

CO₂ Management



CO₂ Consulting Services and Technologies

AECOM has 40 years of experience serving as a technology-neutral, third-party engineer to determine the realistic viability of air and water pollution control technologies. Our services range from paper studies and laboratory work to pilot- and demonstration-scale programs and full-scale installations. AECOM has a documented history of pushing state-of-the-art technologies from idea to implementation.

CO₂ Consulting Services

AECOM leverages its experience into emerging GHG technology control programs, with applications reaching across the power, cement, oil and gas, pulp and paper, and steel industries. AECOM has managed more than 30 DOE/NETL and EPRI-sponsored projects ranging from bench-scale R&D programs evaluating novel technology concepts to pilot and full-scale evaluations.

AECOM serves as a primary R&D partner to our clients by providing the following services for emerging GHG technologies:

- Fundamental laboratory R&D investigations
- Computational modeling
- Technoeconomic analysis
- Engineering feasibility studies
- Field demonstrations
- Regulatory planning

Engineering Studies

AECOM conducts engineering studies at the pre-FEED (front-end engineering design), FEED, and detailed engineering levels and develops cost estimates at an accuracy dependent on the level of engineering completed. Site-specific considerations include footprint requirements, steam cycle integration, impact on net generation, availability of utilities, pipeline infrastructure upgrades, byproduct storage and disposal.

Laboratory Testing and Project Management

AECOM has managed a variety of GHG projects and uses extensive managerial controls and procedures to ensure safe project execution while delivering outstanding quality. AECOM's recent GHG projects include:

- Design of a 0.5-MW pilot-scale CO₂ solvent based absorber/stripper for post-combustion flue gas.
- Development of a sorbent enhanced water gas shift (SEWGS) process for pre-combustion CO₂ capture. Work included modeling, sorbent synthesis, laboratory evaluation, and a technoeconomic assessment.
- Execution of a technoeconomic assessment for Fuel Cell Energy (FCE) adapting their carbonate fuel cell to remove CO₂ from flue gas.
- Detailed engineering of balance of plant (BOP) equipment for an FCE 3-MW pilot-scale test program.

Technoeconomic Assessments

AECOM routinely conducts technoeconomic analyses of CO₂ capture technologies. These assessments take advantage of advanced capital cost estimating tools including Aspen Icarus and costing databases that were developed in-house using engineering expertise, actual costs from previous projects and information from technology vendors.

Pilot Test Programs

AECOM supports all phases of pilot-scale demonstrations of CO₂ removal technologies, including planning, detailed engineering, installation and start-up, operation, performance analysis, decommissioning, and reporting. For example, AECOM is collaborating with The University of Texas on a pilot test program investigating their advanced amine-based solvent along with more energy efficient regenerator/stripper configurations.



AECOM's High Temperature / High Pressure CO₂ Capture Laboratory Testing System.

CO₂ Technology Solutions

AECOM tailors a combination of chemistry/operational changes, upgrades to existing equipment, and integration of new and proprietary technologies to achieve regulatory compliance objectives in the most economical manner. AECOM offers comprehensive services during all stages of the air pollution control life cycle—from initial compliance strategy development to control technology demonstrations, detailed engineering, procurement, construction and startup of capital improvements.

SBS Injection™ for Heat Rate Improvement

AECOM offer a proprietary SO₃/H₂SO₄ control technology that enables coal-fired boilers to improve overall plant energy efficiency by 1-3%, achieving a corresponding reduction in CO₂ emissions. Working with a leading supplier of air heaters for the power industry, long-term testing of the SBS Injection technology has shown that typical fouling and corrosion of the air heater can be eliminated, allowing for greater heat recovery and improved plant heat rate. This approach reduces CO₂ emissions and reduces plant operating costs by millions of dollars annually.

Waste Heat Recovery

AECOM is presently conducting an evaluation of emerging technologies for the recovery and utilization of waste heat from coal-fired utility boilers. Our goal is to identify promising candidate technologies and then determine how best to assist them in their progression to commercial availability. This effort includes sufficient engineering to develop the conceptual design, estimate capital and operating costs, and predict the performance of the system for improving efficiency and reducing CO₂ emissions.

