



How Do **ENVIRONMENTAL POLICIES** Affect Employment?

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When the US Environmental Protection Agency (EPA) announced its landmark Clean Power Plan in June 2014, it immediately sparked political debate over the proposed regulation's effects on employment. While EPA Administrator Gina McCarthy touted its potential to "encourage investment that expands domestic industries and secures good paying jobs here at home," Senator Mike Enzi (R-WY) represented the opposite stance: "The administration has set out to kill coal and its 800,000 jobs."

This focus on jobs is understandable, given the large potential welfare effects of involuntary unemployment. However, economic studies of the effects of environmental regulation don't yet adequately answer the question of how regulation will affect unemployment. Economists have taken different approaches to analyzing this issue—including empirical evaluation and

modeling efforts—but all have shortcomings. Empirical studies, for example, fail to measure the effects on unregulated industries. An even more serious problem is that some of these studies use firms in unregulated industries as controls. To the extent that regulation affects employment at those firms, such studies not only will miss the effects on unregulated firms but also will yield biased estimates of the effects on regulated firms. They also ignore important job creation and destruction dynamics—for instance, are regulations causing layoffs or just reduced hiring?

More comprehensive economy-wide models generally find that environmental regulation causes small decreases in overall employment. But this approach has problems, too. Most notably, it assumes that the economy is at full employment—that everyone who wants a job finds one. In this case, unemployment is always a voluntary choice.

To better understand how environmental regulation affects employment, we developed a new model that takes into account the whole economy, recognizes that people don't find jobs immediately (and that unemployment is never zero), and permits a rigorous cost–benefit analysis that includes effects on jobs. It also takes into account a host of important labor dynamics, such as the costs to employers of finding and hiring workers, employee turnover, and incentives created by unemployment compensation.

In our model, unemployed workers search for jobs and are matched with recruiters from one of two sectors: a polluting regulated sector and a nonpolluting unregulated sector. Because the probability of finding a job is less than one each period, some unemployed workers will remain unemployed for a number of periods until they are matched into a job. Also, in each period, workers may lose their jobs. We use data from the Bureau of Labor Statistics to determine these job finding and job loss probabilities. We then apply the model to analyze three policy scenarios: a \$20 per ton carbon tax with revenue returned as a lump-sum rebate to households, the same carbon tax with revenues used to reduce payroll taxes, and a performance standard that achieves the same emissions targets as the carbon tax.

We find that imposing a carbon tax leads to 2.5 to 3 percent fewer jobs in the polluting sector of the economy. Performance standards have a much smaller effect on those industries, with a drop of about 0.25 percent.

In all three policies, however, the job losses in the “dirty” sector are nearly offset by an increase in employment in the nonpolluting sector. Because the carbon tax boosts the price of the carbon-intensive goods, demand shifts from those goods to cleaner substitutes, thereby increasing employment. Consider, for example, a shift

away from coal-fired electricity to electricity generated from renewable sources. The shifts are smallest under the performance standard and largest when the carbon tax revenues are used to reduce payroll taxes.

Consequently, the net effect on the unemployment rate in all three policies is relatively small. Instead, the policies mainly cause a shift in labor from the polluting to the nonpolluting sector. The largest unemployment effect is seen with the carbon tax with lump-sum rebates; in that policy, the unemployment rate rises by 0.26 percent. The carbon tax with revenues used to finance payroll tax cuts and the performance standard produce almost no net effect, with unemployment rates rising by 0.02 and 0.04 percent, respectively.

In addition to modeling employment impacts of environmental policies, our model also can consider other labor market outcomes, such as the average length of an unemployment spell and average after-tax earnings. As with net unemployment, we find almost no effect of any of the three policies on the average length of an unemployment spell. At most, the length would increase by only two days. For average earnings, a carbon tax with lump-sum rebates reduces long-run average earnings by almost 1 percent, but the change in long-run average earnings under a carbon tax with payroll tax cuts or a performance standard is near zero.

Our results suggest that the overall effects of major environmental policies on unemployment aren't likely to be a substantial factor in the evaluation of those policies. The effects on the labor market are much more of a job shift than net job loss. Phasing in the policy over time, providing money for buyouts, and retraining workers can all limit the costs of reallocation caused by the implementation of a major environmental policy. ●