



Greenhouse Gas Mitigation Options Database (G-MOD)

Database of Technology and Strategy Options for Mitigation of GHG Emissions

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Presentation to Clean Air Act Advisory Committee (CAAAC)
Subcommittee on Permits/NSR/Toxics



G-MOD

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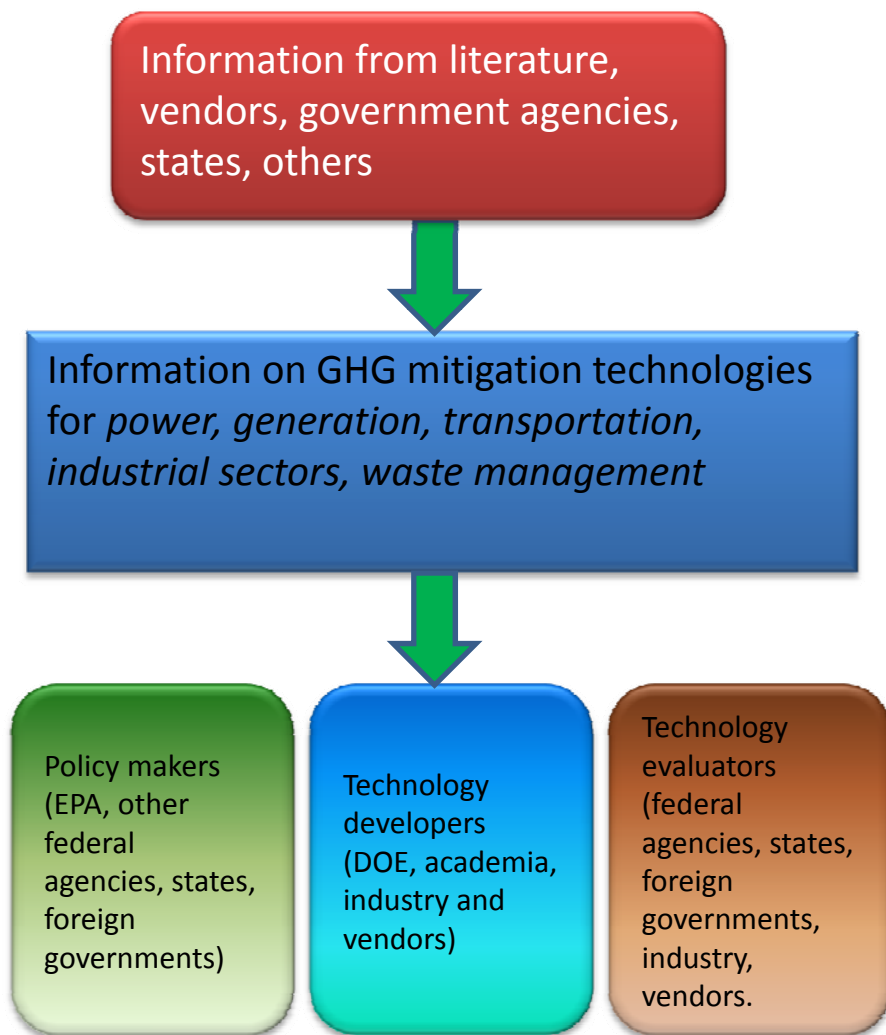
Database of Technology and Strategy Options for Mitigation of GHG Emissions



G-MOD is an application developed by the
U.S. EPA Office of Research & Development
National Risk Management Research Laboratory
Air Pollution Prevention & Control Division


G-MOD

GHG Mitigation Options Database



The database will help answer the following questions for key technologies:

- *What is the stage of development / demonstration and availability?*
- *What are the projected utilization costs?*
- *What are the ancillary impacts of technology deployment?*
 - *Water use, parasitic power load, solid waste generation, other*

