



## GREENHOUSE GAS REDUCTION COMMITMENT AND 2001 PROGRESS REPORT



*Looking toward tomorrow*

*"The future cannot be predicted. It must be created based upon our conscience, our own set of values, our own sense of right and wrong and the legacy we want to leave for future generations. The responsibility starts and ends with each of us as individuals."*

— **Wayne Leonard, CEO, Entergy**  
**2000 Business Climate Change Symposium**



## Entergy and the Risk of Global Climate Change

*As one of the largest producers of electric power in the United States, Entergy recognizes the leadership role incumbent on a company of our stature and resources. We are advocating public policy that will preserve and enhance the environment, and we know we can't perform a leadership role on the environment if we don't walk the talk.*

*All of us have a moral obligation to future generations to responsibly manage the risks and costs of climate change. It is incumbent upon every individual and business to begin taking action today to limit greenhouse gas emissions and reduce these risks. On May 3, 2001, Entergy publicly announced a corporate commitment to stabilize company CO<sub>2</sub> emissions at 2000 levels through 2005. This is our first progress report. It describes how we are conducting our stabilization program and performing on our commitment.*

*Entergy's program is demonstrating that companies can do the right thing while remaining competitive and profitable.*



— Wayne Leonard, CEO, Entergy

## Our Greenhouse Gas Commitment

In May 2001, Entergy became the first U.S. electric power company to establish a stabilization target for its CO<sub>2</sub> emissions. Entergy pledged that it would:

- ❖ Stabilize CO<sub>2</sub> emissions from its U.S. power plants at year-2000 levels through 2005.
- ❖ Establish a \$25 million Environmental Initiatives Fund (EIF) for internal and external emission reduction projects in support of reaching the 2001–2005 target.
- ❖ Document activities and annually report progress toward meeting the 2001–2005 target.
- ❖ Employ an independent third-party organization to verify measurement of Entergy's CO<sub>2</sub> emissions.
- ❖ Further evaluate potential reduction targets beyond the current 2001–2005 target and adopt a future target by the end of 2004.
- ❖ Work cooperatively with Environmental Defense, The Partnership for Climate Action, The Pew Center on Global Climate Change and other organizations committed to responsible action on global warming.



## Introduction to Entergy's Greenhouse Gas Program

### Background on Entergy Corporation

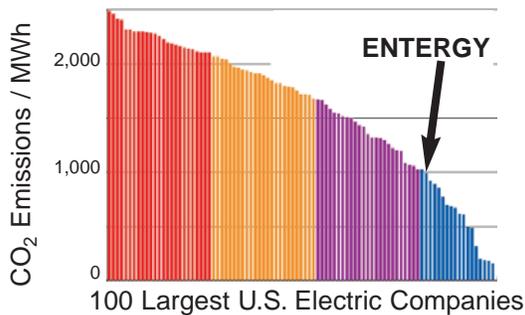
Headquartered in New Orleans, Louisiana, Entergy is the sixth-largest electricity-generating company in the U.S., with over 30,000 megawatts (MW) of generating capacity worldwide. Our electric utility serves approximately 2.6 million customers in the four states shown at right. We operate over 30 power plants and have over 15,000 employees. Our plants produce electricity from a variety of fuels and energy sources, including gas, oil, coal, hydro power, nuclear power and wind. Combustion of fossil fuels to generate electricity is the company's major source of greenhouse gas emissions, and CO<sub>2</sub> (carbon dioxide) is the major type of greenhouse gas associated with our operations.

### Entergy's Electric Utility Serves Four States



### Actions Prior to the New Commitment...A Successful Start

Year-2000 CO<sub>2</sub> Emission Rate  
(pounds per megawatt hour)



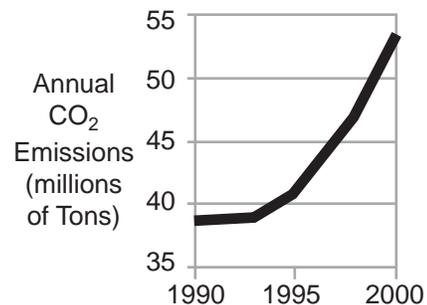
Source: NRDC, CERES and PSEG, 2002.

