SRI International

Carbon Capture Solutions

New approaches that meet current and emerging industry needs

SRI is developing technologies to recover carbon dioxide from today’s power plants, next-generation power plants, and other sources—even air.

SRI brings value to clients in many ways, including

- **Project management**
- **Experience with diverse carbon capture approaches, including solvents, sorbents, and membranes**
- **Process modeling and cost estimation**
- **Multidisciplinary skill sets, including materials science, catalysis, and contaminant removal**
- **State-of-the-art analysis techniques to analyze gas and liquid streams and characterize materials**

SRI expects multiple carbon capture solutions to be commercialized to reduce carbon dioxide (CO₂) in the atmosphere. The best solution for a particular location may vary with plant size and type, fuel, regulatory environment, financing considerations, CO₂ markets, or gas composition.

Project Profiles

SRI has designed and built a series of bench- and pilot-scale plants to commercialize promising technologies developed by SRI, brought to us by clients, or developed in partnership with clients.

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**Post-Combustion Technologies for Today’s Power Plants**

This CO₂ capture process (left) uses a high-capacity sorbent called BrightBlack® precision-engineered carbon, which is manufactured by ATMI, Inc., an Entegris company. SRI has tested a reactor on a slipstream at a field site. In 2016, Linde LLC will construct a pilot unit for additional testing. Solid carbon sorbents are environmentally friendly and not subject to thermal degradation.

SRI is developing a mixed-salt technology (right) that combines the benefits of ammonia and potassium-based alkaline salts with an SRI-developed low-energy regeneration process. SRI is conducting large bench-scale tests with 25 – 100 SCFM simulated flue gas streams. The process is consistent with DOE program goals of 90% CO₂ capture rate with 95% CO₂ purity at a cost of $40/tonne or less of CO₂ captured by 2025. Process advantages include low ammonia emissions and low energy and water consumption.

**Pre-Combustion Technologies for Integrated Gasification Combined Cycle (IGCC) Power Plants**

This project (left) uses an aqueous ammoniated solution containing ammonium carbonate to simultaneously remove CO₂ and hydrogen sulfide (H₂S) from mixed gas streams at high pressure. SRI, in cooperation with Bechtel Hydrocarbon Technology Solutions, Inc. and their H₂S conversion technology, will test the technology on a slipstream at a field site in 2015.

SRI developed a process to spin hollow-fiber membranes from polybenzimidazole polymer made by PBI Performance Products, Inc. These chemically and thermally stable membranes represent an environmentally friendly separation technique (right) that avoids solvents. In 2015, SRI will test a bench-scale unit on a slipstream at a field site using membrane modules assembled by Generon IGS.

Pre-Combustion Technologies for Integrated Gasification Combined Cycle (IGCC) Power Plants
SRI worked with one of the first companies to develop an alternative to conventional amine-based solvents. SRI built this pilot-scale plant to demonstrate a low-cost solvent with higher CO₂ loading capacity in a process that required less energy. The client continued scale-up and, in 2009, demonstrated the technology in a fully integrated CO₂ capture and storage project at a coal-burning power plant.

This pilot plant (left), which recovers CO₂ from air, can be located where CO₂ is consumed.

Projects for Commercial Clients

Researchers examine data from the Falling-Bead Reactor in a demonstration on The University of Toledo’s campus.

About SRI International

SRI International is a nonprofit research and innovation center headquartered in Silicon Valley. Government and business clients worldwide come to SRI for pioneering solutions in biomedical sciences and health, chemistry and materials, computing, education, economic development, energy, security and defense, robotics, sensing, and more. We provide research, laboratory and advisory services, technology development and licenses, deployable systems, products, and venture opportunities. Our innovations have created new industries and marketplace value, and lasting benefits to society.

Headquarters

SRI International
333 Ravenswood Avenue
Menlo Park, California 94025-3493
650.859.2000

Additional U.S. and international locations

www.sri.com

Stay Connected

Contact Us

Barbara Heydorn
Senior Director, Energy Center
barbara.heydorn@sri.com
650.859.5717
www.sri.com/energy

Chris Lantman
Director, Commercial Business Development
chris.lantman@sri.com
650.859.5725

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