking places | Individuals (Jobs) | +170.501 | +172.492 | +174.557 | +176.651 | +178.727 | +180.732 | +182.610 | +184.296 | +185.799 |
| Repair and maintenance | Individuals (Jobs) | +33.854 | +33.868 | +33.974 | +34.140 | +34.331 | +34.528 | +34.711 | +34.864 | +34.980 |
| Personal and laundry services | Individuals (Jobs) | +43.659 | +43.846 | +44.159 | +44.592 | +45.131 | +45.705 | +46.267 | +46.793 | +47.285 |
| Religious, grantmaking, civic, professional, and | Individuals (Jobs) | +33.957 | +33.695 | +33.667 | +33.755 | +33.914 | +34.115 | +34.317 | +34.496 | +34.643 |
| Private households | Individuals (Jobs) | +3.256 | +3.180 | +3.131 | +3.101 | +3.083 | +3.072 | +3.062 | +3.051 | +3.037 |
| State and Local Government | Individuals (Jobs) | +574.460 | +570.706 | +567.638 | +565.219 | +563.215 | +561.470 | +559.829 | +558.141 | +556.308 |
| Federal Civilian | Individuals (Jobs) | +0.046 | +0.046 | +0.046 | +0.045 | +0.045 | +0.045 | +0.044 | +0.044 | +0.043 |
| Federal Military | Individuals (Jobs) | +0.026 | +0.026 | +0.026 | +0.026 | +0.026 | +0.026 | +0.025 | +0.025 | +0.025 |
| Farm | Individuals (Jobs) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Category: Montana - Comparison Type: Employment - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

**MATS rulemaking impacts - Income Profile**

| Category | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
| Total Earnings by Place of Work | Millions of Fixed (2024) Dollars | +136.280 | +275.380 | +284.758 | +291.746 | +291.612 | +288.028 | +283.222 | +278.545 | +274.837 |
| Total Wages and Salaries | Millions of Fixed (2024) Dollars | +93.310 | +188.418 | +194.859 | +200.071 | +200.726 | +199.099 | +196.597 | +194.066 | +192.125 |
| Supplements to Wages and Salaries | Millions of Fixed (2024) Dollars | +23.984 | +49.596 | +52.868 | +55.552 | +56.940 | +57.614 | +57.937 | +58.128 | +58.279 |
| Employer contributions for employee pens | Millions of Fixed (2024) Dollars | +15.304 | +31.648 | +33.736 | +35.449 | +36.335 | +36.764 | +36.971 | +37.092 | +37.189 |
| Employer contributions for government so | Millions of Fixed (2024) Dollars | +8.679 | +17.948 | +19.132 | +20.103 | +20.606 | +20.849 | +20.966 | +21.036 | +21.090 |
| Proprietors' income with inventory valuati | Millions of Fixed (2024) Dollars | +18.986 | +37.367 | +37.031 | +36.123 | +33.946 | +31.314 | +28.688 | +26.350 | +24.433 |
| Less: Contributions for Government Social Ins | Millions of Fixed (2024) Dollars | +18.214 | +37.082 | +38.815 | +40.219 | +40.695 | +40.671 | +40.419 | +40.110 | +39.875 |
| Employee and Self-Employed Contributions | Millions of Fixed (2024) Dollars | +9.535 | +19.134 | +19.683 | +20.116 | +20.089 | +19.822 | +19.453 | +19.075 | +18.785 |
| Employer contributions for government so | Millions of Fixed (2024) Dollars | +8.679 | +17.948 | +19.132 | +20.103 | +20.606 | +20.849 | +20.966 | +21.036 | +21.090 |
| Plus: Adjustment for Residence | Millions of Fixed (2024) Dollars | -0.301 | -0.741 | -0.893 | -0.897 | -0.873 | -0.833 | -0.789 | -0.748 | -0.712 |
| Gross Inflow | Millions of Fixed (2024) Dollars | -0.014 | -0.137 | -0.257 | -0.276 | -0.285 | -0.286 | -0.284 | -0.279 | -0.274 |
| Gross Outflow | Millions of Fixed (2024) Dollars | +0.287 | +0.605 | +0.636 | +0.621 | +0.588 | +0.547 | +0.506 | +0.469 | +0.438 |
| Equals: Net Earnings by Place of Residence | Millions of Fixed (2024) Dollars | +117.765 | +237.557 | +245.049 | +250.630 | +250.045 | +246.523 | +242.014 | +237.687 | +234.250 |
| Plus: Property Income | Millions of Fixed (2024) Dollars | +4.060 | +7.854 | +10.106 | +14.852 | +19.040 | +22.801 | +26.041 | +28.882 | +31.422 |
| Personal Dividend Income | Millions of Fixed (2024) Dollars | +1.801 | +3.437 | +4.415 | +6.467 | +8.263 | +9.867 | +11.272 | +12.525 | +13.652 |
| Personal Interest Income | Millions of Fixed (2024) Dollars | +1.466 | +2.878 | +3.691 | +5.426 | +6.976 | +8.392 | +9.580 | +10.591 | +11.486 |
| Rental Income of Persons | Millions of Fixed (2024) Dollars | +0.793 | +1.539 | +2.000 | +2.959 | +3.801 | +4.542 | +5.188 | +5.765 | +6.284 |
| Plus: Personal Current Transfer Receipts | Millions of Fixed (2024) Dollars | -1.986 | -5.126 | -4.822 | -1.430 | +2.539 | +6.824 | +11.100 | +15.262 | +19.133 |
| Equals: Personal Income | Millions of Fixed (2024) Dollars | +119.838 | +240.285 | +250.333 | +264.052 | +271.624 | +276.149 | +279.155 | +281.830 | +284.805 |
| Less: Personal current taxes | Millions of Fixed (2024) Dollars | +18.426 | +36.839 | +38.292 | +39.789 | +40.264 | +40.156 | +40.061 | +40.049 | +39.954 |
| Equals: Disposable personal income | Millions of Fixed (2024) Dollars | +101.413 | +203.446 | +212.042 | +224.263 | +231.361 | +235.993 | +239.093 | +241.781 | +244.851 |

