



Air Products' Phase One Carbon Capture Project Onstream in Texas

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LEHIGH VALLEY, Pa., Jan. 28, 2013 /PRNewswire via COMTEX/ --Described by the United States Department of Energy (DOE) as a milestone in DOE's Industrial Carbon Capture and Storage (ICCS) program, Air Products (NYSE: APD) announced today that Phase One of its two stage carbon capture project in Port Arthur, Texas is onstream. Ultimately, the project will capture approximately one million tons of carbon dioxide (CO₂) annually to be recovered, purified by Air Products, and transported by Air Products via a pipeline owned by Denbury Green Pipeline-Texas, LLC for injection into the Denbury Onshore operated West Hastings Unit, an enhanced oil recovery project in Texas.

Air Products designed, constructed, and is now operating Phase One of a state-of-the-art system to capture CO₂ from one of its steam methane reformers (SMR) located within the Valero Port Arthur Refinery. The CO₂ removal technology has been retrofitted to the SMR, which produces [hydrogen](#) to assist in the making of cleaner burning transportation fuels by [refinery](#) customers on Air Products' Gulf Coast hydrogen pipeline network. Phase Two, involving a second Air Products' SMR at the site, is to be onstream in April 2013.

"We have successfully launched Phase One and would like to congratulate all of our project collaborators on the achievement. We are now focused on getting Phase Two onstream and completing the project as designed. This novel and technology-leading project would not have occurred without the support and involvement of DOE," said Wilbur Mok, vice president, North America Tonnage Gases for Air Products.

DOE stated in [its announcement](#) that, "This event marks a milestone in DOE's ICCS program: progressing beyond research and development to a demonstration scale that can be readily replicated and deployed into commercial practice within the industry. Goals of the ICCS program are to mitigate climate change through carbon capture, utilization and storage; create jobs; and position the United States as a world leader in carbon-capture technologies."

DOE provided a significant portion of the funding (66%) for the over \$400 million project. In June 2010, Air Products was selected to receive \$253 million in funding from DOE through the National Energy Technology Laboratory under the ICCS Program, which is funded by the American Recovery and Reinvestment Act (ARRA) for this project. It later received an additional \$30 million from DOE through the ARRA for final engineering, design, construction, and project operation through September 2015. Air Products' project was the only industrial gas company led undertaking selected by DOE, and one of only three projects receiving additional funding towards a commercial demonstration project.

DOE has estimated that Air Products' Port Arthur Project will assist in the recovery of 1.6-3.1 million additional barrels of domestic oil annually. DOE's announcement stated that when an oil well begins "playing out," not enough oil is pumped to make it worthwhile to continue using the well, and the well is closed or "shut-in," even though much of the original oil in the field remains in the formation. Several methods of [enhanced oil recovery](#) have been developed to recover this remaining oil, including pumping CO₂ down to the oil reservoir. In the Port Arthur project, a monitoring, verification, and accounting program will ensure that the injected CO₂ remains underground, safely and permanently trapped in the same geologic formation that confined the oil brought to the surface in the demonstration.

Air Products' Port Arthur hydrogen production facility hosting the CO₂ project is part of its industry-leading Gulf Coast hydrogen plant and pipeline supply network, [the world's largest system of its kind](#), serving multiple refinery and petrochemical operations in the region. The pipeline stretches from the Houston Ship Channel in Texas to New Orleans, Louisiana. In August it began supplying over 1.2 billion cubic feet of hydrogen per day to refinery and petrochemical customers. Air Products had operated two hydrogen pipeline systems in Texas and Louisiana before joining them with the new 180-mile segment. The 600-mile pipeline span is fed by over 20 Air Products hydrogen production facilities. Hydrogen is widely used in petroleum refining processes to remove impurities found in crude oil such as sulfur, olefins and aromatics to meet the product fuels specifications.

Air Products has worked on several carbon capture and sequestration (CCS) projects around the world for the power market. These projects include:

- The world's first full demonstration of oxyfuel CCS with Vattenfall AB, one of Europe's leading energy companies. Air Products installed its proprietary CO₂ capture, purification, and compression system at Vattenfall's research and development facility in Schwarze Pumpe, Germany, which is viewed globally as the preeminent CO₂ oxyfuel project.
- In collaboration with the Alberta Energy Research Institute, a study focusing on advanced CO₂ capture technology for use with gasification.
- In cooperation with DOE, Air Products designed and constructed a CO₂ purification system in support of an oxyfuel technology development project at a boiler-simulation facility in Windsor, Connecticut.
- Air Products demonstrated oxyfuel sour compression technology in experimental work carried out by Imperial College London with flue gas from a 160 kilowatt coal-fired combustion installation at Doosan Babcock's facility in Renfrew, Scotland, as part of the Oxycoal-UK Project.

Details on Air Products' CO₂ purification technologies can be found at http://www.airproducts.com/microsite/carbon_capture/index.asp.

Additional details on Air Products' expertise in hydrogen production and supply can be found at <http://www.airproducts.com/microsite/h2-pipeline/>.

About Air Products

Air Products (NYSE: APD) provides atmospheric, process and specialty gases; performance materials; equipment; and technology. For over 70 years, the company has enabled customers to become more productive, energy efficient and sustainable. More than 20,000 employees in over 50 countries supply innovative solutions to the energy, environment and emerging markets. These include semiconductor materials, refinery hydrogen, coal gasification, natural gas liquefaction, and advanced coatings and adhesives. In fiscal 2012, Air Products had sales of approaching \$10 billion. For

more information, visit <http://www.airproducts.com/>.

NOTE: This release may contain forward-looking statements within the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are based on management's reasonable expectations and assumptions as of the date of this release regarding important risk factors. Actual performance and financial results may differ materially from projections and estimates expressed in the forward-looking statements because of many factors not anticipated by management, including risk factors described in the Company's Form 10K for its fiscal year ended September 30, 2012.

SOURCE Air Products