

*Answers to your Reporting Questions: How do I report my Climate Wise successes? • What is the 1605b Voluntary Reporting Program all about? • How can Climate Wise assist?*

# CLIMATE WISE Reporting Primer

**A Guide to Voluntary Reporting of Greenhouse Gas Emissions  
Recording Results and Documenting Achievements**

1999 Data Reporting Year, Version 6.0

*What are the benefits of reporting? • When do I report? • What data and information do I need? • How do I calculate my emissions reductions? • How can Climate Wise assist?*



This Climate Wise Primer is a complement to the Energy Information Administration's Form EIA-1605, Voluntary Reporting of Greenhouse Gases (EIA 2000) and Form EIA-1605 Instructions (EIA 2000)

To receive copies of the Form and Instructions, or if you have any reporting questions, please contact:

The Climate Wise *Wise Line* at **1-800-459-WISE (1-800-459-9473)**, or  
The EIA Voluntary Reporting Hotline at **1-800-803-5182** (infohgg@eia.doe.gov).

Information on downloading Form EIA-1605 from the internet is available at:

**<http://www.eia.doe.gov/oiaf/1605/frntvrgg.html>**

For more information on the Climate Wise Program, please call the *Wise Line* or your Climate Wise Coordinator.

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# What is the Voluntary Reporting of Greenhouse Gases Program?

## In response to growing concerns about global climate change,

the U.S. Congress authorized the Voluntary Reporting of Greenhouse Gases Program under Section 1605(b) of the Energy Policy Act of 1992. Administered by the U.S. Department of Energy's Energy Information Administration (EIA), the Program is an ideal means for Climate Wise Partners to track and be recognized for their emissions reduction achievements.

The Program's fifth reporting year, for 1998 data, was a success. More than 180 entities reported on 1,507 projects. Entities filing under the Program reported reductions totaling more than 212 million metric tons of carbon dioxide emissions. While the majority of reports were filed by electric utilities, several industrial companies also reported. Twenty-five of the industry reporters are Climate Wise Partners including Dupont, General Motors, BP Amoco, Johnson & Johnson, and IBM.

Climate Wise has selected the Voluntary Reporting of Greenhouse Gases Program as its official reporting mechanism. Form EIA-1605 provides a comprehensive reporting structure that offers extensive user support, facilitates data comparability, and avoids duplication of effort. The form enables Partners to report emissions reductions achieved from 1991 through 1999 and to report projected reductions after 2000. As part of their Climate Wise Partnership Agreement, Climate Wise Partners file Form EIA-1605 to demonstrate their commitment to the Climate Wise Program and receive recognition for successful voluntary actions. In addition to demonstrating progress towards meeting Climate Wise Action Plan commitments to reduce greenhouse gas emissions, there are other important reasons to report greenhouse gas emissions reductions.

- \* To demonstrate environmental stewardship and receive recognition for voluntary actions
- \* To establish a public record of emissions and reductions.
- \* To support voluntary approaches to achieving environmental policy goals.
- \* To inform the public debate about activities to reduce greenhouse gas emissions.

This document provides an overview of the Voluntary Reporting Program including a brief summary of the key issues in filing under 1605(b) and a review of the EIA instructions and guidelines. This Primer does not replace EIA's more detailed instructions. Its goal is to introduce Partners to the Form and prepare them to file in the current reporting cycle. Partners are encouraged to consult the EIA instructions and guidelines for more detailed information. Telephone support is also available from the Climate Wise *Wise Line* (1-800-459-WISE) and from the EIA (1-800-803-5182). Climate Wise has also developed a Model Form EIA-1605 Filing to assist you in preparing the Form.

*Voluntary reporting of greenhouse gas emissions and emissions reductions benefits your company, the environment, and the public at large.*



## What Do I Report?

You may report emissions and emissions reductions of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), halogenated substances such as CFCs, nitrogen oxides (NO<sub>x</sub>), nonmethane volatile organic compounds (NMVOCs), and carbon monoxide (CO). You may also report increases in carbon sequestration.