Entergy has been taking actions to reduce greenhouse gas emissions from all areas of its operations since 1991. In 1995, Entergy signed a Climate Action Accord with the U.S. Department of Energy as part of the Department's Climate Challenge Program. At that time, Entergy committed to reduce CO<sub>2</sub> emissions by 27 million tons over the period 1991 to 2000. Entergy exceeded this early goal by 10 percent. The steps taken to reduce emissions have helped Entergy become one of the cleanest electricity generators in the U.S. in terms of CO<sub>2</sub> emitted per unit of electricity produced (see the chart at left).

### Actions Going Forward...Facing the Challenge

Despite the reduction in greenhouse gas emissions successfully achieved between 1991 and 2000, and the company's low emission rate (or low "emissions intensity"), Entergy also experienced growth in energy demand over that decade. Although emissions were lower than they otherwise would have been, total company CO<sub>2</sub> emissions continued to increase throughout the 1990s, as shown in the graph at right. More action was needed if we were to make further progress toward mitigating the risks associated with global warming. We realized that we needed to address the challenge of accommodating future growth in electricity demand while beginning to flatten the trajectory of our corresponding growth in emissions. We decided to set a target of stabilizing CO<sub>2</sub> emissions as we entered the new decade and a new century.

### Entergy Power Plant Total CO<sub>2</sub> Emissions



*Although Entergy reduced its CO<sub>2</sub> emissions per unit of electricity generated in the 1990s, increasing customer demand required more electricity—resulting in more CO<sub>2</sub> emissions by the end of the decade.*

## ***Institution of Entergy's CO<sub>2</sub> Stabilization Program***

During the first year following announcement of the CO<sub>2</sub> target, Entergy developed and implemented a process for nominating, reviewing and approving CO<sub>2</sub> emission reduction projects to be supported by the Environmental Initiatives Fund (EIF). Two categories of projects were defined as follows:

- ❖ Internal projects at company facilities and operations, which are proposed by individual power plants and other business units; and
- ❖ External emission offset projects, which are identified through a variety of means, including contacts with non-governmental organizations, conservation groups, emission-trading institutions and other private companies engaged in greenhouse gas reduction activities.

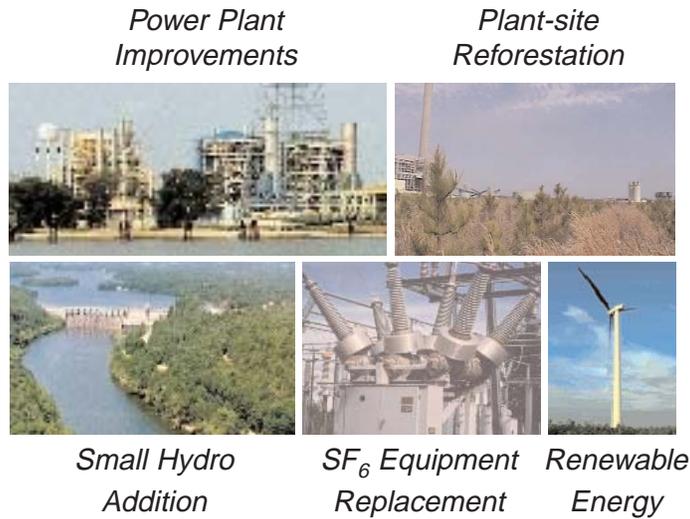
To simplify the nomination process, the application for internal projects is a web-based form on Entergy's intranet. Once identified, candidate internal and external projects are reviewed by an EIF Coordinating Committee and recommended to the company's Executive Environmental Forum for authorization. A set of policy guidelines and project selection criteria were established to help guide the process. As of May 2002, two rounds of EIF project review and approval have been completed. Over 40 projects have been brought before the Environmental Forum for consideration.

