

***Exaggerating Exaggerations:
NorthWestern Energy's Projections of the Montana Impacts
of Compliance with EPA's Clean Power Plan***

A Review by

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Summary

The analysis provided in this report supports the following conclusions about NorthWest Energy's (NWE's) claims that the implementation of EPA Clean Power Plan (CPP) that limits the carbon pollution from existing fossil-fueled electric generators in Montana would have major negative impacts on the Montana economy:

- A. NWE's claim that the complete shutdown of the Colstrip electric generating facilities and supporting transmission line and coal mine will be required in 2022 for Montana to comply with the CPP is implausible. It is tied to a "domino theory" of cascading events that ignores the flexibility built into the CPP to facilitate state compliance at a minimum cost.
- B. Because NWE's imagines an implausible worst case scenario, the impacts of the CPP on the Montana economy projected by NWE's consultants are also implausibly high.
- C. NWE's projected economic impacts are stated in a way that exaggerates the apparent size of the economic impacts on Montana of complying with the CPP. Those exaggerations flow from the following:
 - i. The economic "losses" projected by NWE represent a slight *slowdown in the growth* of the economy not a *decline* in the economy.
 - ii. The projected economic "losses" (thousands of jobs and residents and hundreds of millions of dollars in lost income and labor earnings) are not placed in a context so that their relative importance can be evaluated. The projected impacts actually represent a fraction of one percent of where the Montana economy otherwise would have been or, at most, about one percent.
 - iii. The projected ongoing growth in the Montana economy, even under NWE's dire CPP compliance scenario, would offset the projected "losses" of personal income and labor earnings in about 6 months.
 - iv. Despite NWE's projected dire impacts of the CPP on Montana's electric infrastructure, both the common measure of job quality (real pay per job) and the common measure of economic well-being (real per capita income) are projected by NWE to be largely unaffected by implementing the CPP in Montana.
- D. We conclude that Montana can comply with the CPP without threatening either the reliability of the Montana electric infrastructure or the economic well-being of the state's residents, workers, and businesses.

1. NorthWestern Energy's Dire Scenario for Montana Compliance with the EPA's Clean Power Plan

In order to make a case in federal court for a temporary suspension of EPA's regulation of the carbon pollution from existing electric generators, NorthWestern Energy (NWE) needed to demonstrate to the court that significant and irreversible harm would be done

while the courts pondered the ultimate legality of EPA’s Clean Power Plan (CPP). To do that NWE crafted a scenario under which the CPP would force: i. all four Colstrip (CS) power plants to shut down by 2022; ii. the closing of the coal mine supplying those generating units; iii. the abandonment of the Colstrip power line that carries electric power across most of the length of Montana, and; iv NWE to build a large new natural gas fueled electric generator in Eastern Montana along with new electric transmission lines and natural gas pipe lines. All of this would, NWE argued, force the cost of electricity to Montana households, businesses, and industries significantly upward. This in turn would slow economic development in Montana even more.

NWE hired the Bureau of Business and Economic Research (BBER) at the University of Montana to estimate the economic impact of this NWE scenario of a dramatically changed electric infrastructure serving Montana. BBER concluded that NWE’s hypothesized worst case scenario would have significant negative economic impacts on the state:

- This change in the electrical infrastructure of the state would be “the most significant economic event to occur in Montana in more than thirty years...” (p. 1)
- The impact on Montanans’ incomes would be “roughly half as large as the decline in personal income Montana experienced in the Great Recession in 2009.” (p. 6)
- “The loss of jobs and job opportunities from implementation of [EPA’s CPP] in Montana results in working age people leaving the state, taking their children and future children with them...The population declines due to [EPA’s CPP] peak at over 10,700 people overall...” (p. 6)

In particular BBER projected the “loss” of over 7,000 jobs, almost 11,000 residents, and \$556 million in income to Montanans. See Table 1 below.

Table 1

NWE/BBER Economic Impacts of Implementing EPA's CPP in Montana				
Type of Economic Impact	Units	BBER Projected Impacts by Year		
		2025	2035	2045
Total Employment	jobs	-7,137	-5,381	-3,715
Personal Income	\$millions	-\$515.9	-\$556.3	-\$482.2
Disposable Personal Income	\$millions	-\$440.6	-\$481.2	-\$417.7
Population	people	-5,211	-10,731	-9,207
"The Economic Implications of Implementing the EPA Clean Power Plan in Montana, Preliminary Draft"				
A report prepared for NorthWestern Energy by UM BBER, November 2015. Executive Summary				
Table on p. 3: "Impacts Summary"				

NWE has asserted and BBER has confirmed that it was NWE that gave BBER the particular physical impacts that compliance with the CPP regulations would have on

Montana's energy infrastructure. BBER's role was to then calculate the impacts on the Montana economy if NWE's compliance scenario was in fact the least cost response adopted by Montana to meet the CPP's mandates. That is, as BBER has put it, its job was to answer a "What if?" economic question, not to make a projection about what the CPP would require Montana to do to comply with that federal mandate. Unfortunately that is not how the BBER's report was written or, even, how the report was titled.

