Entergy’s Voluntary GHG Stabilization Commitments

15th Annual Emission Inventory Conference

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Entergy is an integrated energy company engaged in electric power production, retail distribution, energy marketing and trading, and gas transportation.

Headquarters in New Orleans; operations in Gulf Coast (LA, MS, AR & TX) and Northeast (NY, MA, VT).

$26.9 billion in assets; $10 billion in revenues.

2.6 million retail customers; 14,000 employees.

30,000 MW of generation; 14,500 miles of transmission; an expanding U.S. plant portfolio.

5th largest U.S. electricity generator.
Entergy’s CO₂ emission rate is among the lowest of any US electric generating company.

- It is good and getting better.
- Entergy’s major source of greenhouse gas emissions is carbon dioxide (CO₂) from fossil-fueled power plants.
- Entergy has been taking actions since 1991 to reduce total company greenhouse gas emissions.
- The company reduced emissions by over 30 million tons CO₂E during the 90’s as part of DOE’s “Climate Challenge” Program.
In spite of reducing CO$_2$ emissions per unit of electricity, overall CO$_2$ emissions increased during the 1990's due to increased demand for electricity.

Entergy decided further action was needed to stabilize the growth of CO$_2$ emissions as we entered the new century.
Reasons Why Entergy Established a GHG Target

- Entergy management philosophy
  - Science on climate change sufficient to indicate meaningful risks
  - Responsible thing to do

- Exposure of service territory, e.g.,
  - Increased flooding from sea level rise/hurricanes
  - Increased spread of mosquito-borne tropical diseases due to warmer climate
  - Impending emission limitations on other pollutants; need for integrated approach

- Early action could mean lower cost

- CO₂ reduction actions create other co-benefits
Entergy’s Greenhouse Gas Reduction Commitment

- May 2001, Entergy established a voluntary stabilization target for CO$_2$ emissions
- Stabilize CO$_2$ from power plants at 2000 levels through 2005 (53.2 million tons CO2)
- Established Environmental Initiatives Fund (EIF)
Internal GHG Reduction Projects - end 2005

- 61 internal projects with $14.8 million to achieve 6.3 million tons CO₂ reduction by 2010
  - Power plant efficiency improvements;
  - SF6 circuit breaker replacement
  - Carbon sequestration at company property
External GHG Offset Projects

- 15 external projects with $5.5 million to achieve 3.6 million tons of CO$_2$e offsets by 2005
  - Carbon sink projects
  - Renewable energy projects
  - Geologic Sequestration
  - Production Efficiency
Tensas Wildlife Refuge Reforestation & Carbon Sequestration Project

- With Trust for Public Land & ESI, Entergy restored 1,900 acres of marginal cropland to hardwoods using low income labor;
- Donating high priority land to US FWS to expand Tensas NWR;
- Trees will remove 760,000 tons CO2 as they mature;
- Enhances habitat for Louisiana Black Bear & neotropical songbirds;
- Adds eco-tourism benefits for region
PNDSA-Entergy

Agricultural CO₂ Emission Offset Reduction Project

*Interior Pacific Northwest Region*

**Entergy**
- lease 30,000 tons sequestered carbon and 4,500 tons of emission reductions through reduced fuel use
- 3rd party verification
- study/field samples of sequestration verified against USDA CQESTR model
- Verify fuel use analysis
- Conservation Districts verify direct seeding, no residue burn

**PNDSA**
- Under contract 2002-2011
- aggregate sequestered tons
- Contract w/ individual farms
  - Direct seed, no burning
  - Transfer credits to PNDSA
  - 3rd parties access to contracted lands
- PNDSA bears permanency risk
Geologic Sequestration for Enhanced Oil Recovery

- CO2 captured from vent gas and injected into geologic formations for enhanced oil recovery.
- Verified Emission Reductions equivalent to 1,450,000 metric tons of CO2.
- Helps energy security
- Adds jobs, royalties and tax revenues
Greenhouse Gas Reduction Commitment
Progress vs. Target: 2001 - 2005

- 2001-2005 exceeded goal by 23%
- 2005 emissions below 1990 levels
## GHG - Direct Emissions

<table>
<thead>
<tr>
<th></th>
<th>2000 CO$_2$e (1,000 ST)</th>
<th>2004 CO$_2$e (1,000 ST)</th>
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<tbody>
<tr>
<td><strong>Generation</strong></td>
<td>53,235</td>
<td>38,280</td>
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<td><strong>Fleet</strong></td>
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## GHG - Direct & Indirect

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<tr>
<td>Purch Power</td>
<td>16,071</td>
<td>23,087</td>
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<tr>
<td><strong>Direct + Indirect</strong></td>
<td><strong>69,860</strong></td>
<td><strong>61,841</strong></td>
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2nd GHG Stabilization Commitment

- Stabilize CO$_2$ emissions at 20% below 2000 emissions level through 2010;
- Footprint includes self generation & controllable purchases;
- Independent 3rd party evaluation;
- Report progress annually;
- Partnership with Environmental Defense;
- Annual enterprise GHG Inventory using WRI/WBCSD protocol;
Questions
Recent hurricanes put a face on what life will be like if we fail to address Climate Change.
ETR restoration costs ~ $1.5 billion for Katrina & Rita.
Katrina - 1.1 million left without power,

800,000 Louisiana outages

Over 300,000 Mississippi outages
Red River Wildlife Refuge Reforestation & Carbon Sequestration Project

- With The Conservation Fund and Environmental Synergy, Inc., Entergy restored 600+ acres of hardwood in NW Louisiana.
- Property transferred to U.S. Fish and Wildlife Service; became the first landholding in the country’s newest national wildlife refuge.
- Trees will remove an estimated 275,000 tons of CO₂ from the atmosphere as they mature; provide federally-protected fish and wildlife habitat and recreation-driven economic benefits to the region.
Landfill Gas to Energy Project

- 50,000 metric tons of CO$_2$-equivalent greenhouse gas reductions created through the capture and beneficial use of landfill gas (methane).
- Municipal landfill methane that would otherwise be released to the atmosphere is collected as a fuel to generate electricity.
- Methane is over 20 times more potent in creating the greenhouse effect as CO$_2$. 
EIF Renewable Energy Projects
Coal Mine Methane Utilization

- Funded collection of methane vented from abandoned coal mines
- Converting methane to pipeline quality natural gas to generate electricity or provide pipeline compression.
- Will reduce 400,000 metric tons CO2e
CO$_2$ Emission Rates

Entergy vs National Average

CO$_2$ Emission Rate

Year

ETR
National
SUMMARY & CONCLUSIONS

- Invested in power production efficiency improvements,
- Increased production from non-emitting nuclear units through capacity up-rates and increased capacity factors,
- Increased production from more efficient, low emitting combined cycle gas turbines;
- Use of external offsets is critical to help meet GHG reduction targets
- Investments in external offsets, and corresponding GHG reductions, will likely remain limited absent a government program to control emissions, register GHG credits, or at least formally grant credit for early action