You may report a variety of measures under 1605(b): emissions, emissions *reductions*, and increases in carbon sequestration. You may also report on a number of different levels: historic information for your company or facility; historic information for individual projects; and future commitments to specific goals, actions, emissions levels, or reductions.

We encourage Partners to report emissions information for the entire corporation (or participating facilities) and specific information for projects included in their Action Plans. Partners are encouraged to include new projects that have been implemented since they filed their Action Plan. Reporting company-level emissions and reductions provides context for and adds credibility to your emissions reduction estimates. Reporting project-level emissions provides valuable information on the most effective ways to reduce emissions of greenhouse gases and substantiates your reductions.

Under the 1605(b) program, each company determines the scope of its report as well as the approaches and data sources used to estimate emissions and reductions. While EIA will check each report for completeness, no independent verification is required. Therefore, each Climate Wise Partner must ensure that their report is credible and uses the best available approaches and data sources. You must certify the accuracy of the information you report.

Under the Voluntary Reporting of Greenhouse Gases Program, you may report on a broad variety of activities. These range from projects which increase the efficiency of your equipment to programs that affect your employees' transportation decisions. In addition to reporting your Climate Wise activities, you may report emissions reductions associated with participation in other voluntary programs, as well as reductions due to local, state, or federal requirements.

There are ten 1605(b) project categories:

- 1 Electricity Generation, Transmission, and Distribution** projects include improved efficiency in on-site electricity production and improved company-owned substations, or metering projects.
- ✓ **2 Cogeneration and Waste Heat Recovery** projects include the simultaneous production of electricity and useful thermal energy and recovery of waste heat from industrial processes.
- ✓ **3 Energy End-Use** projects involve increases in end-use energy efficiencies, including conservation, load management, and fuel switching activities. You may also report the energy efficiency effects of urban forestry projects.
- ✓ **4 Transportation and Off-Road Vehicle** activities include all projects involving emissions reductions from mobile sources, such as alternative fueled vehicles, carpooling, and infrastructure improvements.
- 5 Waste Treatment and Disposal** measures include all projects undertaken in order to reduce methane emissions from landfills (such as gas-to-energy recovery projects) and wastewater treatment plants.
- 6 Agriculture** activities include all projects undertaken to reduce methane emissions from livestock and rice fields, as well as projects involving reductions in nitrous oxide emissions from the cultivation of crops.

*You may report for your entire company and for specific projects from your Action Plan.*

*Activities most applicable to Climate Wise Partners are checked.*

- 7 Oil and Natural Gas Systems and Coal Mining** are those projects involving the recovery or reduction of methane emissions from oil and natural gas production and distribution systems and coal mines.
- ✓ **8 Carbon Sequestration** includes all projects undertaken to increase or maintain carbon sequestration, such as afforestation.
- ✓ **9 Halogenated Substances** activities are all those targeting the reduction of emissions of halogenated substances including substitution, recycling, and improved leakage control. Halogenated substances include CFCs, HCFCs, halons, and PFCS. A complete list is included in the EIA Instructions.
- ✓ **10 Other Emissions Reductions** projects (e.g., recycling) which do not fall into the above categories should be reported here.

Not all categories will apply to each Partner; however, we encourage you to file as comprehensive a report as possible.

### What Time Period Does My Report Cover?

You should report emissions for a *baseline* period. President Clinton's *Climate Change Action Plan* (CCAP) has set the goal of returning U.S. greenhouse gas emissions to 1990 levels by the year 2000. Climate Wise is one of CCAP's foundation actions and as such is oriented to a 1990 baseline. You may report actual company-level emissions for any or all of the years during the Form EIA-1605 baseline period of 1987 through 1990. Reporting baseline emissions helps your company establish an historical record of greenhouse gas emissions.