**Comparison Type: Montana - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

## MATS rulemaking impacts - Income Profile

| Category | Units | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
| Total Earnings by Place of Work | Millions of fixed (2024) Dollars | +272.327 | +271.092 | +270.981 | +271.757 | +273.181 | +275.060 | +277.197 | +279.431 | +281.682 |
| Total Wages and Salaries | Millions of fixed (2024) Dollars | +190.889 | +190.408 | +190.565 | +191.211 | +192.201 | +193.446 | +194.828 | +196.265 | +197.713 |
| Supplements to Wages and Salaries | Millions of fixed (2024) Dollars | +58.478 | +58.782 | +59.223 | +59.798 | +60.475 | +61.212 | +61.988 | +62.764 | +63.523 |
| Employer contributions for employee pens | Millions of fixed (2024) Dollars | +37.316 | +37.510 | +37.791 | +38.158 | +38.590 | +39.061 | +39.555 | +40.051 | +40.535 |
| Employer contributions for government so | Millions of fixed (2024) Dollars | +21.162 | +21.272 | +21.432 | +21.640 | +21.885 | +22.152 | +22.432 | +22.713 | +22.988 |
| Proprietors' income with inventory valuatio | Millions of fixed (2024) Dollars | +22.961 | +21.902 | +21.193 | +20.748 | +20.505 | +20.402 | +20.381 | +20.402 | +20.445 |
| Less: Contributions for Government Social Ins | Millions of fixed (2024) Dollars | +39.746 | +39.738 | +39.834 | +40.010 | +40.241 | +40.517 | +40.814 | +41.122 | +41.431 |
| Employee and Self-Employed Contributions | Millions of fixed (2024) Dollars | +18.584 | +18.466 | +18.402 | +18.370 | +18.356 | +18.365 | +18.382 | +18.408 | +18.443 |
| Employer contributions for government so | Millions of fixed (2024) Dollars | +21.162 | +21.272 | +21.432 | +21.640 | +21.885 | +22.152 | +22.432 | +22.713 | +22.988 |
| Plus: Adjustment for Residence | Millions of fixed (2024) Dollars | -0.684 | -0.663 | -0.649 | -0.640 | -0.635 | -0.633 | -0.633 | -0.634 | -0.636 |
| Gross Inflow | Millions of fixed (2024) Dollars | -0.270 | -0.268 | -0.266 | -0.266 | -0.266 | -0.268 | -0.270 | -0.272 | -0.274 |
| Gross Outflow | Millions of fixed (2024) Dollars | +0.414 | +0.395 | +0.383 | +0.374 | +0.368 | +0.365 | +0.363 | +0.362 | +0.362 |
| Equals: Net Earnings by Place of Residence | Millions of fixed (2024) Dollars | +231.898 | +230.692 | +230.498 | +231.108 | +232.305 | +233.911 | +235.750 | +237.675 | +239.616 |
| Plus: Property Income | Millions of fixed (2024) Dollars | +33.745 | +35.991 | +38.206 | +40.402 | +42.562 | +44.728 | +46.858 | +48.968 | +51.047 |
| Personal Dividend Income | Millions of fixed (2024) Dollars | +14.688 | +15.694 | +16.690 | +17.680 | +18.658 | +19.643 | +20.614 | +21.580 | +22.536 |
| Personal Interest Income | Millions of fixed (2024) Dollars | +12.296 | +13.073 | +13.834 | +14.583 | +15.314 | +16.042 | +16.753 | +17.452 | +18.136 |
| Rental Income of Persons | Millions of fixed (2024) Dollars | +6.761 | +7.224 | +7.683 | +8.139 | +8.590 | +9.043 | +9.490 | +9.935 | +10.376 |
| Plus: Personal Current Transfer Receipts | Millions of fixed (2024) Dollars | +22.752 | +26.127 | +29.302 | +32.326 | +35.167 | +37.867 | +40.471 | +42.956 | +45.286 |
| Equals: Personal Income | Millions of fixed (2024) Dollars | +288.394 | +292.810 | +298.006 | +303.836 | +310.033 | +316.507 | +323.079 | +329.599 | +335.949 |
| Less: Personal current taxes | Millions of fixed (2024) Dollars | +39.991 | +40.186 | +40.522 | +40.975 | +41.504 | +42.089 | +42.706 | +43.332 | +43.948 |
| Equals: Disposable personal income | Millions of fixed (2024) Dollars | +248.403 | +252.624 | +257.483 | +262.860 | +268.530 | +274.417 | +280.373 | +286.267 | +292.001 |

