

The Economic Effects of the New EPA Rules on the State of Wisconsin

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Executive Summary

New electricity regulations being proposed by the Environmental Protection Agency (EPA) would have devastating effects on the U.S. economy, but would be even more detrimental to Wisconsin's families and businesses.

According to this joint study published by The Beacon Hill Institute at Suffolk University and The John K. MacIver Institute for Public Policy, the EPA's proposed Clean Power Plan would cost Wisconsin \$920 million in 2030, increase electricity prices significantly and lower disposable income in the state by nearly \$2 billion.

The EPA's proposed rules, which are expected to go into effect in summer of 2015, aim to limit carbon emissions from coal-fired electricity power plants by cutting the allowable amount of emissions by more than half. The rules would force utilities to close coal-fired plants in Wisconsin or adopt expensive and unproven technologies, such as carbon capture and storage.

If the regulations stay unchanged, by 2030, the average residential customer would pay an additional \$225 a year for electricity. The average commercial business would pay an additional \$1,530 a year for electricity. However, both rate hikes are a fraction of the increases that would be faced by the state's manufacturers.

Wisconsin's industrial businesses account for one-third of electricity use in the state. Because of a heavy reliance on electricity to power large machinery, the average industrial ratepayer can be expected to pay an additional \$105,094 a year in 2030.

Such a dramatic increase in energy costs for manufacturers – the backbone of Wisconsin's economy – would have a direct impact on the state's workers.

Thanks to rising electricity prices across all sectors – residential, commercial and industrial – nearly 21,000 jobs would be lost and disposable income would drop \$1.82 billion by 2030.

Wisconsin would suffer especially because of its strong reliance on electricity generated by coal-fired power plants. More than 60 percent of electricity generation in the state is from coal-fired plants, more than double the national average of 28 percent.

The rules proposed by the EPA would therefore inflict large negative impacts on the economy of Wisconsin. The state would experience significant declines in employment, wages, disposable income and investment upon implementation of the policy.

Wisconsinites and state policymakers need to be aware of the serious consequences that come with these rules.

**Average Electricity Price
Increase in Wisconsin
Under Proposed EPA Rules**

19%

2.10 cents/kWh

Introduction

Through the Environmental Protection Agency (EPA), the Obama administration unveiled an unprecedented scope of regulation in 2014 that will damage Wisconsin's energy market and overall economy if allowed to take effect as scheduled in the summer of 2015. New regulations include CO₂ emission limits on new and existing electricity power plants and new lower limits on mercury emissions from electricity power plants.¹ The EPA aims the new rules directly at coal-fired power plants, which provide nearly two-thirds of all electricity generation in Wisconsin and 28.3 percent of electricity generation in the United States.²

A growing number of state officials and people in the electricity market have serious concerns over the EPA's proposed rules because of the importance of coal as a dispatchable electricity source that provides the bulk of base load electricity to the nation's electric grids.

The new rules for existing plants would limit CO₂ emissions to 1.1 pounds (lbs.) per kilowatt hour (kWh) of electricity production.³ This is about half of the current average of 2.14 lbs. per kWh.⁴ The rule on existing coal plants would set a goal of reducing CO₂ emissions per megawatt hour of energy produced to 30 percent below the 2005 levels by 2030. The mercury rule would set an emissions limits range from between 0.0002 lbs. per Gigawatt hour (1,000,000 kilowatt hours) to 0.04 lbs. per Gigawatt hour.⁵

The EPA rules will force utilities to close coal-fired generation plants in Wisconsin or adopt expensive and unproven technologies, such as carbon capture and storage.

Federal estimates by the EPA claim these new regulations will cost over \$50 billion annually. However, the EPA contends that many of these regulations will provide tens of billions of dollars in benefits that will more than offset these enormous costs. Most of these benefits are in terms of improved health.

The EPA's projections, though, paint a much rosier picture than the actual situation because:

1. The federal agency spreads costs over decades that will actually be incurred over a few short years at the beginning of the time period. This hides the true upfront costs.
2. The EPA inappropriately uses "co-benefits" from pollutants other than CO₂, such as particulate matter, which are regulated to safe levels under other rules, and therefore causes double counting of benefits.⁶

Percent of Electricity Produced by Coal-Fired Power Plants



Wisconsin's Electricity Generation Profile

The cost of EPA regulations will not be experienced uniformly across all states, as states with a higher concentration of coal-fired power plants will experience higher costs from the regulations. Wisconsin derives 62 percent of its electricity from coal, one of the highest levels in the U.S.



While the average retail electricity price in Wisconsin is 10.28 ¢/kWh, or 17th highest in the country, the average price of electricity has jumped by 21 percent from 2007 to 2012. Not a coincidence, electricity generation from coal has dropped by 18 percent over the same period.⁷

Over the same five-year period, electricity generation using natural gas exploded in Wisconsin by 78 percent, as the price of natural gas plunged by 39 percent. One would have expected that the drop in the price of natural gas and the shift to using natural gas by electric utilities would have driven down the price of electricity over the period.