NWE developed the "required" Montana CPP compliance scenario through the use of a domino theory of cascading consequences that get more dire as they go along. It starts with the false assumption that only shutting down parts of the Colstrip coal-fired electric generators will meet the CPP's carbon pollution reduction goals. Since just shutting down Colstrip 1 and 2 would not reach the 2030 carbon pollution limits, NWE assumes that there would have to be less electric generation at Colstrip 3. But that would make Colstrip 3 uneconomic to run at all. Without Colstrip 3 running, Colstrip 4 would not be viable. Presto: The entire Colstrip complex would have to close by 2022 along with its associated coal mine.

But, according to NWE there are still more dominos to fall: With the shutdown of all of the generators, the 500 kV Colstrip transmission line would cease to be functional and would be abandoned. That would make it difficult for large industrial and commercial operations in Montana to import the electricity they need. Costly new electric generation plants and transmission lines would have to be built. Electric rates for businesses in Montana would skyrocket, putting them at a competitive disadvantage and economic development in Montana would slow. And the economic dominos would keep on falling.

There are many reasons to be skeptical of this hypothesized Montana economic death spiral:

- NWE owns only about 10 percent of the capacity of the Colstrip plants. The other 90 percent owners are not making these claims. Nor are they suing EPA to stop the national effort to reduce carbon pollution.
- EPA's carbon control regulations do not mandate anything about the Colstrip plants. EPA has set a cap on the carbon pollution coming from *all* existing fossil-fueled electric generators and asked states to come up with plans to meet their target reductions in the least cost and socially most acceptable manner as seen by the states themselves.
- Among the carbon pollution reduction measures Montana could choose to adopt are energy efficiency improvements at the generators and in customers' use of electricity, adding more low or zero carbon renewable generation, and purchasing available emissions allowances.
- The State of Montana is tasked with the job of putting together a plan to reach its assigned carbon pollution reduction target. A state government working group has been established to help the State of Montana to produce its CPP compliance plan. NWE does not know what the Montana plan will contain.
- The shutdown of the dirtiest and least efficient coal-fired generators in Montana can also contribute to meeting the carbon reduction target. Colstrip 1 and 2 as well as the Lewis and Clark generator at Sidney are already being considered for

retirement for reasons unrelated to the Clean Power Plan, just as the old Corette plant in Billings was recently retired.

- There are eight Montana coal-fueled electric generation units subject to the CPP, not just the four at Colstrip. To the extent that Montana plans to meet some of its assigned carbon pollution reductions by shutting down some of the older, dirtier, and less efficient electric generators, there is a broader group of plants that could contribute to that.
- NWE appears to confuse the carbon pollution emission reductions required in 2030 with that required in 2022. In order to comply with the 2022 requirements of the CPP, there would be no need to back down electric generation at either Colstrip 3 or 4.
- Because most of the Western states have carbon control targets that can easily be met, regional electric utility organization projections are that there will be an abundance of carbon emission allowances available for purchase relatively cheaply by the few Western states, like Montana, that have more challenging carbon reduction targets. The CPP envisions groups of states using this mechanism to reduce the regional cost of meeting the requirements of CPP.
- Almost almost 64 percent of the capacity of the Colstrip generators is owned by utilities in Washington and Oregon. These states are expected to have more carbon emission allowances than they need to meet their CPP emissions reduction targets. This presents a clear opportunity for mutually beneficial market exchanges in emissions allowances among the Pacific Northwest states, including Montana, that have an interest in the Colstrip generating units .

For the above reasons, we do not believe that NWE's CPP compliance scenario is anywhere close to what will be contained in the State of Montana's compliance plan. That means that the BBER's estimated economic impacts are also gross overestimates of the economic costs of compliance.

It is also important to recognize that an analysis that ignores the benefits of reduced carbon pollution and a stabilized climate and focuses only on the costs of pursuing those benefits is not an economic analysis since benefits and costs are not weighed and *net* benefits or *net* costs are not estimated.