**MATS rulemaking impacts - Output**

| Industry | Units | Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
| **All Industries** | **Millions of Fixed (2024) Dollars** | **+497.178** | **+1011.370** | **+1040.713** | **+1051.794** | **+1047.385** | **+1036.244** | **+1024.039** | **+1013.485** |
| Forestry and Logging; Fishing, hunting and trap | Millions of Fixed (2024) Dollars | +0.157 | +0.286 | +0.229 | +0.165 | +0.099 | +0.039 | -0.014 | -0.057 |
| Support activities for agriculture and forestry | Millions of Fixed (2024) Dollars | +0.010 | +0.016 | +0.009 | +0.002 | -0.005 | -0.011 | -0.016 | -0.020 |
| Oil and gas extraction | Millions of Fixed (2024) Dollars | +0.452 | +0.764 | +0.496 | +0.244 | +0.014 | -0.174 | -0.322 | -0.428 |
| Mining (except oil and gas) | Millions of Fixed (2024) Dollars | +129.533 | +258.525 | +257.920 | +257.243 | +256.558 | +255.877 | +255.350 | +254.853 |
| Support activities for mining | Millions of Fixed (2024) Dollars | +7.057 | +14.260 | +14.413 | +14.554 | +14.681 | +14.811 | +14.946 | +15.090 |
| Utilities | Millions of Fixed (2024) Dollars | +154.968 | +310.943 | +312.477 | +314.395 | +316.324 | +318.305 | +320.397 | +322.509 |
| Construction | Millions of Fixed (2024) Dollars | +43.723 | +95.722 | +107.506 | +108.032 | +101.700 | +92.214 | +82.016 | +72.552 |
| Wood product manufacturing | Millions of Fixed (2024) Dollars | +1.442 | +3.035 | +3.231 | +3.121 | +2.832 | +2.479 | +2.129 | +1.819 |
| Nonmetallic mineral product manufacturing | Millions of Fixed (2024) Dollars | +0.417 | +0.869 | +0.913 | +0.884 | +0.813 | +0.726 | +0.639 | +0.562 |
| Primary metal manufacturing | Millions of Fixed (2024) Dollars | +0.238 | +0.477 | +0.480 | +0.471 | +0.455 | +0.444 | +0.424 | +0.410 |
| Fabricated metal product manufacturing | Millions of Fixed (2024) Dollars | +0.730 | +1.502 | +1.561 | +1.533 | +1.452 | +1.356 | +1.251 | +1.161 |
| Machinery manufacturing | Millions of Fixed (2024) Dollars | +0.166 | +0.338 | +0.354 | +0.349 | +0.334 | +0.319 | +0.285 | +0.257 |
| Computer and electronic product manufacturin | Millions of Fixed (2024) Dollars | +0.084 | +0.138 | +0.071 | -0.009 | -0.091 | -0.167 | -0.229 | -0.280 |
| Electrical equipment, appliance, and component | Millions of Fixed (2024) Dollars | +0.001 | +0.001 | -0.002 | -0.005 | -0.008 | -0.010 | -0.013 | -0.015 |
| Motor vehicles, bodies and trailers, and parts n | Millions of Fixed (2024) Dollars | +0.344 | +0.724 | +0.792 | +0.827 | +0.839 | +0.845 | +0.838 | +0.832 |
| Other transportation equipment manufacturing | Millions of Fixed (2024) Dollars | +0.056 | +0.116 | +0.123 | +0.125 | +0.124 | +0.122 | +0.121 | +0.120 |
| Furniture and related product manufacturing | Millions of Fixed (2024) Dollars | +0.230 | +0.463 | +0.472 | +0.464 | +0.440 | +0.412 | +0.387 | +0.367 |
| Miscellaneous manufacturing | Millions of Fixed (2024) Dollars | +0.128 | +0.238 | +0.207 | +0.173 | +0.136 | +0.102 | +0.074 | +0.052 |
| Food manufacturing | Millions of Fixed (2024) Dollars | +0.871 | +1.774 | +1.859 | +1.915 | +1.927 | +1.927 | +1.908 | +1.897 |
| Beverage and tobacco manufacturing | Millions of Fixed (2024) Dollars | +0.460 | +0.955 | +1.054 | +1.134 | +1.182 | +1.210 | +1.224 | +1.234 |
| Textile mills and textile product mills | Millions of Fixed (2024) Dollars | +0.038 | +0.071 | +0.066 | +0.057 | +0.047 | +0.038 | +0.029 | +0.022 |
| Apparel, leather and allied product manufacturi | Millions of Fixed (2024) Dollars | +0.013 | +0.020 | +0.008 | -0.003 | -0.014 | -0.023 | -0.029 | -0.033 |
| Paper manufacturing | Millions of Fixed (2024) Dollars | +0.005 | +0.009 | +0.009 | +0.009 | +0.009 | +0.008 | +0.008 | +0.008 |
| Printing and related support activities | Millions of Fixed (2024) Dollars | +0.064 | +0.123 | +0.114 | +0.102 | +0.088 | +0.076 | +0.065 | +0.057 |
| Petroleum and coal products manufacturing | Millions of Fixed (2024) Dollars | +9.783 | +18.595 | +16.974 | +15.248 | +13.559 | +12.059 | +10.849 | +9.953 |
| Chemical manufacturing | Millions of Fixed (2024) Dollars | +0.135 | +0.249 | +0.216 | +0.184 | +0.152 | +0.125 | +0.101 | +0.083 |
| Plastics and rubber products manufacturing | Millions of Fixed (2024) Dollars | +0.400 | +0.807 | +0.826 | +0.818 | +0.792 | +0.763 | +0.730 | +0.704 |
| Wholesale trade | Millions of Fixed (2024) Dollars | +12.679 | +25.495 | +25.898 | +25.800 | +25.205 | +24.489 | +23.888 | +23.466 |
| Retail trade | Millions of Fixed (2024) Dollars | +15.141 | +31.247 | +33.213 | +34.606 | +35.147 | +35.275 | +35.370 | +35.508 |

