



Advanced Resources
International, Inc.

June 2014

Advanced Resources International QUARTERLY UPDATE

Unconventional Resources • Enhanced Recovery • Carbon Sequestration

Advanced Resources International 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 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.

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RESEARCH EXPERIENCE IN CARBON SEQUESTRATION

On June 6, 2014, Mr. Steven Carpenter taught two classes at the Research Experience In Carbon Sequestration. This is the second year in a row that Mr. Carpenter has been requested to teach at the RECS graduate program. Mr. Carpenter's topics included "CO₂-EOR Site Characterization, and Permitting" and an update and development on the "ISO TC-265 Carbon Capture and Storage International Standardization and the creation of Working Group 6: CO₂-EOR". The program was completed at Alabama Power's Plant Berry where the SECARB 25MW capture unit resides.

For more information:
<http://www.recso2.org/>



DEMONSTRATING STORAGE INTEGRITY AND BUILDING CONFIDENCE IN CCS

George Koperna participated in the Fourth EAGE CO₂ Geological Storage Workshop held in Stavanger, Norway, April 22 – 24, 2014 by giving a presentation entitled, "MVA Techniques and Application at the Citronelle SECARB Phase III Anthropogenic Test Site, Alabama". The presentation brought the attendees up date by providing a review of this fully integrated carbon capture and storage project and its overarching objectives. Project objectives were broken down into those necessary to appropriately monitor the injected carbon dioxide, experimental monitoring technologies that appear promising and then brought back together through their permit-driven monitoring frequency. Throughout, up to date data and results are given to provide insight into the progress of the project.

For more information:
http://www.adv-res.com/pdf/MVA_Techniques_and_Application_at_the_Citronelle_SECARB_Phase_III_Anthropogenic_Test_Site_Alabama.pdf
<http://www.eage.org/>



HOT TOPIC: UNCONVENTIONAL RESOURCES RESEARCH

April 2, 2014, Vello A. Kuuskraa, President of Advanced Resources International, Inc., participated as a panelist for The Hot Topic Session which addresses critical issues in unconventional resources research and development. The panelists presented results from current and future research on emerging resource plays, restimulation of horizontal wells, induced seismicity and control of methane emissions. Session ended with Q&A. The 2014 SPE Unconventional Resources Conference was held at The Woodlands Waterway Marriott during April 1 -3, 2014, in The Woodlands, Texas.

For more information:
http://www.spe.org/events/urc/2014/pages/schedule/tech_program/special-sessions.php



SHALE OIL & GAS REVOLUTIONS: THE GLOBAL IMPACTS

On April 2, 2014, Scott Stevens delivered the keynote speech at Nomura's signature annual event on the global impacts of the shale oil and gas revolution to an audience of over 200 economists and financial experts at the Nomura Securities Central Bankers Seminar, which was held at the Palace Hotel in Kyoto, Japan. The financial community is keenly interested in the development of shale resources in North America and the prospect for commercialization in Australia, China, Europe, Russia, and South America. Citing ARI's work on global shale for EIA and industry clients, Scott gave a cautious outlook for the pace of development outside North America due to complex geology, lack of hydraulic fracturing infrastructure, and typically slow government bureaucracies. His views were cited in a recent Bloomberg News article on shale gas development in China:

For more information:
<http://www.bloomberg.com/news/2014-02-20/china-misses-output-targets-as-it-envies-u-s-shale-gas-success.html>



GLOBAL CCS INSTITUTE'S CAPACITY DEVELOPMENT PROGRAM

On March 17, 2014, Mr. Steven Carpenter presented a tutorial for the Global CCS Institute's "Junior Professional Legal and Regulatory Tutorial Group (Tutorial Group)". The Tutorial Group has been developed as part of the Global CCS Institute's Capacity Development Program, aimed at contributing to the professional development of junior to mid-level professionals. The Institute recognizes that broad deployment of carbon capture and storage (CCS) is not expected until the 2030s. It is therefore crucial to the advancement of CCS to educate a range of junior professionals, who, in time, may be in a position to move into leadership positions or influence the deployment of CCS. This is particularly pertinent due to the long lead times experienced in the CCS field. Noting this, the Institute is implementing a specifically targeted learning environment for graduates, university students and junior to mid-level professionals where they are able to ask questions and learn, about CCS legal and regulatory developments. Mr. Carpenter presented a

60-minute overview of Standards, the Canadian-American Z-741-12 Standard, and the ISO TC-265 CCS Process.

