



IMPACCT

CARBON CAPTURE TECHNOLOGY

PROJECTS:	15	FUNDING YEAR:	2010
TOTAL INVESTMENT:	\$33.7 million	PROGRAM DIRECTOR:	Dr. Karma Sawyer
PROJECT DETAILS:	www.arpa-e.energy.gov/ProgramsProjects/IMPACCT.aspx		

PROGRAM

IMPACCT's 15 projects seek to develop technologies for existing coal-fired power plants that will lower the cost of carbon capture. Short for "Innovative Materials and Processes for Advanced Carbon Capture Technologies," the IMPACCT program is geared toward minimizing the cost of removing carbon dioxide (CO₂) from coal-fired power plant exhaust by developing materials and processes that have never before been considered for this application. Retrofitting coal-fired power plants to capture the CO₂ they produce would enable greenhouse gas reductions without forcing these plants to close, shifting away from the inexpensive and abundant U.S. coal supply.

INNOVATION NEED

Coal-fired power plants provide nearly 50% of all electricity in the U.S. Without implementing carbon capture technology, the projected increase in CO₂ in the atmosphere could have serious consequences for the Earth's ecosystem. Developing new materials and processes to capture CO₂ released by coal-fired power plants would minimize harm to the environment while maintaining our ability to utilize coal—a cheap, abundant, and domestic natural resource that holds a significant place in our national energy portfolio.

IMPACCT PROGRAM GOALS

- Capture up to 90% of CO₂ at significantly lower cost
- Increase implementation of carbon capture technology

Numerous challenges remain surrounding carbon capture technology despite the past decade of intensive research and development. Chief among these challenges is the unacceptably high cost of capture. Creating new materials developed specifically for capturing CO₂ while developing more cost-effective and energy-efficient processes would enable widespread implementation of carbon capture systems, improve our environment, and position the U.S. as a leader in this growing global industry.

POTENTIAL IMPACT

If successful, IMPACCT's contribution to the development of cost-effective carbon capture technology would reduce harmful greenhouse gas emissions while allowing for the continued use of low-cost and abundant domestic coal reserves.

- **SECURITY:** Coal will continue to provide most of the electricity in the U.S. for the foreseeable future. Enabling the continued use of abundant, domestic resources will promote a safe, reliable, and consistent electric grid as the renewable energy industry develops.
- **ENVIRONMENT:** More than 30% of yearly greenhouse gas emissions in the U.S. come from coal plants. Supporting technologies that reduce emissions could prevent more than 800 million tons of CO₂ from being released into the atmosphere.
- **ECONOMY:** Present day carbon capture and storage technologies could add up to 80% to the cost of producing electricity. Investing in technologies that reduce this added cost could save homeowners and businesses billions each year on their utility bills.
- **JOBS:** Retrofitting existing coal-fired power plants to reduce their greenhouse gas emissions will require skilled labor in the manufacturing, construction, and engineering sectors.