## MATS rulemaking impacts - Output

| Industry | Units | Year 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 |
|---|---|---|---|---|---|---|---|---|---|
| **All Industries** | **Millions of Fixed (2024) Dollars** | **+1006.302** | **+1002.551** | **+1002.198** | **+1004.923** | **+1010.001** | **+1016.793** | **+1024.776** | **+1033.363** |
| Forestry and Logging; Fishing, hunting and trap | Millions of fixed (2024) Dollars | -0.088 | -0.109 | -0.122 | -0.129 | -0.132 | -0.133 | -0.131 | -0.129 |
| Support activities for agriculture and forestry | Millions of fixed (2024) Dollars | -0.023 | -0.025 | -0.026 | -0.027 | -0.027 | -0.027 | -0.026 | -0.026 |
| Oil and gas extraction | Millions of fixed (2024) Dollars | -0.508 | -0.568 | -0.612 | -0.642 | -0.662 | -0.674 | -0.681 | -0.684 |
| Mining (except oil and gas) | Millions of fixed (2024) Dollars | +254.386 | +253.951 | +253.549 | +253.155 | +252.771 | +252.388 | +252.004 | +251.618 |
| Support activities for mining | Millions of fixed (2024) Dollars | +15.244 | +15.406 | +15.573 | +15.751 | +15.938 | +16.133 | +16.337 | +16.548 |
| Utilities | Millions of fixed (2024) Dollars | +324.685 | +326.866 | +329.029 | +331.270 | +333.560 | +335.919 | +338.348 | +340.829 |
| Construction | Millions of fixed (2024) Dollars | +64.649 | +58.490 | +54.018 | +51.006 | +49.134 | +48.083 | +47.595 | +47.431 |
| Wood product manufacturing | Millions of fixed (2024) Dollars | +1.568 | +1.378 | +1.245 | +1.159 | +1.109 | +1.084 | +1.076 | +1.078 |
| Nonmetallic mineral product manufacturing | Millions of fixed (2024) Dollars | +0.500 | +0.452 | +0.418 | +0.395 | +0.381 | +0.374 | +0.370 | +0.369 |
| Primary metal manufacturing | Millions of fixed (2024) Dollars | +0.400 | +0.393 | +0.390 | +0.388 | +0.389 | +0.390 | +0.392 | +0.394 |
| Fabricated metal product manufacturing | Millions of fixed (2024) Dollars | +1.089 | +1.035 | +0.998 | +0.975 | +0.963 | +0.958 | +0.958 | +0.961 |
| Machinery manufacturing | Millions of fixed (2024) Dollars | +0.235 | +0.217 | +0.203 | +0.192 | +0.184 | +0.183 | +0.184 | +0.186 |
| Computer and electronic product manufacturin | Millions of fixed (2024) Dollars | -0.320 | -0.351 | -0.374 | -0.391 | -0.404 | -0.414 | -0.421 | -0.428 |
| Electrical equipment, appliance, and component | Millions of fixed (2024) Dollars | -0.016 | -0.017 | -0.018 | -0.019 | -0.019 | -0.020 | -0.020 | -0.020 |
| Motor vehicles, bodies and trailers, and parts n | Millions of fixed (2024) Dollars | +0.828 | +0.828 | +0.831 | +0.838 | +0.847 | +0.857 | +0.869 | +0.881 |
| Other transportation equipment manufacturing | Millions of fixed (2024) Dollars | +0.121 | +0.121 | +0.123 | +0.125 | +0.128 | +0.131 | +0.135 | +0.139 |
| Furniture and related product manufacturing | Millions of fixed (2024) Dollars | +0.352 | +0.343 | +0.339 | +0.338 | +0.341 | +0.346 | +0.353 | +0.360 |
| Miscellaneous manufacturing | Millions of fixed (2024) Dollars | +0.036 | +0.024 | +0.017 | +0.013 | +0.012 | +0.013 | +0.015 | +0.017 |
| Food manufacturing | Millions of fixed (2024) Dollars | +1.896 | +1.903 | +1.919 | +1.939 | +1.963 | +1.988 | +2.013 | +2.034 |
| Beverage and tobacco manufacturing | Millions of fixed (2024) Dollars | +1.241 | +1.248 | +1.256 | +1.266 | +1.275 | +1.283 | +1.291 | +1.298 |
| Textile mills and textile product mills | Millions of fixed (2024) Dollars | +0.017 | +0.014 | +0.012 | +0.011 | +0.010 | +0.010 | +0.011 | +0.011 |
| Apparel, leather and allied product manufacturi | Millions of fixed (2024) Dollars | -0.036 | -0.037 | -0.037 | -0.036 | -0.034 | -0.032 | -0.030 | -0.027 |
| Paper manufacturing | Millions of fixed (2024) Dollars | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 |
| Printing and related support activities | Millions of fixed (2024) Dollars | +0.051 | +0.046 | +0.044 | +0.042 | +0.041 | +0.041 | +0.041 | +0.041 |
| Petroleum and coal products manufacturing | Millions of fixed (2024) Dollars | +9.282 | +8.781 | +8.415 | +8.158 | +7.976 | +7.843 | +7.746 | +7.667 |
| Chemical manufacturing | Millions of fixed (2024) Dollars | +0.070 | +0.060 | +0.054 | +0.049 | +0.047 | +0.045 | +0.044 | +0.044 |
| Plastics and rubber products manufacturing | Millions of fixed (2024) Dollars | +0.683 | +0.668 | +0.658 | +0.653 | +0.650 | +0.649 | +0.650 | +0.651 |
| Wholesale trade | Millions of fixed (2024) Dollars | +23.218 | +23.124 | +23.183 | +23.382 | +23.674 | +24.028 | +24.431 | +24.856 |
| Retail trade | Millions of fixed (2024) Dollars | +35.800 | +36.225 | +36.806 | +37.509 | +38.333 | +39.251 | +40.237 | +41.253 |