You should report emissions, emissions reductions, and increases in sequestration achieved between 1991 and 1999. Your company's commitments to reduce greenhouse gas emissions after 1999 may also be reported. This would include commitments under your Climate Wise Action Plan, additional voluntary programs, and other activities.

*You may report emissions reductions from 1991 through 1999.*

### How Do I Report?

Projects that reduce greenhouse gas emissions are reported in Form EIA-1605. The form was developed by the EIA after extensive public comment and review by industry. The result is a comprehensive and user-friendly reporting tool. The EIA also maintains a database of all emissions reduction achievements reported under the Program.

While there are two forms, EIA-1605 and EIA-1605EZ, Climate Wise Partners are asked to use the EIA-1605 version in order to establish a credible record of emissions reduction efforts. The form allows you to report emissions and reductions at the company-level, actions taken prior to 1999, activities conducted outside the United States, and future commitments.

You may complete either the hard copy or electronic version of the form. Climate Wise will send you a paper version of Form EIA-1605. A CD-ROM software version of the form is available upon request from the *Wise Line* or the EIA. The hard copy and electronic forms provide comprehensive, flexible formats that allow users to report a variety of emissions reduction projects while bypassing sections that are not applicable to their operations. The CD contains, among other documents, the public use database of reports from 1994 through 1998, the reporting form and instructions, the annual reports of the Voluntary Greenhouse Gases Program, the guidelines and supporting documents issued pursuant to Section 1605(b) as well as worksheets on recycling and sequestration.

*Use the paper or electronic version of Form EIA-1605 to create an in-depth record of emission reduction efforts.*

The EIA estimates that completion of Form EIA-1605 may take 40 hours. Form preparation time for your company will depend on the number of projects reported, the detail provided, and the amount of information readily available. Tracking energy use and maintaining project summaries to monitor performance can greatly simplify the reporting effort. The *Wise Line* is also available to assist you. Completed forms are sent to the EIA via mail, electronic mail, or modem.



*Reports received before June 1, 2000 will be included in the sixth annual report of the Voluntary Reporting Program.*

*The EIA reporting form is composed of four schedules.*

## **When Do I Report?**

Report your achievements on or before the anniversary of your Action Plan submission. Partners who are eager to go on record with their past achievements and future reductions can get an early start by creating a public record of their Action Plan commitments using the system. Reports received before **June 1, 2000**, will be included in the sixth annual update of the Voluntary Reporting Program database. We encourage all Partners who are able to report by this date to do so, but reports will be accepted at any time.

For reporting in 2000 and beyond, EIA will send you a form in an electronic format that will make updating the information as simple as possible.

## **Overview of Form EIA-1605**

Form EIA-1605 is composed of four Schedules:

**Schedule I: Entity Information and Certification** asks for basic information on your company such as address, entity type, and SIC code. If there is information included in your report that, if released to the public, would cause substantial harm to your company's competitive position, you may request that the information be kept confidential. Refer to pages 1, 2, and 7 of the Form Instructions for a discussion of how requests for confidentiality are handled by the EIA. Please certify the accuracy of your entire report by signing Schedule I.

**Schedule II: Project-Level Emissions and Reductions** allows reporting of information on specific actions that have reduced emissions or increased sequestration. Schedule II is divided into 10 sections, each covering a specific project area (see pp. 2-5). Each section requests information concerning the project's location, emissions, emissions reductions, and (if applicable) fuel or energy savings.

**Schedule III: Entity-Level Emissions and Reductions** includes information on your company's total emissions and total reductions. Company-level reporting should include actual emissions for the baseline period of 1987 through 1990, actual emissions for 1991 through 1999, emissions reductions for 1991 through 1999, increases in carbon sequestration for 1991 through 1999, and the causes of changes in emissions.

**Schedule IV: Commitments to Reduce Greenhouse Gases** includes planned actions in your Climate Wise Action Plan, additional voluntary programs, or other company commitments.