### **Overview of Entergy's CO<sub>2</sub> Target Achievement Strategy**

- ❖ **Entergy believes we must start at home**, with our first priority being emission reductions from cost-effective improvements internal to our own operations.
- ❖ **Climate change is a global problem** that also lends itself to innovative solutions external to Entergy's direct operations; therefore, Entergy will also seek cost-effective external opportunities to reduce greenhouse gas emissions or to sequester carbon.
- ❖ **With guidance from Environmental Defense**, Entergy will attempt to achieve 80 percent of the reductions needed to stabilize its CO<sub>2</sub> emissions internally, with the remaining 20 percent from external projects.
- ❖ **Entergy, through its new Environmental Initiatives Fund (EIF), will provide up to \$5 million per year** in incremental funding through the commitment period (2001–2005) to support these internal and external projects.
- ❖ **Entergy believes that innovative market mechanisms** will provide an efficient and economical way to reduce greenhouse gas emissions. We will pursue market mechanisms, such as emissions trading, as a means to achieve cost-effective emission reductions.

## First-year Program Activities

### Internal Projects to Reduce Greenhouse Gases



As of May 2002, 26 internal greenhouse gas reduction projects have been completed or are in progress at Entergy facilities and operations. Over \$8.1 million of Entergy's EIF funding has been allocated to these internal projects. In some cases, EIF funding was used to supplement normal budget allocations to make projects more economically viable. These 26 projects are forecast to achieve approximately 1.135 million tons of CO<sub>2</sub>-equivalent greenhouse gas reductions during the commitment period (2001–2005). Projects were authorized at nine different power plants. The cost of individual projects ranges from \$25,000 to over \$1 million.

The majority of the internal projects authorized to date involve efficiency improvements designed to enable fossil power plants to operate with less fuel input, thereby decreasing emissions from fuel combustion. Examples of internal projects are described below:

- ❖ Eighteen projects at five power plants to increase operating efficiencies.
- ❖ Two projects to allow individual generating units to operate at a lower minimum load (power output) when they are required to operate on active standby. This allows other, more efficient units to provide energy to the power grid.
- ❖ Two projects to reduce emissions through installation of advanced controls for the combustion process in plant boilers.
- ❖ One project to replace equipment containing sulfur hexafluoride (SF<sub>6</sub>), which is a potent greenhouse gas.
- ❖ One project to increase generation from an existing hydroelectric plant.
- ❖ Planting of trees on more than 250 acres at two company power plant sites to achieve future carbon sequestration benefits.

### Internal Project Status through May 2002

<p><i>Projects Completed or in Progress:</i> <b>26</b></p> <p><i>EIF funding:</i> . . . . . <b>\$8.1 million</b></p> <p><i>CO<sub>2</sub>-Equivalent Emission Reductions</i></p> <p><i>2001-2005:</i> . . . . . <b>1,135,000 tons</b></p>	<p><b>Project Types:</b></p> <ul style="list-style-type: none"> <li>● Power plant upgrades</li> <li>● Small hydro turbine addition</li> <li>● Renewable Energy</li> <li>● SF<sub>6</sub> electrical equipment replacement</li> <li>● Tree plantings</li> </ul>
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## External Projects to Reduce Greenhouse Gases

As of May 2002, Entergy has initiated 12 external projects to reduce emissions from sources that are not owned or operated by Entergy. These are known as “emission offset projects.” Since climate change is a global issue, and emission reductions throughout the U.S. and internationally will help decrease the overall amount of greenhouse gases in the atmosphere, such reduction projects can “offset” some of Entergy’s CO<sub>2</sub> emissions and augment the reductions Entergy achieves within its own system. The external offset projects now in progress involve \$3.4 million in funding from Entergy’s EIF and are forecast to achieve approximately 780,000 tons of CO<sub>2</sub>-equivalent reductions by 2005. A few examples of the external projects being undertaken as part of Entergy’s CO<sub>2</sub> stabilization program are briefly described below.