For more information:

http://www.adv-res.com/pdf/secarb_anthropogenic_test_project_assessment_George_J_Koperna_Jr_march_2014.pdf

http://www.adv-res.com/pdf/Session_2_Development_of_the_First_Internationally_Accepted_Standard_for_Geologic_Storage_of_Carbon_Dioxide_under_International_Organization_for_Standardization_ISO.pdf

<http://www.globalccsinstitute.com/>



SOUTHERN STATES ENERGY BOARD (SSEB) ANNUAL STAKEHOLDERS MEETING

At the Southern States Energy Board (SSEB) Annual Stakeholder meeting held in Atlanta, GA on March 4-5, 2014, Mr. Steven Carpenter presented an update on the status of the SECARB Anthropogenic Test that was prepared by Mr. George Koperna. Later that day, Mr. Carpenter also provided an update on the status of the U.S. participation in ISO TC-265 Carbon Dioxide Capture, Transportation, and Geologic Storage.

For more information:

http://www.adv-res.com/pdf/secarb_anthropogenic_test_project_assessment_George_J_Koperna_Jr_march_2014.pdf

[http://www.adv-res.com/pdf/International_Organization_for_Standardization_\(ISO\)_Technical_Committee_265_\(TC-265\)_Carbon_Dioxide_Capture_Transportation_and_Geological_Storage.pdf](http://www.adv-res.com/pdf/International_Organization_for_Standardization_(ISO)_Technical_Committee_265_(TC-265)_Carbon_Dioxide_Capture_Transportation_and_Geological_Storage.pdf)

<http://www.sseb.org/>



SECARB ANTHROPOGENIC TEST UPDATE TO THE NATIONAL RISK ASSESSMENT PARTNERSHIP (NRAP) SHAREHOLDERS MEETING

On Tuesday, February 4, 2014 in Washington DC, Mr. George Koperna presented an update of the SECARB Anthropogenic Test to the National Risk Assessment Partnership. National Risk Assessment Partnership (NRAP) and Regional Carbon Sequestration Partnerships (RCSPs) are performing some integration and assessment, and Mr. Koperna presented the SECARB project and data available to be used by NRAP to accomplish their task. This task is aimed at providing a basis for considering how field data associated with RCSP activities can be used to calibrate and validate predictive tools being developed by NRAP activities, as well as presentation of NRAP tools and technologies to the RCSPs to determine potential utility by the Partnerships.

For more information:

http://www.adv-res.com/pdf/SECARB_Anthro_Test_-_NRAP_-_FEB_2014_SMC_Newsletter.pdf

<http://www.secarbon.org/>



CARBON DIOXIDE ENHANCED OIL RECOVERY INDUSTRIAL CO2 SUPPLY CRUCIAL FOR EOR

In this February 2014 American Oil & Gas Reporter, Michael Godec discussed the need for large industrial carbon dioxide sources to greatly expand carbon dioxide enhanced oil recovery (CO₂-EOR). He goes on to relate that it is not a one way exchange, noting that carbon capture utilization and storage (CCUS) needs CO₂-EOR in order to promote the economic viability of the activity. Mr. Godec supports these assertions with oil recovery and associated CO₂ storage potential estimates within the traditional main pay zones and residual oil zones of the United States. Near term growth, implementation barriers and economic benefits of CO₂-EOR are also discussed.

Please see the full article for more information:

<http://www.aogr.com/index.php/magazine/editors-choice/industrial-co2-supply-crucial-for-eor>



CHINA SHALE GAS AND SHALE OIL RESOURCE EVALUATION AND TECHNICAL CHALLENGES

For our clients BP, ConocoPhillips, and Shell, Advanced Resources International, Inc. developed a comprehensive geologic data base of shale in China, based on over 400 Chinese-language technical articles. We assessed China's shale basins and estimated risked, technically recoverable resources of over 1,000 Tcf and 30 billion bbls. However, geologic conditions are difficult due to faulting and high tectonic stress. The SPE paper describes our methodology and results as well as the unique commercial data base we developed. This paper was prepared by Scott H. Stevens, Keith D. Moodhe, and Vello A. Kuuskraa for a presentation at the SPE Asia Pacific Oil and Gas Conference and Exhibition held in Jakarta, Indonesia, October 22-24, 2013.

For more information and access to the paper:

<https://www.onepetro.org/conference-paper/SPE-165832-MS>



UPCOMING EVENTS

International Conference on Greenhouse Gas Technologies (GHGT-12)

Cockrell School of Engineering
The University of Texas at Austin
Center for Lifelong Engineering Education
Austin, TX
October 6 – 9, 2014

<http://ghgt.info/index.php/Content-GHGT12/ghgt-12-overview.html>

The Thirty-First Annual Pittsburgh Coal Conference

The David L. Lawrence Convention Center
Pittsburgh, PA
October 6 – 9, 2014
<http://www.engineering.pitt.edu/PCC.aspx?id=2147488856>

2014 SPE Eastern Regional Meeting

Charleston Civic Center
Charleston, WV
October 21-23, 2014
<http://erm2014.org/>

SPE Annual Technical Conference and Exhibition (ATCE)

RAI Centre
Amsterdam, The Netherlands
October 27 – 29, 2014
<http://www.spe.org/atce/2014/>

For a complete list of industry news, recent white papers and case studies
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