2. The Organization of this Report

In the rest of this report, we will use the results of NWE's worst case analysis and the Montana economic impacts estimated by BBER based on that NWE compliance scenario and comment on what the economic implications of these exaggerated negative results would be. The way in which economic impacts are stated can sometimes be misleading. We seek to clarify the economic meaning of the projected impacts, leaving aside the question of the accuracy of the assumed near-term impact of the CPP on Montana's Colstrip power plants, coal mine, transmission line, and electricity costs.

We will also focus on statewide impacts since most of the public discussion of NWE's scenario of what it will take to comply with the CPP has emphasized impacts on Montana as a whole. The BBER report did emphasize the fact the City of Colstrip, Rosebud County, and Eastern Montana would feel the projected economic impacts much more intensely than most of the rest of the state. But the BBER's summary of the economic impacts emphasized the state as a whole where, of course, the estimated impacts are large, albeit less intense, than local ones. It should be kept in mind, however, that the fact that the Montana economy may be able to digest this economic adjustment relatively easily does not mean that there will not be people, families, communities, and businesses that will face costly and painful adjustments.

Good public policy, however, would focus on assisting those hit hardest by economic shocks to make productive adjustments. In a regional economy overly dependent on a single natural resource sector, public policy that seeks to maintain the status quo in the face of regular expansions and contractions in commodity markets and the economic environment in which they have to operate is rarely possible and often not desirable.

Colstrip, Montana, for example, has had to cope with severe swings in population and economic activity several times over the last half-century. In 1980 Colstrip's population was a little larger than it was in 2014, 2,500 vs. 2,300. But in between those two dates the population swelled to 8,000 when the construction workforce for Colstrip 3 and 4 and the associated coal mine reached its peak in the mid-1980s. By 1991, with the construction of the four generating units completed and all of the generating units operating, the population had fallen to 4,500. Labor saving technological change and business streamlining by the owners and manager of the Colstrip electric generation complex led to ongoing declines in Colstrip's population throughout the 1990s. By 2000, the population had stabilized at about its current level of 2,300.¹

The Bakken oil fields provide another example of the difficult adjustments that Montana communities, residents and workers have to make as commodity markets shift and ultimately mineral deposits are depleted. This is the second oil and gas boom and bust for eastern Montana and western North Dakota.

Of course, it is not only Eastern Montana that has had to make adjustments to the fluctuation fortunes of its natural resource industries: Butte, Anaconda, and Great Falls had to adjust to the loss of the Anaconda Copper mining and smelting operations. Missoula had to adjust to the shutdown of a large pulp and paper board mill, a plywood mill, and several lumber mills. Columbia Falls and the Flathead Valley saw the shutdown of a large aluminum smelter as well as forest product operations. Across Montana many other mining and wood products operations have shut down. This is not a problem unique to Montana. Most of the Mountain West has had to make the same adjustments.

¹ Colstrip was incorporated as a city in 1997. It was a Census Designated Place in 1990 but the Census place boundaries and the city boundaries do not coincide. So it is not easy to accurately say what the Colstrip population was in any given year since the geographic boundaries changed. The Colstrip population numbers provided here come from the City of Colstrip Comprehensive Growth Policy 2008," pages 10 and 13. <http://comdev.mt.gov/content/CTAP/docs/GrowthPolicies/Colstrip.pdf>

Neither booms nor the busts are very pretty from either a social or economic perspective. Short of forbidding over reliance on particular commodity extraction activities or the deployment of labor-saving technologies to reduce costs, it is not clear that public policy can do more than assist workers, families, and communities as they weather the booms and cope with the busts. The fact that the current concern about the Colstrip area is tied to federal policy that seeks to reduce carbon pollution and help stabilize global climate does not make it different from other cost and price driven commodity cycles of the past and present. That carbon pollution will have very real and substantial costs to the Montana, national, and world economies. Only if one denies that carbon pollution represents a serious threat to climate stability can the public policy recognizing those climate change costs be dismissed as “uneconomic” solely on the basis of an analysis of the costs associated with implementing carbon pollution reduction policies..

