



Advanced Resources  
International, Inc.

September 2010

# Advanced Resources International QUARTERLY UPDATE

Unconventional Resources • Enhanced Recovery • Carbon Sequestration

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Advanced Resources International (ARI) is a professional services firm that provides geological, reservoir engineering, business and policy analysis and advice on a global basis related to unconventional gas resources, enhanced oil recovery and geologic carbon sequestration. Our quarterly update highlights current industry trends, ongoing and completed projects, recent publications, upcoming workshops and events, and company news. We encourage you to visit our website at [www.adv-res.com](http://www.adv-res.com) to learn more about our company history, research and technology activities, industry news and much more. You may also contact our offices listed at the bottom of this page for additional information.



## SPE INTERNATIONAL CONFERENCE ON CO2 CAPTURE, STORAGE, AND UTILIZATION 10-12 NOVEMBER 2010

This conference gathers professionals in science, engineering, and policy to present and discuss the key issues surrounding the capture of carbon dioxide from anthropogenic sources and storage underground, and its beneficial use for enhanced recovery. It also addresses the legal and regulatory issues related to these activities. Everyone from Business Development Managers, Scientists, Researchers, CO2 Project Managers, and Drilling Supervisors to Geologists, Petroleum / Reservoir Engineers, Professors, and Environmentalists will benefit from the exceptional technical program being presented at this conference. George Koperna, Vice President of Advanced Resources International explains why you must attend the SPE International Conference on CO2 Capture, Storage, and Utilization, see video for more details.

<http://www.spe.org/events/co2/2010/pages/about/video.php>

For more information on this conference, please visit  
[www.spe.org/events/co2/2010](http://www.spe.org/events/co2/2010).



## PAPER PRESENTED AT 10TH ANNUAL INTERNATIONAL CONFERENCE ON GREENHOUSE GAS TECHNOLOGIES (GHGT)

During the 10th International Conference on Greenhouse Gas Technologies (GHGT-10) which was held 19th-23rd September 2010, in RAI, Amsterdam, The Netherlands, Michael Godec, Vice President of Advanced Resources International, presented the paper entitled, "[CO2 Storage in Depleted Oil Fields: The Worldwide Potential for Carbon Dioxide Enhanced Oil Recovery](#)", by Michael Godec, Vello Kuuskraa, Tyler Van Leeuwen, L. Stephen Melzer, and Neil Wildgust

One option for storing the captured CO2 from the deployment of CO2 capture and storage (CCS) is to inject the CO2 into oil fields, using it to produce additional oil. To better understand the potential and constraints offered by integrated CO2-EOR and CO2 storage, this study addressed three questions: (1) How large is the world-wide oil resource potential and associated CO2 storage capacity offered by CO2-EOR, today and in the future? (2) What factors have facilitated or hindered the wide-scale deployment of CO2-EOR? (3) What set of actions could significantly increase storage potential from the integrated application of CO2-EOR and CO2 storage?

The study reviewed the major CO2-EOR operations underway around the world to better understand the factors that facilitated or hindered their implementation. In order to assess worldwide CO2-EOR potential, a database of the largest 54 oil basins of the world (that account for approximately 95% of the world's estimated ultimately recoverable oil potential) was built, including

representation of some of the major oil fields in these basins. From this, a high-level first-order assessment of the CO<sub>2</sub>-EOR oil recovery and CO<sub>2</sub> storage potential in these basins was developed, using U.S. experience as analogue. We then tested our basin-level estimates with reservoir modeling of 47 large oil fields in 6 of these basins.

The study concluded that if CO<sub>2</sub>-EOR technology could also be successfully applied to this undiscovered resource, our estimates of the potential for the world-wide application of CO<sub>2</sub>-EOR grow to 1,070 billion barrels of oil, with associated CO<sub>2</sub> storage potential of 320 Gt. Approximately half of the potential CO<sub>2</sub> demand for CO<sub>2</sub>-EOR operations in discovered fields in the world were found to potentially be met by large, identified anthropogenic CO<sub>2</sub> sources within distances of 800 kilometers, a distance comparable to existing and planned CO<sub>2</sub> pipelines serving EOR projects. Finally, assuming U.S. \$15 per metric ton as the cost for CO<sub>2</sub> (to cover compression and transportation costs), the vast majority of this technical CO<sub>2</sub>-EOR potential could be economic to pursue at a \$70/barrel world oil price.



#### **POSTER PRESENTATION AT THE 10TH ANNUAL INTERNATIONAL CONFERENCE ON GREENHOUSE GAS TECHNOLOGIES (GHGT)**

Mr. George Koperna, Vice President of ARI, and project team members (Richard Esposito, Southern Company Generation; Richard Rhudy and Robert Trautz, Electrical Power Research Institute; and Gerald Hill, Southern States Energy Board) presented a poster titled "Integrating Carbon Capture with Transportation and Storage" at the 10th annual International Conference on Greenhouse Gas Technologies (GHGT) meeting in Amsterdam on September 22nd, 2010. The poster highlights the various elements of the Southeast Regional Carbon Sequestration Partnership (SECARB) Phase III Anthropogenic Test. This project is an integrated carbon capture, transportation and storage research program that involves the design and deployment of a 25 MW carbon capture unit at an existing pulverized coal-fired power plant along with transportation, injection and geological storage operations. ARI is responsible for injection permitting, subsurface characterization, and CO<sub>2</sub> monitoring activities for this test.

