


<http://www.epa.gov/avert/>

State and Local Climate and Energy Program AVoided Emissions and geneRation Tool (AVERT)

A tool that estimates the emissions benefits of energy efficiency and renewable energy policies and programs

- [Cost-effective ways to reduce air pollution and include emission benefits in Clean Air Act Plans](#)
- [What is AVERT?](#)
- [Why use AVERT?](#)
- [When should AVERT not be used?](#)
- [Who should use AVERT?](#)
- [How does AVERT work?](#)
- [How to run scenarios in AVERT](#)
- [Download AVERT](#)

Cost-effective ways to reduce air pollution and include emission benefits in Clean Air Act Plans

Many states are adopting, implementing and expanding cost-effective energy efficiency (EE) and renewable energy (RE) policies and programs. States are investing in EE/RE policies and programs to achieve benefits including lowered customer costs, improved electric supply reliability, and diversified energy supply portfolios. Energy efficiency and renewable energy also have the potential to reduce pollution of criteria air pollutants and greenhouse gases, especially on high electricity demand days that typically coincide with poor air quality.

The number of states with EE/RE policies continues to grow, but quantifying the emissions impacts of these policies and programs can be challenging. EPA is committed to helping state air quality planners calculate the emissions benefits of EE/RE policies and program so that these emission reductions can be incorporated in Clean Air Act plans to meet National Ambient Air Quality Standards (NAAQS) and other clean air goals.

What is AVERT?

AVERT is a free tool with a simple user interface designed to meet the needs of state air quality planners and other interested stakeholders. Non-experts can easily use AVERT to evaluate county-level emissions displaced at electric power plants by EE/RE policies and programs. AVERT is designed to use public data, which is accessible and auditable.

Why use AVERT?

State air quality planners, energy offices, public utility commission staff, and other organizations interested in knowing the emission benefits of EE/RE policies and programs can use AVERT to:

- Quantify the nitrogen oxides (NO_x), sulfur dioxide (SO₂), and carbon dioxide (CO₂) emissions benefits of state and multi-state EE/RE policies and programs.
- Examine the regional, state, and county level emission impacts of different EE/RE programs based on temporal energy savings and hourly generation profiles.
- Include AVERT-calculated emission impacts of EE/RE policies and programs in air quality modeling and Clean Air Act plans used to meet the National Ambient Air Quality Standards with the concurrence of the appropriate EPA regional office.
- Compare the emission impacts of different types of EE/RE programs, such as the emission impacts of wind installations versus solar installations.
- Understand the emission impacts of different EE/RE policies and programs during high electricity demand days.
- Analyze the emission benefits of EE/RE programs implemented in multiple states within an AVERT region.
- Present information about location-specific emissions benefits in easy-to-interpret tables and maps.

Learn more:

- [Fact Sheet for Decision Makers \(PDF\)](#) (2 pp, 350KB)

When should AVERT not be used?

AVERT is only intended for analyzing the emission impacts of EE/RE policies and programs. It should not be used to examine the emission impacts of major fleet adjustments or changes extending further than five years from the baseline year.

Who should use AVERT?

- Analysts who wish to improve their understanding of the emission benefits of statewide or multi-state EE/RE policies and programs.
- Environmental agency staff and state air quality planners interested in assessing emission benefits being incorporated into Clean Air Act plans to meet the National Ambient Air Quality Standards or other clean air goals.
- Energy officials or Public Utility Commission staff who want to estimate and promote the air benefits of their energy efficiency or renewable energy policies.

How does AVERT work?

AVERT represents the dynamics of electricity dispatch based on the historical patterns of actual generation in one selected year. Currently, AVERT has data for 2007- 2013.

1. AVERT's Statistical Module uses hourly "prepackaged" data from EPA's Air Markets Program Data (AMPD) to perform statistical analysis on actual behavior of past generation, heat input, SO₂, NO_x, and CO₂ emissions data given various regional demand levels. (AVERT's Statistical Module can also analyze user-modified data created in the AVERT's Excel-based Future-Year Scenario Template). AVERT's Statistical Module produces regional data files that are input files used in the AVERT's Excel-based Main Module.
2. AVERT's Main Module prompts users to select one of 10 AVERT Regional Data Files and enter EE/RE impacts (MWh or MW) from a selection of options.
3. The AVERT Main Module performs the emissions displacement calculations based on the hourly electric generating unit information in the regional data files and the EE/RE impacts entered into the tool.



Helpful Links

- [AVERT Main Module Quick Start Guide \(PDF\)](#) (12 pp, 903KB)
- [AVERT User Manual \(PDF\)](#) (78 pp, 3.3MB)
- [The AVERT Overview and Step-by-Step instructions \(PDF\)](#) (48 pp, 2.53MB)
- [Fact Sheet for Decision Makers \(PDF\)](#) (2 pp, 350KB)
- [Contact AVERT](#)

How to Run Scenarios in AVERT

[The AVERT Overview and Step-by-Step instructions \(PDF\)](#) (48 pp, 2.53MB) provides an overview of how AVERT works, and step-by-step demonstrations of how to use AVERT.

AVERT's Main Module estimates the displaced emissions likely to result from EE/RE programs in reference to a base-year or future-year scenario. Installation of AVERT's Statistical Module and AVERT's Future-Year Scenario Template is not necessary to use AVERT's Main Module to estimate displaced emissions for EE/RE programs modeled in a historic base year. However, modeling displaced emissions with reference to user-created future-years requires all three AVERT modules.

Users select one of 10 AVERT regions for analysis, upload one regional data file, and input data on the type of EE/RE program they want to analyze in AVERT. For EE policies and programs, users should have EE savings annual impacts (MWhs or MW), an understanding of the policies' or programs' temporal profiles (e.g., would the EE program save energy during peak periods or the same amount through the year), or use EPA's hourly load impact profiles for certain states with on-the-book EE policies. Please refer to the [peak energy savings summaries](#) for state hourly impact load profiles that have on-the-books EE policies or programs not incorporated in AEO 2010. For RE programs, users will need to know the total capacity of the solar or wind resource they are interesting in analyzing.

Users will then run the model to calculate the displaced generation and emissions from the chosen scenario. This calculation can take up to ten minutes depending upon the region and computer capabilities.

The AVERT Main Module provides output in the form of county-level emissions and generation tables and charts for the user's selected AVERT region. It also produces SMOKE-formatted data for advanced air modeling applications.

Learn more:

- [AVERT Main Module Quick Start Guide \(PDF\)](#) (12 pp, 903KB)
- [AVERT User Manual \(PDF\)](#) (78 pp, 3.3MB)
- [The AVERT Overview and Step-by-Step instructions \(PDF\)](#) (48 pp, 2.53MB)

Download AVERT:

Please visit the [AVERT Download Page](#) for further details.

AVERT's Main Module requires Excel 2007 or newer to run; macros must be enabled. Excel files generated in AVERT's Main Module can exceed 100 MB in size, depending on the number of units in the region of analysis.

Last updated on Wednesday, April 02, 2014

AVERT's Regions



You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.