3. Slower economic *growth* versus economic *loss*

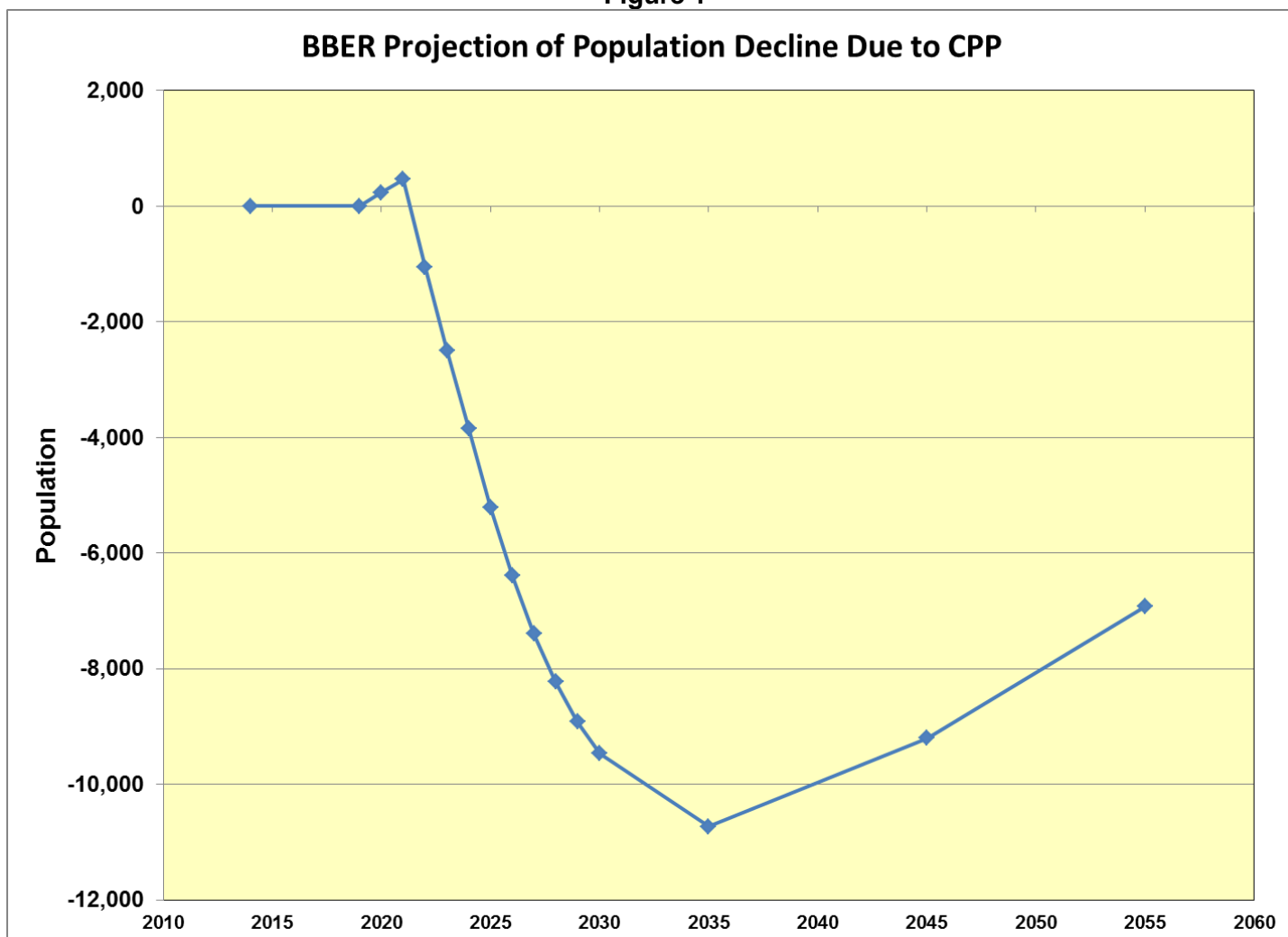
The BBER presents the CPP’s negative economic impacts as economic *losses*. As quoted above, BBER states that Montana will face population “declines,” peaking at about 11,000 persons. This population “loss” is depicted in terms of people being forced to leave the state with children in hand. That, however, is not what BBER’s modeling actually projects. BBER’s modeling projects two future scenarios: One is a baseline case, business-as-usual, no major changes from current expectations. That baseline case projects ongoing economic growth. The second projection of the future incorporates the economic impacts of NWE’s worst case CPP scenario. It projects a *slower growing* economy. When one scenario is subtracted from the other, the difference in the *level of growth* is used to represent the “loss” relative to what would have been true if the rate of *growth* had not *slowed*. That is, the economy does not turn down, experiencing negative growth. Instead employment, population, and real income continue to grow, just not as fast.