[PDF copy of poster](#)



#### **ANNUAL MEETING OF SOUTHWEST REGIONAL PARTNERSHIP ON CARBON SEQUESTRATION - PHASE II**

The final Annual Meeting of Southwest Regional Partnership on Carbon Sequestration – Phase II took place on September 21-22, 2010 in Albuquerque, New Mexico. Partners involved in Aneth EOR, San Juan Basin ECBM, SACROC EOR and terrestrial sequestration projects gathered to present the results, conclusions and lessons learned during Phase II. It was an opportunity for members of the SWP to critically discuss their work and exchange experience regarding the MVA methods deployed for each project. Potential Sequestration Sites selected for Phase III closed this meeting. Karine Schepers-Cheng presented a presentation entitled, "[Southwest Partnership on Carbon Sequestration \(SWP\) Pump Canyon CO<sub>2</sub> Enhanced Coalbed Methane \(ECBM\) / CO<sub>2</sub> Sequestration Demonstration Test Site](#)", an overview of the San Juan Basin - Pump Canyon project and discussed the challenges and successes encountered during this CO<sub>2</sub>-ECBM and Sequestration study. The lessons learned from this site and other ECBM projects concluded the presentation.



## RECS FOSTERS AND ADVANCES EDUCATION, SCIENTIFIC RESEARCH, PROFESSIONAL TRAINING AND CAREER NETWORKS IN THE EMERGING FIELD OF CCS SYSTEMS

On July 21, 2010, Karine Schepers-Cheng, Senior Reservoir Engineer of Advanced Resources, delivered a presentation at the Research Experience in Carbon Sequestration 2010 in Albuquerque, New Mexico entitled, "[Southwest Partnership on Carbon Sequestration \(SWP\) Pump Canyon CO2 Enhanced Coalbed Methane \(ECBM\) / CO2 Sequestration Demonstration Test Site](#)", the Pump Canyon Pilot Project. This project illustrates successful Enhanced Coal Bed Methane and CO2 Sequestration in Deep Unmineable Coal Seams. The presentation summarized the different phases of the project, from the site preparation, drilling and injection operations, to its closing. It specifically focused on the Monitoring Verification and Accounting (MVA) methods used to prevent and detect CO2 leakage both at the surface and at the reservoir depth, and monitor the CO2 plume migration. Lessons learned from different ECBM projects in the US regarding CO2 sequestration concluded this presentation.

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## ROCKY MOUNTAIN ENERGY EPICENTER 2010 CONFERENCE



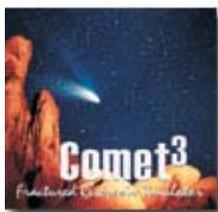
Vello Kuuskraa, president of Advanced Resources International, attended the "Rocky Mountain Energy Epicenter 2010 conference, held from July 7th through 9th, 2010 at the Colorado Convention Center, Denver, Colorado. Mr. Kuuskraa was asked to participate in "Mega Session 1: Dawn Breaks on the New Global Prize", sponsored by the Colorado Oil and Gas Association (COGA). His presentation was entitled "*From Fears of Scarcity to Expectations of Plenty: The Paradigm Shift in Natural Gas Supplies*", focusing on how our outlook for natural gas supplies has changed over the past several decades.



## RIESTENBERG PROMOTED TO PROJECT MANAGER

ARI is pleased to announce the promotion of David Riestenberg to Project Manager. David is a geologist with 8 years of experience in the petroleum and carbon industries. He is responsible for the management of ARI's domestic carbon sequestration and enhanced oil recovery projects.

[David Riestenberg's Bio](#)



## COMET3 RESERVOIR SIMULATOR

Advanced Resources' COMET3 reservoir simulator for coalbed methane (CBM) and gas shale reservoirs was the first of its kind in the marketplace, the initial version having been developed in the early 1980's when both resources combined contributed less than 1% to U.S. gas supply. Since then it has remained the industry-standard reservoir simulator for these reservoir types. Advanced technical features include:

- A triple-porosity/dual-permeability option for certain gas shale and coalbed methane (CBM) reservoirs
- Multi-component sorption for enhanced coalbed methane (ECBM) recovery and carbon sequestration (CO2 sequestration) applications
- A robust permeability model

A COMET3 brochure, as well as technical papers describing the model theories, and model testing and benchmarking studies, can be downloaded via the links below.

[Download COMET3 Brochure](#)

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**UPCOMING EVENTS**

SPE Eastern Regional Meeting  
**October 12–14, 2010** – Morgantown, WV, USA  
<http://www.spe.org/events/erm/>

SPE International Conference on CO2 Capture, Storage,  
and Utilization  
**November 10-12, 2010** – New Orleans, LA, USA  
<http://www.spe.org/events/co2/2010/>

**2010 CO2 Conference Week**  
The 8th Annual EOR Carbon Management Workshop  
**December 6-7, 2010** – Houston, TX  
The 16th Annual CO2 Flooding Conference  
Field Trip and Theme Sessions  
**December 8-10, 2010** – Midland, TX  
<http://co2conference.net/>

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