

Making Fossil Energy Technologies Easier on the Environment: Around the World and Around the Corner

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Need to Solve Environmental Issues Associated with Fossil Fuels

- Fossil energy use will expand over next several decades
- Alternative low-carbon energy sources not adequate to supply world energy needs
- CO₂ is principal environmental problem to be solved



Technology Policy Analysis

- **Vision: To become respected voice on issues in energy and environmental policy**
- **Focus: Fossil fuels as a key source of energy in the United States - Analyze barrier issues**
- **Focus: Global climate change - Cannot be resolved without involvement of developing economies that rely on fossil fuels**
- **Focus: International technology transfer and capacity building - Focus on introduction of advanced technologies**



NETL Global Climate Change Activities

- **Potential contributions from Fossil Energy Research & Development**
- **Assessment of Issues Impacting Trading - Data Analysis and Modeling - “Additionality”**
- **International Project Development**
- **Assessment of Climate Change Mitigation Strategies**



Sector Expertise and Research Responsibilities

- **Power Generation**
 - Utility and industrial
 - District heating
 - Retrofits, fuel switching, and emissions analysis
- **Energy Production**
 - Oil, gas, and coal
- **Transportation**
- **Alternative Fuels**
- **Carbon Sequestration**
- **Coal-bed Methane Recovery**
- **Building Efficiency**



Technology Assistance

- **Strong Developing Country Interest in Climate-friendly Fossil Technologies**
- **International Contacts**
- **Private Industry Involvement**
- **Potential to Support US negotiators via advice on Efficient Technology Transfer Structures**



Western Hemisphere

Guatemala: USAID-GCAP Landfill Gas Power Project

- Guatemala City's El Trebol landfill
 - located in central Guatemala City
 - in use since Mayan civilization
- Conducted economic feasibility study
 - landfill design options to maximize gas production; evaluate RE, GT, & FC options against electricity market prices
 - assisted Municipality w/developing Program Opportunity Notice
 - feasibility study showed 9.2-MW_e gas turbine facility is competitive with market rates for electricity
- Municipality to present project at TDA's Power & Energy in the Americas Conference (Oct. 23-25, 2000/Houston, TX) to attract investors





Near East/South Asia

USAID India - GEP Project/ECC



NTPC's 1000-MW Rihand Power Plant

- **Power Plant Efficiency Improvement Task**

- replicated Dadri demonstration results at 7 plants totaling 9100 MW_e
- can be replicated at >130 similar 200-210 MW_e coal-fired units in India
- potential **CO₂ reduction >10 million tons/yr**
- other yet-to-be implemented efficiency improvements point to **total CO₂ reduction potential >25 million tons/yr**

- Technical Assistance & Technology Transfer Activities

- technical assistance
- technology transfer



Local Outreach

Pleasant Hills Sewage Treatment Plant

- Possible use of digester gas (methane) as fuel for on-site power generation.
- NETL engineers perform feasibility study for use of fuel cells or microturbine.
- Determine microturbine is preferred as it requires no gas pretreating and less maintenance.
- Township Authority moving forward to secure funding for a project.



Local Outreach

USDA/USDOE Dairy Farm Project

- **Joint project to investigate use of digester gas from manure treatment as fuel for electricity generation on farm in Beltsville, MD.**
- **NETL team to set up instrumentation and video-cam to collect process data for energy audit and economic study.**
- **Microturbine likely technology choice.**



Local Outreach

Rails To Trails in McKeesport

- 800 feet of “The Last Mile” to be surfaced with four different blends of Coal Combustion Byproducts, CCBs.
- Fly ash, bottom ash and sulfur scrubber solids from local coal-fired power plants.
- Mixed with small amount of cement, yields surface harder and smoother than crushed limestone, but half the cost of concrete or asphalt.
- May find wide use for local/national trails.