Figure 1 below shows the population “decline” that the BBER is concerned about. As mentioned above, the BBER described this population “loss” in emotional terms:²

The loss of jobs and job opportunities from implementation of [EPA’s CPP] in Montana results in working age people leaving the state, taking their children and future children with them...The population declines due to [EPA’s CPP] peak at over 10, 700 people overall...”
(p. 6)

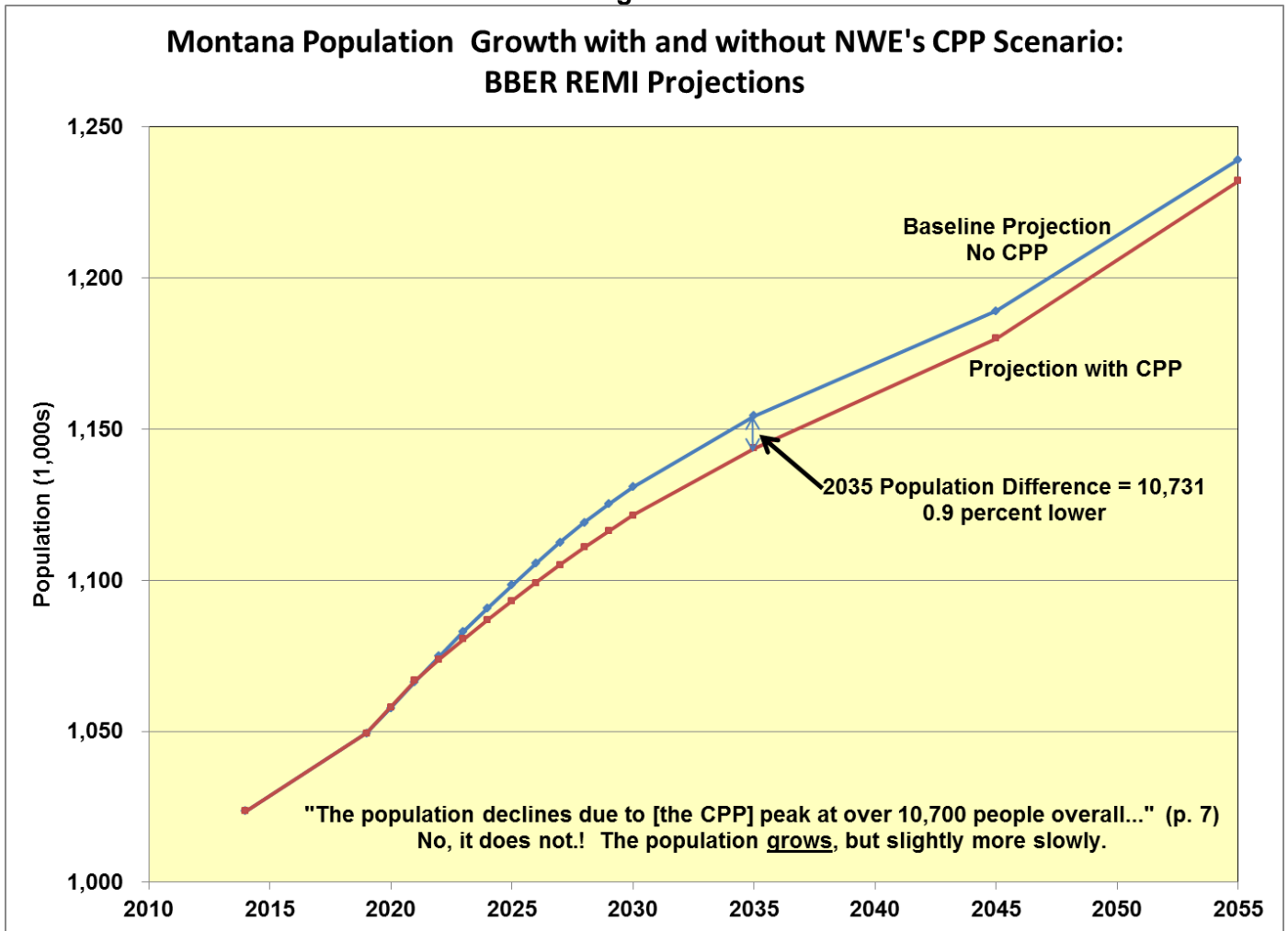
² Figure 1 is similar to the BBER Figure 4.1 that showed “Employment Impacts.” Because BBER’s baseline employment projections appear to contain an error, we have applied the BBER approach to population instead.

Figure 1



If, instead of looking at the change in population in this way, we look at the levels of population the BBER actually projected, the “loss” of population disappears. This is shown in Figure 2 below. Figure 2 shows BBER’s baseline projection that assumes that the CPP never takes effect. It also shows BBER’s projection of population trends associated with NWE’s projection of the 2022 abandonment of the four Colstrip electric generators, coal mining, and 500 kV transmission line.