**MATS rulemaking impacts - By Age**

| | | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age | Units | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
| **All Ages (0-100)** | **Individuals** | **+477.798** | **+1304.930** | **+1939.678** | **+2440.929** | **+2825.319** | **+3117.124** | **+3338.788** | **+3510.243** | **+3647.479** |
| Ages 0-4 | Individuals | +48.782 | +132.680 | +195.930 | +244.700 | +281.046 | +303.413 | +315.601 | +324.460 | +330.517 |
| Ages 5-9 | Individuals | +37.323 | +102.959 | +155.311 | +198.400 | +232.772 | +263.912 | +291.507 | +311.761 | +326.801 |
| Ages 10-14 | Individuals | +29.739 | +82.160 | +124.247 | +159.317 | +188.144 | +211.970 | +232.086 | +249.665 | +265.438 |
| Ages 15-19 | Individuals | +31.186 | +80.948 | +112.861 | +135.841 | +154.243 | +170.951 | +186.234 | +200.032 | +213.026 |
| Ages 20-24 | Individuals | +75.320 | +197.616 | +273.714 | +313.070 | +320.743 | +306.793 | +283.134 | +258.859 | +238.780 |
| Ages 25-29 | Individuals | +68.886 | +190.243 | +286.964 | +365.786 | +426.212 | +467.322 | +486.890 | +484.519 | +462.466 |
| Ages 30-34 | Individuals | +50.312 | +140.072 | +214.357 | +278.601 | +333.557 | +380.159 | +419.903 | +454.296 | +484.061 |
| Ages 35-39 | Individuals | +37.475 | +103.620 | +157.157 | +202.680 | +241.445 | +275.204 | +305.804 | +334.896 | +363.577 |
| Ages 40-44 | Individuals | +32.781 | +89.958 | +134.483 | +169.886 | +197.289 | +218.856 | +237.068 | +253.975 | +270.779 |
| Ages 45-49 | Individuals | +23.849 | +66.353 | +101.443 | +131.716 | +157.580 | +179.601 | +197.896 | +212.720 | +224.763 |
| Ages 50-54 | Individuals | +17.691 | +49.024 | +74.501 | +96.083 | +114.281 | +129.943 | +144.031 | +157.396 | +170.555 |
| Ages 55-59 | Individuals | +13.068 | +35.960 | +54.267 | +69.819 | +83.131 | +94.780 | +105.134 | +114.568 | +123.502 |
| Ages 60-64 | Individuals | +11.388 | +31.537 | +47.603 | +60.392 | +69.926 | +76.759 | +82.038 | +86.863 | +91.823 |
| Ages 65-69 | Individuals | +0.000 | +1.800 | +6.840 | +14.637 | +24.950 | +37.460 | +49.785 | +59.870 | +67.794 |
| Ages 70-74 | Individuals | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | +1.677 | +6.363 | +13.595 |
| Ages 75-79 | Individuals | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | +0.000 | 0.000 |
| Ages 80-84 | Individuals | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Ages 85+ | Individuals | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Category: Montana - Race: Population - Gender: All Races - Comparison Type: Total - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

**MATS rulemaking impacts - By Age**

| Age | Units | Year 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
|---|---|---|---|---|---|---|---|---|---|---|
| **All Ages (0-100)** | **Individuals** | **+3761.717** | **+3860.652** | **+3949.665** | **+4031.275** | **+4106.385** | **+4175.468** | **+4238.252** | **+4293.884** | **+4341.941** |
| Ages 0-4 | Individuals | +334.326 | +336.155 | +336.132 | +334.221 | +330.291 | +324.305 | +316.250 | +306.210 | +294.485 |
| Ages 5-9 | Individuals | +338.182 | +342.842 | +343.019 | +343.982 | +344.892 | +345.324 | +344.816 | +342.919 | +339.298 |
| Ages 10-14 | Individuals | +279.579 | +296.349 | +314.185 | +328.019 | +338.870 | +347.500 | +350.259 | +348.914 | +348.488 |
| Ages 15-19 | Individuals | +225.572 | +237.876 | +250.191 | +262.640 | +275.049 | +286.966 | +302.168 | +318.711 | +331.349 |
| Ages 20-24 | Individuals | +225.872 | +220.707 | +221.341 | +225.569 | +232.288 | +240.612 | +249.845 | +259.546 | +269.490 |
| Ages 25-29 | Individuals | +424.819 | +378.817 | +333.478 | +294.996 | +265.674 | +246.704 | +237.312 | +234.520 | +235.591 |
| Ages 30-34 | Individuals | +508.109 | +523.400 | +525.479 | +511.685 | +482.306 | +439.961 | +390.824 | +343.025 | +302.288 |
| Ages 35-39 | Individuals | +392.130 | +419.943 | +446.903 | +472.853 | +497.101 | +517.533 | +530.351 | +530.522 | +515.074 |
| Ages 40-44 | Individuals | +288.286 | +306.933 | +327.244 | +349.527 | +373.706 | +399.251 | +424.931 | +450.148 | +474.507 |
| Ages 45-49 | Individuals | +234.845 | +244.086 | +253.908 | +265.253 | +278.391 | +293.433 | +310.336 | +329.216 | +350.165 |
| Ages 50-54 | Individuals | +183.693 | +196.633 | +208.718 | +219.434 | +228.779 | +237.077 | +245.085 | +253.883 | +264.265 |
| Ages 55-59 | Individuals | +132.280 | +141.190 | +150.627 | +160.849 | +171.876 | +183.531 | +195.372 | +206.559 | +216.472 |
| Ages 60-64 | Individuals | +97.248 | +103.240 | +109.678 | +116.454 | +123.570 | +131.062 | +138.996 | +147.583 | +156.985 |
| Ages 65-69 | Individuals | +73.649 | +77.834 | +81.277 | +84.836 | +88.895 | +93.651 | +99.096 | +105.045 | +111.354 |
| Ages 70-74 | Individuals | +23.127 | +34.648 | +45.976 | +55.245 | +62.534 | +67.933 | +71.826 | +75.057 | +78.407 |
| Ages 75-79 | Individuals | 0.000 | 0.000 | +1.509 | +5.712 | +12.164 | +20.624 | +30.784 | +40.748 | +48.903 |
| Ages 80-84 | Individuals | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | +1.277 | +4.819 |
| Ages 85+ | Individuals | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