## **Which Parts of the Form Do I Complete?**

Schedule I must be completed by all entities filing Form EIA-1605.

In **Schedule II** complete only those sections for which you have projects. If you are using the hard copy of the Form, and have more than one project in the same category, please photocopy the relevant pages. You may report an unlimited number of projects using the electronic form. For example, if you have three Energy End Use projects (Section 3), you will need three copies of pages 11-14 of the Form.

Climate Wise Partners can choose to complete **Schedule II** and/or **Schedule III**. The best way to document your emissions reductions and to prepare a useful report is to report both at the project-level (Schedule II) and at the company-level (Schedule III). Project-level reporting highlights effective strategies for reducing greenhouse gas emissions. Company-level reporting lends perspective to project-level reports and helps frame them in a broader context.

Completion of **Schedule IV** is optional for Climate Wise Partners.

## Quantifying Emissions Reductions

Calculating project-level and company-level emission reductions is a straightforward four-step process.

**Step 1.** Decide the scope and boundaries of your report. For example, will you address the corporation's entity-wide emissions or only from selected facilities? Partners must decide what action (or group of actions) comprise a project. It is a good idea to aggregate similar actions into a single project to simplify your reporting effort. Foreign and domestic projects should be reported separately.

*1. Define the boundary of the entity or project.*

The project boundary should include all significant and quantifiable effects of the project. Make sure to identify all the effects of your project: direct emissions, indirect emissions, and any unintended effects.

**Direct emissions** for your company, facility or project are the releases of greenhouse gases from any source owned (wholly or in part) or leased by your company. For example, emissions from the on-site combustion of fossil fuels are direct emissions.

**Indirect emissions** are releases of greenhouse gases from sources not owned or leased by your company that occur, wholly or in part, as a result of your activities. For example, consumption of electricity purchased from a utility results in greenhouse gas emissions at a power plant.

**Unintended effects** are those that are not the primary reasons for your project. For example, if a project results in a shift of production from one facility to another, the increase in emissions at the second facility should be included in your calculations.

Because some secondary effects may be very difficult to quantify, you are not required to report them. You should, however, clearly indicate which effects were analyzed. (See *Form EIA-1605 Instructions*, p. 6.)

If an emissions source is only partially owned by your company, its emissions and any associated reductions should be allocated based on your company's ownership share. (See *Form EIA-1605 Instructions*, pp. 4, 5, 16.)

**Step 2.** Estimate the energy use for each fuel type—including electricity. Calculate CO<sub>2</sub> emissions from the combustion of fossil fuels by multiplying fuel use by the appropriate emission coefficient. Fossil fuel emissions coefficients are expressed in pounds of CO<sub>2</sub> per million Btu and are provided in Appendix B of the *Form EIA-1605 Instructions* (pp. 47-48).

*2. Estimate actual emissions within entity or project boundary.*

In order to calculate emissions from the consumption of purchased electricity, use the appropriate state-specific electricity emission factor. State-specific emission coefficients are expressed in pounds of CO<sub>2</sub> per MWh and are provided in Appendix C of the *Form EIA-1605 Instructions* (pp. 49-50).

Once you have calculated CO<sub>2</sub> emissions for each fuel type you should total CO<sub>2</sub> emissions across all fuel types.

**CO<sub>2</sub> Emissions from Electricity Usage.** CO<sub>2</sub> emissions associated with electricity consumption depend on the mix of fuel and the efficiency of the generating equipment used to produce the electricity. The Department of Energy has developed average CO<sub>2</sub> emission factors for all 50 States and the District of Columbia. These are presented in Appendix C of the Form instructions in units of MWh, short tons/MWh, and metric tons/MWh.

You can find detailed instructions on estimating carbon sequestration levels in the forestry sector chapter of the *General Guidelines for the Voluntary Reporting of Greenhouse Gases Under Section*



1605(b) of the Energy Policy Act of 1992, (EIA, 1994). The *Form EIA-1605 Instructions* also provide guidance in estimating emissions of methane, nitrous oxide, and halogenated substances.