### External Project Examples

<p><b>Coal Mine Methane Project</b></p> <p><b>400,000 metric tons of CO<sub>2</sub></b></p>  <p>Methane is a greenhouse gas 22 times more potent than CO<sub>2</sub>. Entergy has funded a project in the eastern United States that will collect coal mine methane vented from abandoned mines and convert it to pipeline-quality gas or use it as fuel to generate electricity. The project will reduce greenhouse gas emissions by 400,000 metric tons through 2005.</p>	<p><b>Greenhouse Gas Allowance Trade</b></p> <p><b>10,000 metric tons of CO<sub>2</sub></b></p>  <p>Entergy and Elsam, the largest Danish electricity supplier, executed the first-ever international trade in CO<sub>2</sub> allowances under the Danish climate change program. In this transaction, Entergy purchased 10,000 Danish allowances from Elsam and will remove the allowances from the market, eliminating 10,000 metric tons of CO<sub>2</sub> emissions.</p>
<p><b>Direct Seed Agriculture</b></p> <p><b>30,000 tons of CO<sub>2</sub></b></p>  <p>Entergy entered into a first-of-its-kind agreement to lease 30,000 tons of CO<sub>2</sub> offset credits from the Pacific Northwest Direct Seed Association (PNDSA). The offset credits will be generated by growers who have agreed to use direct seed agriculture methods for at least 10 years. Direct seed cultivation avoids soil carbon losses from oxidation associated with using traditional farming techniques, and also reduces the growers’ fuel use and soil erosion.</p>	<p><b>Forest Sequestration</b></p> <p><b>300,000 tons of CO<sub>2</sub></b></p>  <p>Entergy is funding two large forest sequestration projects in the Mississippi Delta. The funding will be used to acquire land and easements to convert over 1,000 acres of marginal cropland to bottomland hardwood forest over the next two years. Within 80 years, the planted trees are projected to sequester over 300,000 tons of CO<sub>2</sub>. The projects will also provide wetland and wildlife habitat benefits.</p>

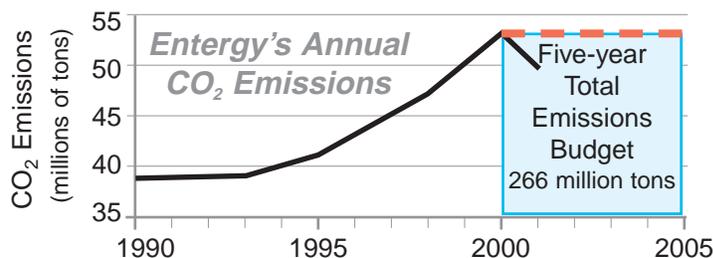
### External Project Status through May 2002

<p><b>Projects Completed or in Progress: 12</b></p> <p><b>EIF funding: . . . . . \$3.4 million</b></p> <p><b>CO<sub>2</sub>-Equivalent Emission Reductions 2001-2005: . . . . . 779,000 tons</b></p>	<p><b>Project Types:</b></p> <ul style="list-style-type: none"> <li>● Coal mine methane to energy</li> <li>● Agricultural carbon sequestration</li> <li>● Landfill gas to energy</li> <li>● Forest sequestration</li> <li>● International CO<sub>2</sub> trades</li> </ul>
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## Energy's Recent CO<sub>2</sub> Emissions and Five-year Target

Stabilization Level

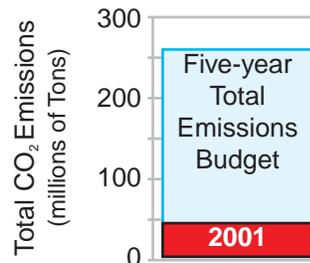
Energy's power plant CO<sub>2</sub> emissions in 2001 fell to 49.58 million tons (from 53.24 million tons in 2000). This decline, after years of increases, is certainly welcome. However, it was due mainly to the milder weather across Energy's service territory in 2001 and to other factors not associated with