Database Development

- **Stakeholders Workshop – April 2009**
 - Government (federal, state, local) – incl. EPA, DOE, USDA, etc.
 - Technology providers / technology users
 - Energy Efficiency experts
 - Sector-specific experts
 - etc.
- **Power (Utility) Specific Workshop – November 2009**
 - Government (federal, state, local) – incl. EPA, DOE, GAO, etc.
 - Technology providers / technology users
 - Industry experts and advocacy groups
 - NGOs, etc.
- **Database Development Team**
 - Eastern Research Group (ERG) / Andover Technology Partners
 - University of North Carolina Institute for the Environment (UNC-IE)
 - EPA ORD (with input from OAR/OAQPS)



Database Development

- **Beta Version released for Review – April 2010**
 - Agency reviewers (ORD, OAR, Regional, etc.)
 - Small external group coordinated by CAAAC GHG BACT working group
 - State/local regulators
 - Comments / Suggestions are being addressed now
 - Current URL = <http://ghg.ie.unc.edu:8080/GHGMDB/>
- **Version 1.0 released – November 2010**
 - Power (Utility) and Cement Sectors only
- **Subsequent versions**
 - Additional industrial sectors (petroleum refineries, pulp & paper, iron & steel, etc.)
 - Transportation / mobile sources
 - Additional or refined information in the Power and Cement sectors



Greenhouse Gas Control Technologies: Search Application - Windows Internet Explorer

File Edit View Favorites Tools Help pdf Search PDF

Greenhouse Gas Control Technologies: Search Applica...

 **United States Environmental Protection Agency**
Greenhouse Gas Mitigation Strategies Database
Search Application

Beta

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Welcome to the US EPA Greenhouse Gas (GHG) Mitigation Strategies Database (MSD). This database contains sector-based information on strategies and control technologies for mitigation of GHG emissions.

Select a sector from below, and click **Search**

Sectors :

- Cement
- Electric Utility/Power

Drop down menu to select sector –
“Electric Utility/Power” or
“Cement”

United States Environmental Protection Agency Greenhouse Gas Mitigation Strategies Database Search Application

Beta

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Guided Search for Sector: Electric Utility/Power

- Define search parameters below, then click **Search**
- To select multiple values, hold down the *Control* button (*Command* on a Mac) while selecting values.

Mitigation Technique :

- All from Mitigation Technique
- Chemical Looping
- No Carbon Capture and Storage
- Oxy Fire - Air Separation Unit
- Oxy Fire - Ceramic Autothermal Recovery
- Oxy Fire - Membrane
- Post Combustion - Carbonate
- Post Combustion - Carbozyme Membrane
- Post Combustion - Chilled NH3

Source Type :

- All from Source Type
- CFB Boiler
- Cyclone Boiler
- Geothermal
- IGCC
- NGCC
- Other Boiler
- PC Boiler
- Photovoltaic

Primary Fuel :

- All from Primary Fuel
- Biomass
- Coal
- Geothermal Fluid
- Natural Gas
- Solar Insolation
- Wind

Facility Status :

- All from Facility Status
- Existing
- New
- Retrofit

Stage of Development :

- All from Stage of Development
- commercial
- concept
- laboratory
- mature
- pilot

United States Environmental Protection Agency Greenhouse Gas Mitigation Strategies Database Search Application

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Search Summary for Sector: Electric Utility/Power

Technologies found: 8

Properties and search values:

- Mitigation Technique:** Post Combustion - MEA
- Source Type:** All from Source Type
- Primary Fuel:** Coal
- Facility Status:** All from Facility Status
- Stage of Development:** All from Stage of Development

Summary view – for search of a coal-fired boiler with post-combustion MEA carbon capture

• Right-click on the table column headers to enable additional table functionality

Views : Summary

<input type="checkbox"/>	Report	Technology	Sector	Facility Status	Source Type and Type Subcat	Primary Fuel	Mitigation Technique
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Supercritical) with Post ...	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Supercritical) with Post ...	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Ultrasupercritical) with ...	Electric Utility/Power	New	PC Boiler, Ultrasupercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Supercritical) with P...	Electric Utility/Power	Retrofit	PC Boiler, Supercritical	Coal	Post Combustion - MEA