3. *Estimate reference case emissions or sequestration.*

**Step 3.** A **reference case** estimates what emissions (or sequestration) would have been without emissions-reducing activities. Reference case emissions are compared to actual emissions to determine reductions. There are two types of reference cases: *basic* and *modified*.

A **basic reference case** reflects actual historical emissions or sequestration based on a specific year or an average range of years (e.g., 1987 through 1990). You might choose the year 1990 to reflect the goal of the *Climate Change Action Plan* or you could select a time period that is representative of the conditions during the years for which you report reductions. If you use a basic reference case you are assuming that your greenhouse gas emissions would have remained at historic levels had you not implemented any projects.

A **modified reference case** takes into account changes in production output, intermediate products such as steam or compressed air, weather conditions, or other factors that could affect CO<sub>2</sub> emissions. For example, a unit-of-production reference case is adjusted to reflect changes in production levels.

Sample projects using basic and modified reference cases are illustrated at the end of this Primer.

4. *Calculate emissions reduction or sequestration.*

**Step 4.** Subtract the actual emissions (or sequestration) from the reference case emissions (or sequestration). The resulting difference is emissions reductions for the company or for the project.

### What Data Will I Need?

There are several types of information that you may need in order to complete your EIA-1605 filing. Some of the key items are presented below along with some suggestions on where to find the information or how it might be estimated.

**Annual Fuel Use by Fuel Type.** You will need to know your company's annual fuel use by fuel type in order to calculate your **company-level emissions** associated with energy use. Annual electricity and natural gas use should be readily available from utility bills. Annual coal and oil consumption can be estimated from shipping bills. Annual use of fuel produced on-site such as process gas, waste fuels, cogenerated electricity, and steam can be approximated from engineering estimates and production data.

**Before-and-After Energy Use by Fuel Type.** You will need to know before-and-after energy use by fuel type for many projects in order to calculate **project-level emissions** reductions associated with energy use. The ideal way to verify energy-related GHG emissions reductions is to conduct before-and-after metering. When such monitoring is not practical, estimates can be developed using engineering calculations.

**Equipment Specifications.** For **project-level reporting** equipment specifications such as number, size, efficiency, and lifetime provide necessary data for engineering calculations. Much of this information may be available from documentation provided by the equipment manufacturer. Other useful sources to consider are equipment inventory logs and purchasing records.

**Production Output Data.** Production output data can be helpful in specifying a modified reference case using a unit-of-production approach. Output might be specified in terms of number of widgets, pounds of product, gallons of product, etc. Companies with diverse outputs might consider using output value (dollars) or annual production hours as proxies for quantifying production output.

**Annual Weather Data.** If your company's energy use is weather sensitive, annual weather data (expressed in heating-degree-days or cooling-degree-days) can be helpful in developing a modified reference case. This information is available from the EIA and is generally available from your local utility. (Historical weather information can also be found on the World Wide Web, for example, <http://www.nwstulsa.noaa.gov/>.)

**Sequestration.** For sequestration projects, information on species, planting density, and site conditions (soil type, climate, etc.) is required to estimate increases in sequestration.

**Non-CO<sub>2</sub> Greenhouse Gases.** Emissions and reductions of non-CO<sub>2</sub> greenhouse gases can be estimated from purchasing records, inventories, or via engineering calculations.

## Illustrations of Project Reports

The following examples illustrate how to analyze projects to be included in a Form EIA-1605 report using both basic and modified reference cases. These examples are based on hypothetical data for a fictional company but reflect the types of projects undertaken by Climate Wise Partners. The energy savings calculations are based on standard engineering estimates. Your company's specific project information along with appropriate emissions factors and other inputs should be used for your own Form EIA-1605 report.