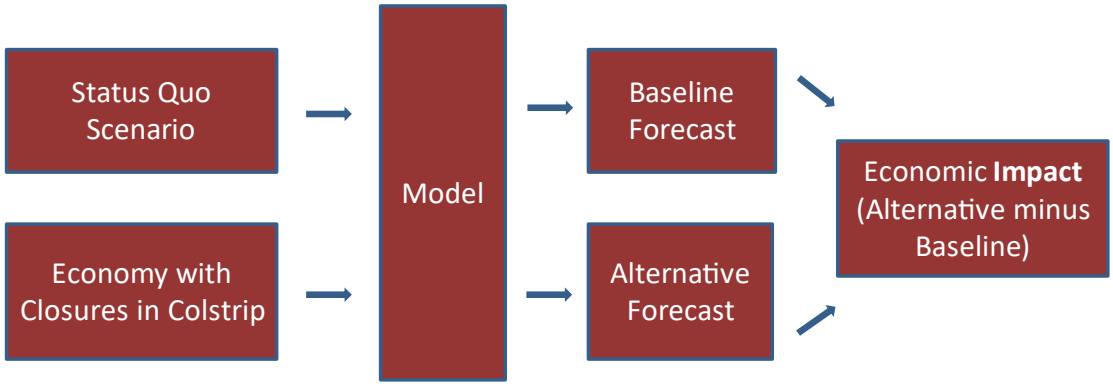
**Category: Montana - Race: Population - Gender: All Races - Comparison Type: Total - Forecast: Differences - Comparison Forecast: MATS rulemaking impacts**

# Appendix B
# Description of the REMI Model

## The REMI Modeling Methodology

The basic approach of using the REMI model to produce the results for this study is illustrated in Figure B.3, below. The analysis started with a baseline projection for the Montana economy, where the Colstrip SES and Rosebud Mine are present. Next, the analysis employed the REMI model a second time, simulating an alternative scenario where the two facilities are closed and their associated economic activity are absent from the Montana economy.

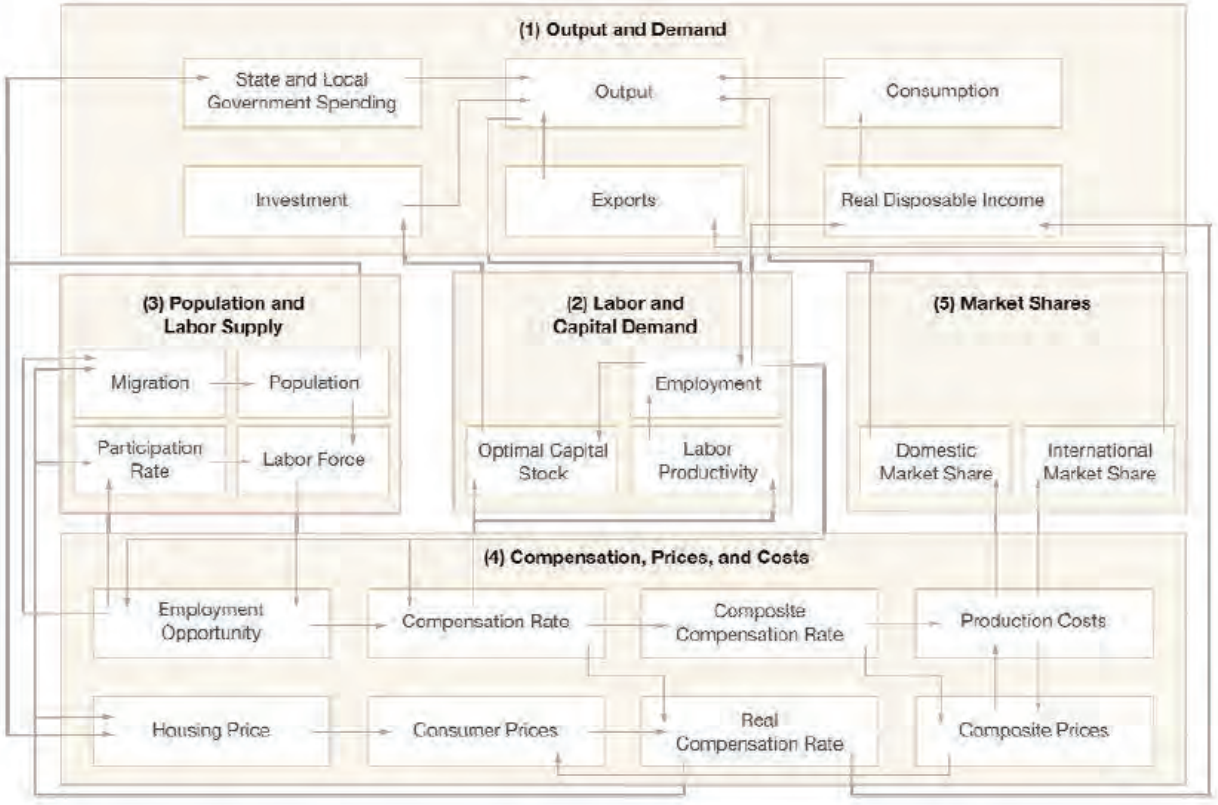
*Figure B.3. Policy Analysis Using the REMI Model*