Energy's CO<sub>2</sub> stabilization program. The projects being implemented in the program had not yet begun reducing emissions. Total emissions (shown as a line in the graph above) will vary from year to year and are likely to increase if different conditions prevail than were experienced in 2001. Therefore, it is also useful to express Energy's 2001–2005 CO<sub>2</sub> stabilization target in terms of a five-year “emissions budget.”

An emissions budget represents the total net cumulative emissions over the five-year target period that should not be exceeded if the CO<sub>2</sub> stabilization target is to be achieved. In practical terms, the emissions budget corresponding to Energy's five-year stabilization target is equal to five times Energy's emissions in 2000, the baseline year. The graph at right depicts Energy's five-year emissions budget, and the amount of the budget that was “used” by company CO<sub>2</sub> emissions in 2001. Energy will track the status of its emissions budget as well as year-to-year total emissions as part of measuring the progress of its stabilization program. If, despite Energy's internal reduction efforts, total direct emissions from company power plants through 2005 exceed the budget, the difference will have to be offset through external greenhouse gas reduction projects.

2001 Consumption of 5-year Total CO<sub>2</sub> Emissions Budget



### Lessons Learned

The first year of Energy's CO<sub>2</sub> stabilization program was very active—involving numerous internal briefings, establishment of internal administrative and budgeting procedures, and identification of potential emission reduction projects. The first year was also very successful. More than 35 internal and external projects were initiated, representing an investment of over \$10 million from Energy's EIF, and CH2M Hill was retained as consultant to provide independent CO<sub>2</sub> verification. Dealing with issues that emerged in the first year will contribute to the learning process. Examples of lessons learned include the following:

1. **Start early.** Control of greenhouse gas emissions is often more difficult and complex than control of other types of air emissions. (Control equipment for most other types of utility company emissions is well developed and can simply be added to the electricity generating station.)
2. **Benefits take a long time to realize fully.** For example, implementation of power plant improvements may take several years, since components must be special ordered and installation must occur during scheduled plant outages. Most of the CO<sub>2</sub> emission reductions from the projects now being undertaken by Energy will occur after the five-year timeframe of our current commitment.
3. **Realistic regulatory timelines are critical.** Because of the complexity and lengthy timeframes for implementation, sufficient lead time is needed to enable utilities to comply with any future governmental CO<sub>2</sub> requirement.
4. **Define the CO<sub>2</sub> Accounting Process.** Securing and accounting for reduction benefits from especially long-term projects, such as forest carbon sequestration, for application to near-term targets such as Energy's five-year commitment, will require further thought and innovative approaches.
5. **Build relationships for Climate Change.** Establishing relationships with a network of other companies and organizations committed to action on climate change contributes substantially to program success.



## *In Conclusion... Our Point of View*

The appropriate response to potential climate change is the subject of on-going debate and international negotiation. However, Entergy has undertaken its new commitment independent of any such political discussion or process. The actions we are taking to stabilize company CO<sub>2</sub> emissions at year-2000 levels through 2005 reflect the following point of view:

1. There is already sufficient scientific evidence to warrant treating climate change as a risk deserving action now.
2. Many of our customers live in low-lying areas near the Gulf of Mexico that are especially susceptible to the kinds of impacts being predicted from global warming.
3. It makes sense to pursue a more economically and environmentally sustainable path of reducing air emissions through an integrated strategy that includes CO<sub>2</sub>, rather than through a piecemeal pollutant-by-pollutant approach.
4. Taking action to deal with an issue like climate change will likely become more expensive for our company, our shareholders and our customers the longer we wait.

For more information regarding Entergy's climate change position and our CO<sub>2</sub> Stabilization Program, contact:

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