Figure 2

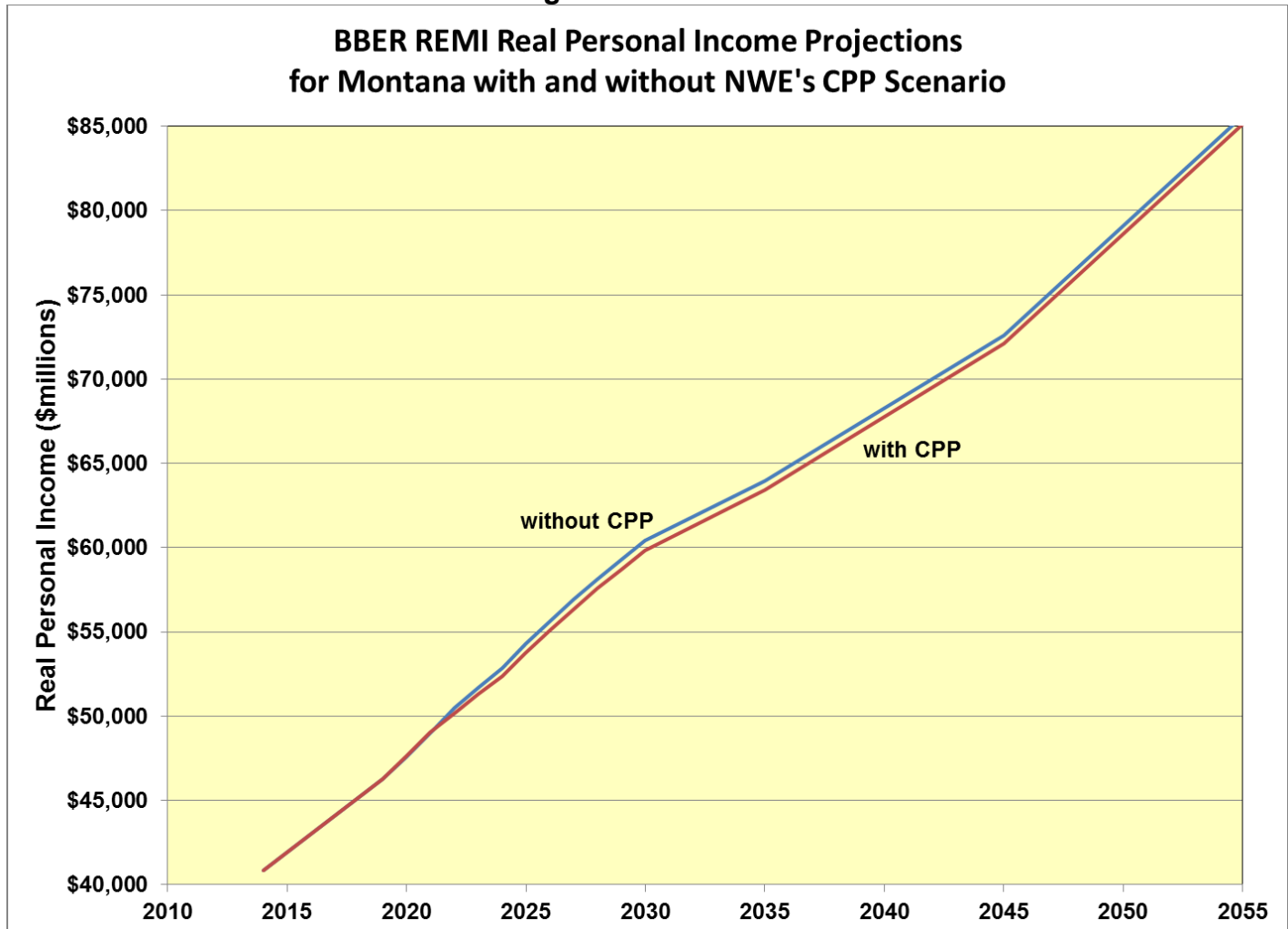


BBER's projected "loss" of 10,700 people from the population is the vertical distance between the two growth curves in the later years. Note that the population line which reflects the assumed closing of all of the Colstrip facilities and the projected economic consequences never dips downwards; population never declines. Also note that this figure represents a "magnification" of the impact so that it is more visible. The vertical population axis begins at one million instead of zero.

If one compares the BBER REMI projected economic impacts of NWE's worst case scenario for almost any of the measures of economic performance with the BBER REMI baseline projection of the Montana economy under "business as usual" assumptions, the results are similar to Figure 2 above: BBER is not projecting a downturn in the Montana economy but the continued expansion of the Montana economy at a slightly slower rate. Figure 3 below shows this for total real personal income received by Montanans with and without the implementation of NWE's worst case scenario. Again

note that the impact has been “magnified” by beginning the vertical real income axis at \$40 billion rather than zero.