However, electricity generation by wind soared by 1,325 percent over the same period. Since wind power is more expensive and not dispatchable, it is possible the increase in wind generation is behind the increase in electricity prices.

On the other hand, it could be high demand for natural gas at times of peak electricity and heating demand that cause natural gas spot prices to soar as natural gas supply is unable to meet this elevated demand. This scenario played out in the Northeast and Midwest this past winter, when the so-called Polar Vortex (a long cold spell) caused natural gas demand to soar to over \$35 per million British Thermal Units (BTUs) from under \$5.



The problem was especially problematic in New England, where natural gas produces over 55 percent of the electricity generation capacity – far greater than the 9.4 percent in Wisconsin.⁸

Effects of the EPA Rules on Wisconsin

The new EPA rules will further reduce, if not eliminate, the use of coal over the next 15 years. This would send electricity prices soaring even higher and destabilize the electricity grid, putting residents and businesses at risk of experiencing unreliable power.⁹

In this paper, the Beacon Hill Institute at Suffolk University (BHI) estimates the costs of these new EPA rules and the impact on the state's economy.

To that end, BHI applied its STAMP® (State Tax Analysis Modeling Program) to estimate the economic effects of the EPA rules.¹⁰ We report the dollar values in 2012 Net Present Value using a three percent discount rate.

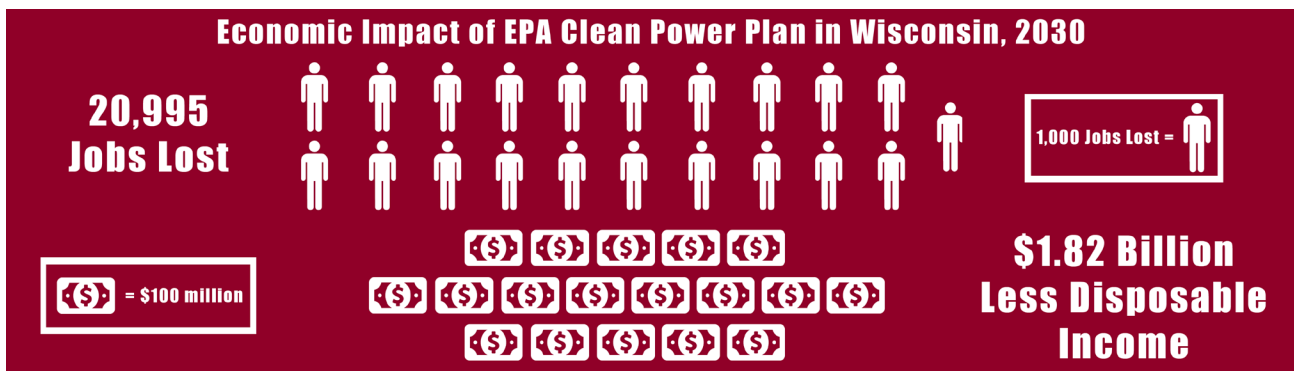
Proposed EPA Rules	Cost to Wisconsin, 2030
CO ₂ Rule for New Power Plants	\$165 Million
CO ₂ Rule for Existing Power Plants	\$313 Million
Utility Mercury Emissions Rule	\$443 Million
TOTAL	\$920 Million

It is estimated that the CO₂ emission rule on new power plants will cost Wisconsin \$165 million in 2030. The rule for existing plants will cost \$313 million and the mercury emissions rule will cost \$443 million. In total, the three regulations will cost Wisconsin \$920 million dollars in 2030. The regulations will also drive up electricity prices in Wisconsin by 2.10 cents per kWh, or 19 percent by 2030.

The increased electricity prices will have a devastating effect on Wisconsin’s families and businesses. By 2030, residential households in the state would be expected to pay an additional \$225 a year if the EPA’s proposed rules go into effect. Commercial ratepayers would see an even larger increase of \$1,530 annually by 2030.



However, Wisconsin’s manufacturing sector would be hit hardest by the new rules – which accounts for one-third of the energy use in the state. Because of a heavy reliance on electricity to power large machinery, the average industrial ratepayer can be expected to pay an additional \$105,094 a year in 2030 for electricity under the newly proposed EPA regulations.¹¹



These increased energy prices would inflict significant harm on the Wisconsin economy. The state economy would shed 20,995 jobs by 2030. The job losses and price increases would combine to reduce real incomes as firms, households and governments spend more of their budgets on energy and less on other items, such as home goods, entertainment and clothing. As a result, real disposable income would fall by \$1.82 billion by 2030. Annual investment in the state would also fall by \$236 million. The investment losses are mildly offset by the need to increase investment in other electricity technologies that are less efficient and more costly.