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Search Summary for Sector: Electric Utility/Power
Technologies found: 8
Properties and search values:
Mitigation Technique: Post Combustion - MEA
Source Type: All from Source Type
Primary Fuel: Coal
Facility Status: All from Facility Status
Stage of Development: All from Stage of Development

The data can be downloaded into an MS Excel spreadsheet

• Right-click on the table column headers to enable additional table functions

Views : Summary

	Summary	Sector	Facility Status	Source Type and Type Subcat	Primary Fuel	Mitigation Technique	Stage of Development
<input type="checkbox"/>	Report Cost	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA	laboratory
<input type="checkbox"/>	Report Cost Comparison (English)	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Cost Comparison (Metric)	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Emissions (English)	Electric Utility/Power	New	PC Boiler, Ultrasupercritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Emissions (Metric)	Electric Utility/Power	New	PC Boiler, Ultrasupercritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Energy	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Waste and Life Cycle	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA	pilot
<input type="checkbox"/>	Report Retrofit Coal fired PC Boiler (Supercritical) with P...	Electric Utility/Power	Retrofit	PC Boiler, Supercritical	Coal	Post Combustion - MEA	pilot

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Search Summary for Sector: Electric Utility/Power
Technologies found: 8
Properties and search values:
Mitigation Technique: Post Combustion - MEA
Source Type: All from Source Type
Primary Fuel: Coal
Facility Status: All from Facility Status
Stage of Development: All from Stage of Development

Hyperlinked reports are available for each technology

• Right-click on the table column headers to enable
Views : Summary Change View

<input type="checkbox"/>	Report	Technology	Sector	Facility Status	Source Type and Type Subcat	Primary Fuel	Mitigation Technique
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Supercritical) with Post ...	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Supercritical) with Post ...	Electric Utility/Power	New	PC Boiler, Supercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	New Coal fired PC Boiler (Ultrasupercritical) with ...	Electric Utility/Power	New	PC Boiler, Ultrasupercritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Subcritical) with Pos...	Electric Utility/Power	Retrofit	PC Boiler, Subcritical	Coal	Post Combustion - MEA
<input type="checkbox"/>	Report	Retrofit Coal fired PC Boiler (Supercritical) with P...	Electric Utility/Power	Retrofit	PC Boiler, Supercritical	Coal	Post Combustion - MEA



Control Technology Report

Name

New Coal fired PC Boiler (Supercritical) with Post Comb - MEA

Description

Technical literature described the mitigation strategies as follows. It should be noted, that a degree of uncertainty is generally expected in cost and performance data. As a technology moves along the continuum of development from concept through commercial maturity uncertainty improves:

New 329 MW Supercritical Bituminous Wall-Fired Pulverized Coal Boiler, Air-Fired, with MEA Carbon Capture and Storage (CCS) for 90% CO₂ Removal

Sector

Electric Utility/Power

References

Technical information collected from the following source(s):

- U.S. Department of Energy, "Carbon Dioxide Capture from Flue Gas Using Dry Regenerable Sorbents", Final Report, January 2009
 - EPRI and U.S. Department of Energy, "Evaluation of Innovative Fossil Fuel Power Plants with CO₂ Removal", Interim Report, December 2000
-

Life Cycle

Technical literature described the mitigation strategies as follows. It should be noted, that a degree of uncertainty is generally expected in cost and performance data. As a technology moves along the continuum of development from concept through commercial maturity uncertainty improves:

Carbon dioxide transportation and sequestration technologies are commercially available today and will be more widely demonstrated over the next 10 -15 years. In the US, there are 35+ years of experience transporting and injecting CO₂ into the deep subsurface. While this experience is concentrated in the oil and gas sector - existing CO₂ pipelines and injection wells are used primarily for enhanced oil and gas recovery - it provides a strong foundation and many of the technologies needed for commercial-scale Carbon Capture and Storage (CCS). In the US, the Department of Energy leads efforts to advance CCS through fundamental R&D and Regional Carbon Sequestration Partnerships designed to build capacity and deploy demonstration projects.

Contact Information

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