### Steam Distribution System Project

**Basic Reference Case.** MetalCo uses coal boilers to generate steam in an intermediate step in the production of steel widgets. After conducting engineering and financial analyses, MetalCo decided to implement a steam trap maintenance program in 1998, repair steam distribution system leaks, replace deteriorating insulation of piping, and insulate unions, flanges, valves, and steam traps.

**Project Effects.** The steam distribution system efficiency improvements reduce direct CO<sub>2</sub> emissions from on-site bituminous coal combustion. Because of the similarity between activities, the steam distribution system projects are reported together. The project effects should be reported in Schedule II (Project-Level Emissions and Reductions), Part II (Specific Project Information), Section 3: Energy End Use.

**Actual 1999 Emissions.** After completing the steam distribution system efficiency improvements, the 1999 annual coal use of the boilers was 90,588 MMBtu. Applying the CO<sub>2</sub> emission coefficient for bituminous coal from Appendix B of the *Form EIA-1605 Instructions* (205.3 lbs CO<sub>2</sub> per MMBtu), the boilers' CO<sub>2</sub> emissions in 1999 were 18,597,765 lbs.

**Basic Reference Case.** Process steam demand has been relatively steady at MetalCo since 1990. Therefore, MetalCo decided to use a basic reference case for this project, based on the average annual boiler coal consumption of 100,000 MMBtu from 1990 to 1997. Applying the CO<sub>2</sub> emission coefficient for coal, MetalCo calculated the reference case CO<sub>2</sub> emissions to be 20,530,000 lbs.

**Emissions Reduction.** CO<sub>2</sub> emissions reductions are calculated by subtracting actual 1999 emissions from the reference case emissions. The boiler improvements reduced CO<sub>2</sub> emissions by 1,932,235 lbs (energy use was reduced by 9,412 MMBtu).

*Report emissions reductions associated with energy end use in Schedule II, Section 3 of Form EIA-1605.*



*Use a modified  
reference case  
to normalize  
for changes in  
production output.*

**Modified Reference Case.** Climate Wise Co.'s widget manufacturing facilities are identical to MetalCo's facilities, except that output grew from an average of 10,000 steel widgets per year in the 1990 to 1998 period to 11,000 steel widgets in 1999. Climate Wise Co. implemented the same steam system efficiency improvements as MetalCo.

**Project Effects.** The boiler efficiency initiatives reduced direct CO<sub>2</sub> emissions from on-site coal combustion. The project effects should be reported in Schedule II, Part II, Section 3 of the form.

**Actual 1999 Emissions.** After completing the steam system efficiency improvements, annual boiler coal use was 90,588 MMBtu. CO<sub>2</sub> emissions are estimated to be 18,597,765 lbs in 1999 based on the fuel consumption and the emission coefficient for bituminous coal. For each widget produced, Climate Wise Co. used 8.2 MMBtu of coal.

**Modified Reference Case.** Because widget output (and process steam demand) increased in 1999 by 10 percent over previous years, basic emission reductions do not accurately reflect the achieved increase in efficiency of steam production. Therefore, Climate Wise Co. decided to use a modified reference case to estimate the savings for this project. The modified reference case assumes that energy intensity on a unit-of-production basis (at 10.0 MMBtu per widget) would have remained unchanged without the project.

Reference case energy use is calculated by multiplying the reference case unit-of-production energy use (10.0 MMBtu per widget) by the production output in 1999 (11,000 widgets): 110,000 MMBtu. This is the level of energy Climate Wise Co. would have used in 1999 had it not implemented the steam distribution system efficiency improvements. The emission coefficient for bituminous coal (205.3 lbs per MMBtu) is then applied, resulting in reference case emissions of 22,583,000 lbs CO<sub>2</sub>.

**Emissions Reduction.** CO<sub>2</sub> emissions reductions are calculated by subtracting actual emissions from the reference case emissions. In this case, CO<sub>2</sub> emissions were reduced by 3,985,235 lbs (energy use was reduced by 19,412 MMBtu).



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