The difference between the two economic projections represents the economic impact of MATS-induced rulemaking in Montana.

The REMI model utilizes historical data on production, prices, trade flows, migration, and technological advances to calibrate the relationship between five basic blocks of the state economy: 1) Output and Demand; 2) Labor and Capital Demand; 3) Population and Labor Supply; 4) Compensation, Prices and Costs; and 5) Market Shares. These linkages are shown in Figure B.4, below.

Figure B.4. Schematic Model of REMI Linkages



The differences in production, labor demand, and intermediate demand associated with the closure of the Colstrip SES and the Rosebud Mine impact these blocks, causing them to react to the changes and adjust to a new equilibrium. This new equilibrium constitutes the alternative scenario referred to above—the closure of the facilities.

The underlying philosophy of the REMI model is that regions throughout the country compete for investments, jobs, and people. When events occur in one region, they set off a chain reaction of events across the country that causes dollars to flow toward better investment and production opportunities, followed over time by workers and households toward better employment opportunities and higher wages.

The REMI model consists of an 70-sector input/output matrix that models the technological inter-dependence of production sectors of the economy, as well as extensive trade and capital flow data. Together, these components enable the estimates of the shares of each sector's demand that can be met by local production. Simplified illustrations of the schematic model in Figure B.4 are provided on the following pages, in figures B.3 through B.7.