Figure 3



4. How Big Is It? Putting Projected Impacts in Context

How important is an employment level that is 7,000 lower than it might have been in any given year? How important is a state population that is 11,000 smaller than it might have been? A flow of income to Montana households that is a half-billion dollars smaller sounds huge. How is one to judge the relative importance of such differences in projected future economic magnitudes?

One way, of course, is to simply state them in percentage terms, that is, state their size in the context of the economy you are seeking to describe. If we do that, the 7,100 lower

level of employment in the BBER’s CPP projections in 2025 represent about one percent of total employment. The 3,700 lower employment level in 2045 represents about one-third of one percent of all Montana jobs that BBER calculates otherwise would have existed. Clearly this does not represent a serious collapse of the economy. When the BBER’s worst case projected impacts are put in the context of the overall economy that BBER projections would have existed if not for NWE’s worst case scenario implementation of the CPP, all of the impacts are about one percent or a fraction of one percent. Clearly the Montana economy will not suffer a serious “collapse.” See Table 2 below.

Table 2

Size of BBER CPP Impact as a Per Cent of the Economy			
Economic Measure	Value in		
	2025	2035	2045
Real Income (\$millions)	\$54,315	\$63,970	\$72,601
Real Labor Earnings (\$millions)	\$34,228	\$39,387	\$44,388
Population	1,098,276	1,154,411	1,189,117
Jobs*	746,058	815,603	833,615
	BBER Change Due to CPP		
	2025	2035	2045
Real Income (\$millions)	(\$516)	(\$556)	(\$482)
Real Labor Earnings (\$millions)	(\$469)	(\$399)	(\$297)
Population	(5,211)	(10,731)	(9,206)
Jobs*	(7,137)	(5,381)	(3,714)
	Change as a Percent of the Economy		
	2025	2035	2045
Real Income (\$millions)	-0.9%	-0.9%	-0.7%
Real Labor Earnings (\$millions)	-1.4%	-1.0%	-0.7%
Population	-0.5%	-0.9%	-0.8%
Jobs*	-1.0%	-0.7%	-0.4%
*There appears to be an error in BBER's baseline job projection.			
This estimate is based on the BBER jobs growth in 2014-2019 and 2030-2055.			

Another way of putting these lower rates of economic growth in context is to ask how many month of expected economic growth would be needed to offset or eliminate them. That is, how many months of no growth in the economy does this slower growth represent. If it takes just a few months of normal economic expansion to offset the “losses” associated with slightly slower growth, that change should not be judged to be seriously disruptive in the sense that it is something we regularly experience in the normal ebb and flow of the economy.

The slower growth that BBER projects for real labor earnings and personal income would be made up by 5 to 9 months of ongoing economic growth. Because BBER’s

REMI model projects extremely slow growth in both jobs and population after 2025 even if the CPP is abandoned and never takes effect, it takes considerably longer periods of that slow growth to off-set the “losses”: two to three years. See Table 3 below.

Table 3

Number of Months of Growth to Offset BBER Projected "Losses"			
Economic Measure	BBER Annual Growth with CPP		
	2025	2035	2045
Real Income (\$millions)	\$1,322	\$871	\$1,303
Real Labor Earnings (\$millions)	\$622	\$510	\$717
Population	6,038	3,623	5,221
Jobs*	10,124	1,968	1,923
	BBER Annual Change Due to CPP		
	2025	2035	2045
Real Income (\$millions)	-\$516	-\$556	-\$482
Real Labor Earnings (\$millions)	-\$469	-\$399	-\$297
Population	-5,211	-10,731	-9,206
Jobs*	-7,137	-5,381	-3,714
	Number of Months of Growth to Offset		
	2025	2035	2045
Real Income (\$millions)	5	8	4
Real Labor Earnings (\$millions)	9	9	5
Population	10	36	21
Jobs*	8	33	23
*There appears to be an error in BBER's baseline jobs projection.			
This estimate is based on the BBER job growth 2014-2019 and 2030-2055			

5. BBER’s Projection of the Impact of CPP on Average Income and Pay

The REMI Model that BBER used to project the economic impacts of the worst case scenario of compliance with the CPP that NWE imagined also provides projections that allow us to estimate what will happen to average real pay and income in future years, with and without the implementation of the CPP. Pay per job and per capita income are often used by BBER and others to indicate the average quality of the jobs that workers face and the average economic well-being of residents of Montana.

The REMI projections with and without implementation of NWE’s worst case scenario, the complete shutdown of the Colstrip complex by 2022, shows both average real income and average pay per job continuing to increase over the BBER study period, 2019-2055. The cascading negative consequences predicted by NWE appear to have no measurable impact on these indicators of job quality and economic well-being. If they are graphed beside one another, the projected future values are almost identical regardless of whether NWE’s “catastrophic” projections come true. See Table 4 below.