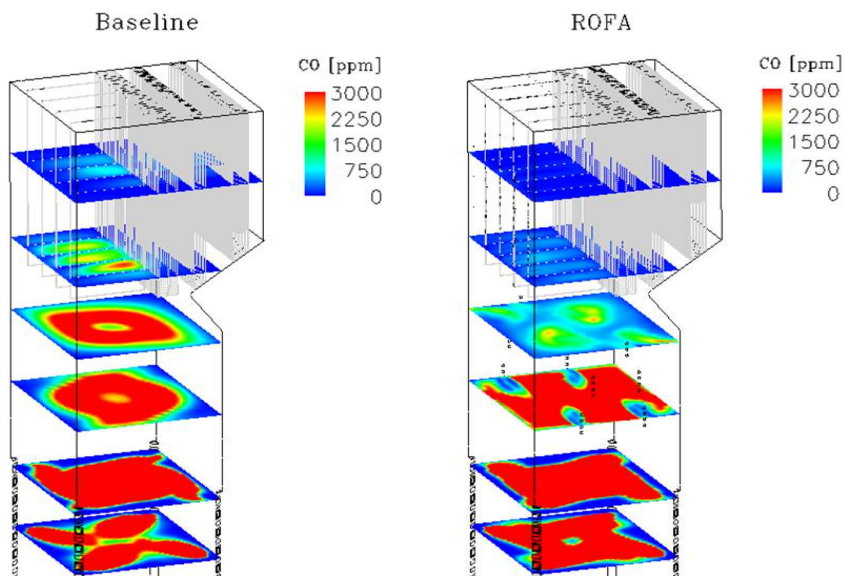
Combustion Optimization

AECOM has conducted combustion optimization and tuning projects on 5GW of installed capacity resulting in efficiency improvements of 1-2%. These improvements can be realized with minimal capital investment, typically by adjusting operating parameters such that all boiler unit operations work in concert and translate to measurable reductions in GHG emissions.

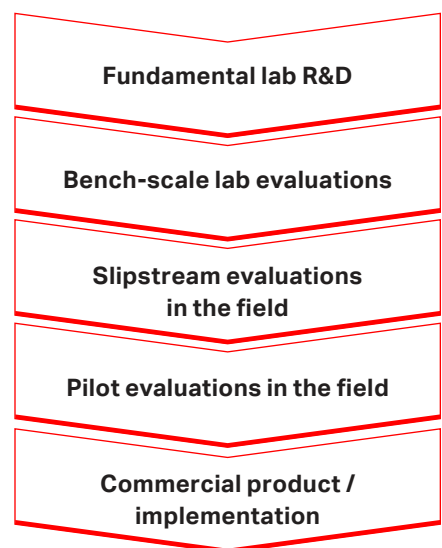
Mobotec™

AECOM is the exclusive partner for Mobotec's combustion optimization technology, ROFATM worldwide. This technology offers:

- Improved mixing of fuel and air resulting in improved combustion quality that allows for operation with lower excess oxygen, thereby reducing the amount of GHG produced per unit of electrical generation by up to 2%.
- A more uniform flue gas temperature profile at the furnace exit that reduces need for secondary superheat and secondary reheat attemperation sprays at high loads. This process lowers net unit heat rate and reduces the amount of GHG produced per unit of electrical generation.
- An increase in residence time and improved furnace combustion, thereby reducing the amount of unburned carbon in the ash and reducing the amount of fuel burned per unit of electrical generation.



CFD model illustrating combustion optimization using ROFA.



AECOM routinely offers these services when evaluating viable technologies. We have completed from lab-scale up to pilot evaluations for GHG technologies.

About AECOM

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A *Fortune 500* firm, AECOM had revenue of approximately \$18 billion during fiscal year 2015. See how we deliver what others can only imagine at aecom.com and [@AECOM](https://twitter.com/AECOM).

For more information, contact:

Katherine Dombrowski
P 512.419.5092
E katherine.dombrowski@aecom.com

Dr. Bill Steen
P 512.419.5777
E bill.steen@aecom.com

aecomprocesstechnologies.com

SBS Injection is a trademark of AECOM.
ROFA is a trademark of Mobotec.