Figure B.5. Output Linkages

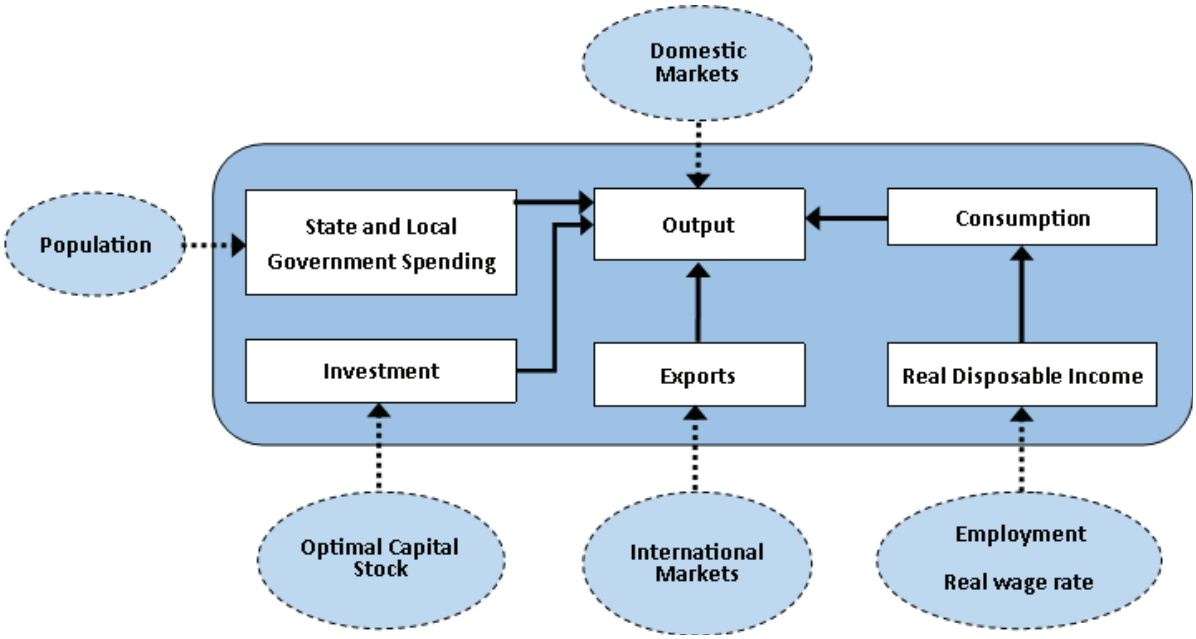


Figure B.6. Labor and Capital Demand Linkages

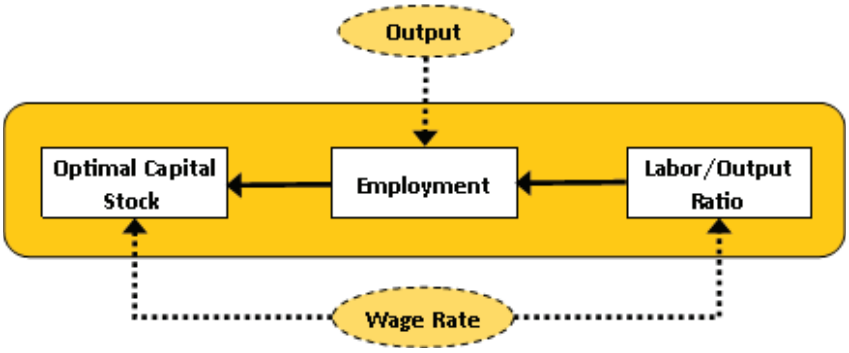



Figure B.7. Demographic Linkages

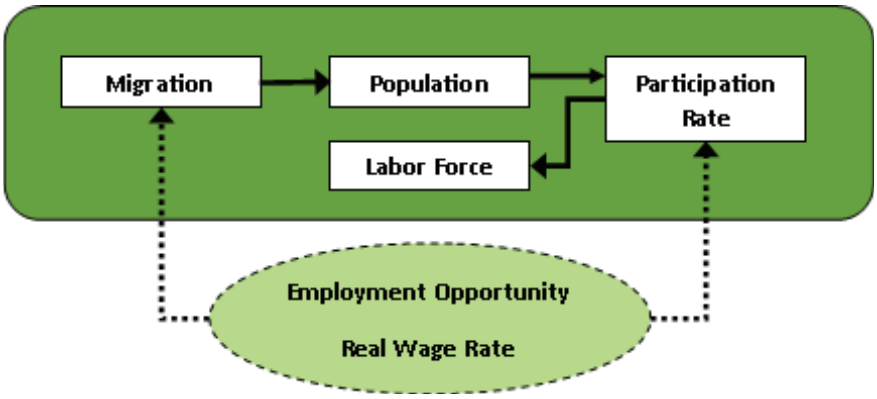


Figure B.8. Wages, Prices and Production Costs Linkages

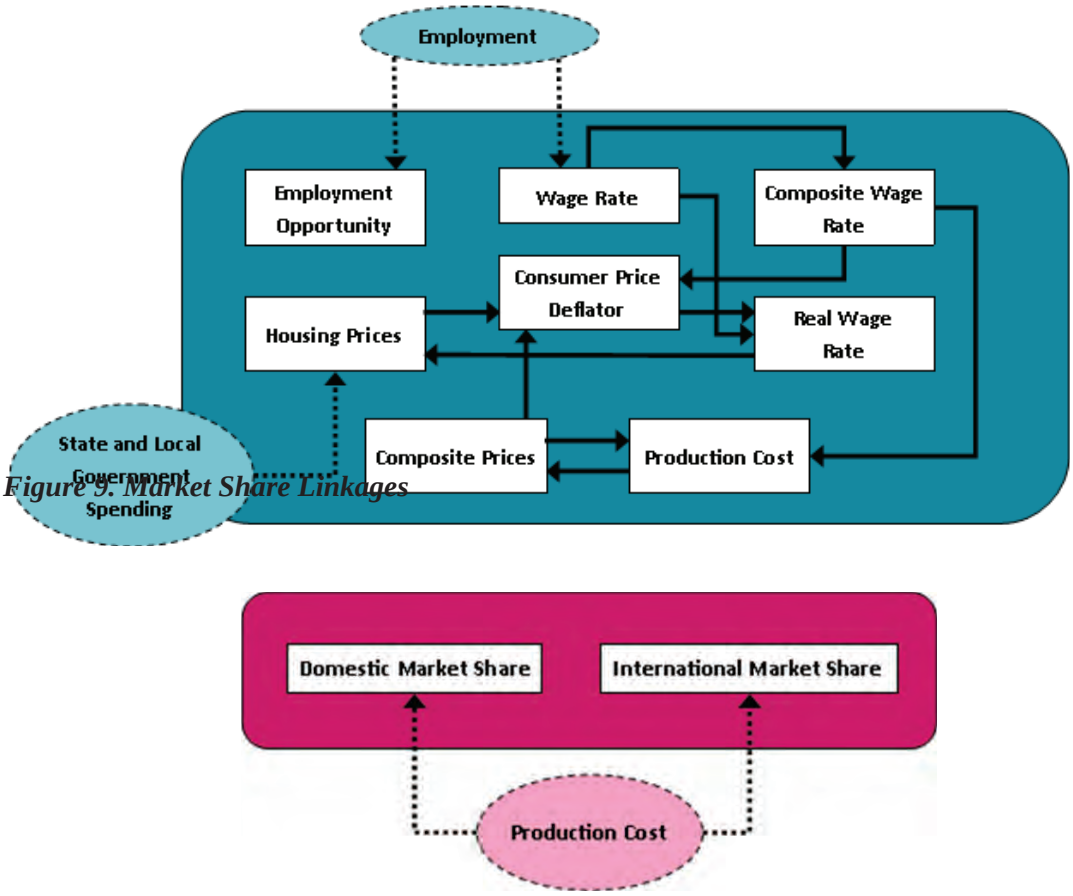



*Figure 9. Market Share Linkages*

As powerful and flexible as this tool is, the output it provides is only as good as the inputs provided. The majority of the work for this study was to carefully craft the inputs used to construct a scenario for the economy that faithfully represents all of the events, income flows, and the direct and indirect activity that would occur in the event that the Colstrip SES and the Rosebud Mine were closed in mid-2027.