

ACEEE's Energy Efficiency and Pollution Control (EIPC) Calculator

Purpose and Uses

The purpose of EIPC is to provide policymakers and stakeholders with a rough estimate of some of the costs and benefits of using energy efficiency to meet air quality goals in a selected state. The tool compares the costs and some of the benefits of specific energy efficiency policies with some standard air quality control measures. This calculator can be used by state regulators and policymakers to obtain a first-order estimate of what the costs and emissions benefits from energy efficiency could be in a state and to illustrate the magnitude of efficiency's potential. The calculator is also meant to assist advocacy organizations that are working to convey the importance of energy efficiency in reducing pollution.

The energy efficiency policies included in this tool are:

- Annual Energy Savings Target (standard)—A statewide energy efficiency savings goal of 1% electricity savings per year through 2025;
- Annual Energy Savings Target (lite)—A statewide energy efficiency savings goal of 0.5% electricity savings per year through 2025;
- Building Codes—Adoption of 2010 ASHRAE 90.1 and 2012 International Energy Conservation Codes for commercial and residential sectors (respectively);
- Combined Heat and Power—100 megawatt (MW) of waste heat recovery systems are installed; and
- Behavior Programs—A residential feedback program saving 2% of residential energy consumption annually from program participants.

These energy efficiency policies are compared with installation of the following emissions control measures on a representative 500 MW coal-fired power plant operating at 85% capacity:

- Selective Catalytic Reduction—An emissions control technology used to reduce emissions of NO_x by 90%;
- Flue-Gas Desulfurization—An emissions control technology used to reduce emissions of SO₂ by 95%;
- Activated Carbon Injection—An emissions control technology used to reduce emissions of mercury by 90%;
- Fuel Switching from Coal to Natural Gas—A retrofit of an existing coal-fired power plant to burn natural gas; and
- Carbon Sequestration—A post-combustion carbon dioxide (CO₂) capture and storage technology.

How to Use the Tool

Step 1. Begin in the tab labeled “Start—Inputs.” Click on the cell next to “Select State” at the top of the page, and then choose desired state from drop-down menu.

Step 2. In the cell next to “Select Energy Efficiency Measure,” choose up to three energy efficiency policies to evaluate from the drop-down menus (Step 2a – 2c). The results from the selected policies are cumulative and the user may select the same policy more than once.

Step 3. In the cell next to “Select Emissions Control Measure,” choose up to three emission control measures to evaluate from the drop-down menus (Step 3a – 3b). The results from the selected policies are cumulative and the user may select the same policy more than once.

Step 4. View the combined results for all policies and measures selected by clicking the tab labeled “Results.” The pink summary box at the top of the page contrasts the costs, pollution reductions, and energy savings in 2025 of the selected energy efficiency policies with those of the selected emissions control measures. This box provides a quick assessment of the relative air quality impacts of energy efficiency policies and more traditional approaches to reducing pollution.

The “Results” tab also includes blue and green tables that expand on the summary box by detailing the costs, pollution reductions, and energy savings for the selected efficiency policies and pollution control measures in the years 2013, 2018, and 2025.

Step 5. View the detailed results for each of the selected energy efficiency policies by selecting the tab labeled “Detailed EE Results.” This tab breaks out the total cost, cost per kilowatt-hour, and energy savings for each of the selected efficiency policies. In addition, the dollars per ton costs of selected options are included here for energy efficiency policies and emission control measures.

Limitations

This tool is not intended to provide a detailed analysis of the costs of different options to control emissions at an individual power plant or the costs and benefits of a policy or measure at a given point in time. More specifically, while estimates are provided at specific points in time (2013, 2018, and 2025), these estimates are average annual estimates. In reality, many policies and measures require an initial “ramp-up” period before the annual benefits are fully realized. Similarly, the benefits of many of the policies and measures included here may extend well beyond the thirteen-year period covered by this tool.

We acknowledge that this tool has limitations, but it is our hope that it will help users to understand some of the benefits and tradeoffs of different ways of reducing pollution from the power sector. In particular, we wanted to create a resource that will help users assess the multiple air quality benefits of energy efficiency policies and compare both those benefits and the costs with more traditional approaches to reducing pollution.

The full User’s Guide and the EEPC tool can be downloaded here: <http://aceee.org/123-solutions>.

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