Table 4

BBER's Projections of the Impact of the CPP on Real Average Income and Pay in Montana							
	2014	2020	2025	2030	2035	2045	2055
Real Per Capita Income <i>without</i> CPP	\$39,903	\$45,012	\$49,455	\$53,409	\$55,413	\$61,055	\$69,092
Real Per Capita Income <i>with</i> CPP	\$39,903	\$45,052	\$49,219	\$53,342	\$55,447	\$61,122	\$69,108
% Change in Per Capita Income Due to CPP	0.0%	0.1%	-0.5%	-0.1%	0.1%	0.1%	0.0%
Real Pay per Job <i>without</i> CPP	\$42,844	\$44,509	\$49,240	\$53,991	\$55,949	\$60,395	\$66,765
Real Pay per Job <i>with</i> CPP	\$42,844	\$44,531	\$49,068	\$53,814	\$55,808	\$60,296	\$66,676
% Change in Pay per Job Due to CPP	0.0%	0.1%	-0.3%	-0.3%	-0.3%	-0.2%	-0.1%

Note: Per capita income is total personal income divided by the population. Average pay per job is total labor earnings divided by the total number of jobs.

The largest impact of the CPP on per capita income is about one-half of one percent in 2025. For average pay per job the largest impact is about one-third of one percent in the same year. For most years the impact is closer to one-tenth of one percent. Clearly NWE's worst case scenario does not derail Montana's economic development in any sense.

6. Appendix: Methods and Data

BBER calculated the impacts associated with NWE's worst case scenario by projecting how the Montana economy would perform between 2019 and 2055 given current trends. Then the "shock" of NWE's assumed shutdown of the Colstrip electric generators, coal mine, and associated transmission line and higher electricity costs in Montana were added to the economic model, and a new trajectory for the Montana economy was calculated. The differences between these two alternative economic futures for the Montana economy were the economic impacts that BBER calculated.

The appendix to the BBER report provides the "baseline forecast" of various economic indicators for a study period of 2019 through 2055. This is the "business as usual" projection of how the Montana economy would develop if the Clean Power Plan is not implemented. The appendix also provides an "Alternative Forecast" for the same economic indicators. The difference between these two forecasts, the Baseline minus the Alternative, is the source of the BBER's estimated "losses" associated with the implementation of the CPP. BBER focuses on jobs, population, income, gross state product, the value of total economic output, and tax payments to state and local governments.

We used BBER's results for all of our analysis with one exception. BBER's baseline forecast of employment has job creation in Montana stagnate and then decline between 2022 and 2030. Keep in mind that this is the forecast that assumes that the CPP is not implemented. It is not obvious what would cause such an almost decade-long job recession in Montana. While job creation is projected to stagnate and decline in the

2020s by BBER even without the CPP, population, real labor earnings, total personal income, gross state product, per capital income, and pay per job all are forecast by BBER to continue growing.

One could speculate what might cause such stagnation in job growth: Separate and apart from the CPP, we know that the Colstrip generating units are aging and at some point *will* be retired. We also know that the coal industry is facing stiff competition from natural gas and renewable energy sources. Several major coal companies are close to filing or have filed for bankruptcy protection. Coal production in the Powder River Basin may have passed its peak level of production and be in decline. Finally, even before oil prices plummeted by fifty percent, petroleum engineers were plotting the likely life cycle of the Bakken oilfield production, both its expansion and its ultimate contraction. That, too, has implications for future population levels in Eastern Montana. See, for instance “Eastern Montana County Level Population Projections, “ Joe Ramler, Census & Economic Information Center, Montana Department of Commerce, April 2013. (http://ceic.mt.gov/Documents/PopulationProjections/MT_County_Population_Projections_eREMI_and_MDT_Merging_Methodology.pdf)

It seems premature to be forecasting such impacts beginning as soon as a half-decade from now, especially when none of the other simultaneously forecasted economic indicators reveal similar economic stagnation. We therefore assumed that the baseline forecast had an error in it. We used the 2014-2019 and the 2030-2055 BBER forecasted rates of job growth to create a different baseline forecast from which the implementation of the BBER’s forecasted impacts of the CPP would cause slower job growth. The job growth rates indicated by the BBER job baseline job forecast was quite modest: 1.35 percent per year for 2014-2019 and 0.44 percent per year for 2031-2055. Actual job growth between 1985 and 2014 in Montana was 1.5 percent per year.