Conclusion

The EPA has used its rule-making authority under the Clean Air Act to force coal-fired electricity power plants to either shutdown or adopt expensive and untested technologies under the proposed rules. These policies will have grave effects on the cost and/or the reliability of the national electricity supply. Wisconsin will experience larger electricity cost and reliability impacts than the nation as a whole thanks to its higher portion of electricity production from coal-fired power plants.

The rules are aimed at reducing CO₂ emissions from producers of coal-fired power plants by either shutting them down or making their cost uncompetitive in the marketplace. If the electricity production from coal is eliminated, the diversity of the electricity supply sources will fall and become more dependent on natural gas and its price fluctuations. If the new expensive and untested carbon capture and sequestration technology is adopted electricity prices will increase.

The higher electricity costs threaten the state's industrial base. The rules proposed by the EPA would therefore inflict large negative impacts on the economy of Wisconsin. The state would experience significant declines in employment, wages, disposable income and investment upon implementation of the policy.

Wisconsinites and state policymakers need to be aware of the serious consequences that come with these rules.

Methodology

BHI utilized its STAMP (State Tax Analysis Modeling Program) model to identify the economic effects and understand how they operate through a state's economy. STAMP is a five-year dynamic CGE (computable general equilibrium) model that has been programmed to simulate changes in taxes, costs (general and sector-specific) and other economic inputs.

As such, it provides a mathematical description of the economic relationships among producers, households, governments and the rest of the world. It is general in the sense that it takes all the important markets, such as the capital and labor markets, and flows into account. It is an equilibrium model because it assumes that demand equals supply in every market (goods and services, labor and capital). This equilibrium is achieved by allowing prices to adjust within the model. It is computable because it can be used to generate numeric solutions to concrete policy and tax changes.¹²

BHI calculated the impact of the fossil fuel price increases on the price level for each of the (27) sectors of the economy within the STAMP model. Using the Energy Information Agency's (EIA) national data on GHG emissions by the residential, commercial, industrial and transportation sectors; we allocated the national emissions to the STAMP sectors.¹³

We then used data from the U.S. Census Bureau’s Economic Census as a proxy for the size of each industry in each state relative to the national data.¹⁴ We applied the cost of carbon, adjusted to be equivalent to 3.67 metric tons of CO₂, to GHG emissions in each sector, which gives us our total cost to the economy. We converted these price increases in dollars into percentage changes based on the annual value of production in each sector.

We simulated these changes in the STAMP model as a percentage price increase on fuel to measure the dynamic effects on the state economy. The model provides estimates of the proposals’ impact on employment, wages and income in Wisconsin. Each estimate represents the change that would take place in the indicated variable against a “baseline” assumption about the value that variable for a specified year in the absence of the cap-and-trade policy.



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Citations

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- ⁴ <http://www.eia.gov/tools/faqs/faq.cfm?id=74&t=11>
- ⁵ EPA. “Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards.” (December 2011), 1-6.
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- ⁷U.S. Energy Information Agency, State Electricity Profiles: Wisconsin”, Table 5. Electric power industry generation by primary energy source, 1990-2012; <http://www.eia.gov/electricity/state/wisconsin/index.cfm>.
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- ⁹Roger Bezdek and Frank Clemente, “Protect the American People: Moratorium on Coal Plant Closures Essential,” <http://instituteeforenergyresearch.org/wp-content/uploads/2014/06/Protect-the-American-People.-Moratorium-on-Coal-Plant-Closures-Essential.pdf> (June 2014).
- ¹⁰Detailed information about the STAMP® model can be found at http://www.beaconhill.org/STAMP_Web_Brochure/STAMP_HowSTAMPworks.html and <http://beaconhillinstitute.blogspot.com/2014/05/in-defense-of-stamp-as-tax-modeling-tool.html>
- ¹¹Average annual per-kWh increase in electricity cost calculated by BHI with data from Energy Information Administration, “Electric Sales, Revenue, and Average Price,” at http://www.eia.gov/electricity/sales_revenue_price/ and “Electric Power Projections for EMM Regions,” <http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2013ER&subject=0-AEO2013ER&table=62-AEO2013ER®ion=3-5&cases=early2013-d102312a>.
- ¹²For a clear introduction to CGE tax models, see John B. Shoven and John Whalley, “Applied General-Equilibrium Models of Taxation and International Trade: An Introduction and Survey,” *Journal of Economic Literature* 22 (September, 1984): 1008. Shoven and Whalley have also written a useful book on the practice of CGE modeling entitled *Applying General Equilibrium* (Cambridge: Cambridge University Press, 1992).
- ¹³U.S. Department of Energy, Energy Information Agency, American Energy Outlook 2009, Table 18: Carbon Dioxide Emissions by Sector and Source, Internet, available at www.eia.doe.gov/oiaf/servicerpt/stimulus/excel/aeostimtab_18.xls.
- ¹⁴2002 Economic Census, Summary Statistics by 2002 NAICS, United States, Internet, available at <http://www.census.gov/econ/census02/data/us/US000.HTM>.