



March 2015

# 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](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.

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## THE FUTURE IS UNCONVENTIONAL

Vello Kuuskraa, President of Advanced Resources International, participated in Rice University's Industry-Rice Earth Science Symposium (IRESS) 2015, "New Geological Targets, Technologies, and Challenges: Our Continuing Dialog with Industry". This 2-day meeting took place on the campus of Rice University in Houston, Texas. Mr. Kuuskraa made the presentation entitled, "The Future is Unconventional", during Session 1: Energy Vision and Industry Perspective on the first day of the conference. Wednesday, March 11, 2015 and Thursday, March 12, 2015.

For more information:

[http://iress.rice.edu/schedule\\_2015.html](http://iress.rice.edu/schedule_2015.html)



Active Communications International

## 4TH CARBON DIOXIDE UTILIZATION CONFERENCE

On February 25, 2015, Mr. Carpenter, Vice President of ARI served as a guest panelist and speaker at the 4th Conference on Carbon Dioxide Utilization: Forward Thinking Commercial Applications of CO<sub>2</sub>, in San Antonio, TX. Mr. Carpenter was joined on the CCU Value Chain Optimization Panel by David Heldebrant, Senior Research Scientist, Pacific Northwest National Laboratory (PNNL), Dani Petrucci, FE-223 Division of Carbon Capture and Storage Research, Office of Fossil Energy, US Department of Energy, and Howard Davis, Director, Fluid Technologies. Mr. Carpenter later presented a review of CO<sub>2</sub>-EOR & CCUS worldwide potential and commercial drivers.

For more information:

[http://www.adv-res.com/contact\\_unconventional\\_resources.php](http://www.adv-res.com/contact_unconventional_resources.php)

<http://aci4.activeci.co.uk/>



Asia-Pacific  
Economic Cooperation

## CHINA CLEAN ENERGY EXCHANGE PROGRAM: CARBON CAPTURE UTILIZATION AND STORAGE (CCUS) STUDY TOUR

On February 3, 2015, Michael Godec, Vice President of Advanced Resources, gave a presentation to the delegates of the Mexican and Chinese parties of the Asia Pacific Economic Cooperation (APEC) Expert Workshop on Carbon Capture Utilization and Storage (CCUS) using Enhanced Oil Recovery (EOR), in Meridian, MS., entitled, "CO<sub>2</sub>-EOR and CCUS: Worldwide Potential and Commercial Drivers".

At the same meeting, Steve Carpenter, Vice President, Advanced Resources International gave a presentation entitled "International Organization for Standardization (ISO) Technical Committee 265 (TC-265): Carbon Dioxide Capture, Transportation, and Geological Storage".

For more information:

[http://www.adv-res.com/contact\\_unconventional\\_resources.php](http://www.adv-res.com/contact_unconventional_resources.php)

<http://www.ustda.gov/news/events/2015/EastAsia/China/ChinaCleanEnergy.asp>



## NATURAL GAS AND THE ENERGY BRIDGE

Vello Kuuskraa, President of Advanced Resources International, participated in Stanford University's Natural Gas Initiative 2015 "Natural Gas and the Energy Bridge" Symposium held in February 2015 on the Stanford University Campus in Palo Alto, California. He was a panelist on the Upstream Challenges session moderated by Professor Tony Kavscek of Stanford University. Other panelists included representatives from ConocoPhillips and Shell.

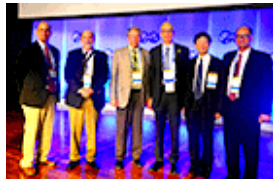
For more information:  
<https://ngi.stanford.edu/>



## INTERNATIONAL PLENARY MEETING OF THE 27 NATIONS HOSTED BY THE SOUTHERN COMPANY

Steven Carpenter, Advanced Resources International VP, Chair and Head of Delegation to the Carbon dioxide capture, transportation, and geological storage, chaired the International Plenary meeting of the 27 nations hosted by the Southern Company, at their Alabama Power, Birmingham, AL corporate offices on January 25-30, 2015. The Convening Nations Canada (SCC) and China (SAC), participating countries Australia (SA), France (AFNOR), Germany (DIN), India (BIS), Italy (UNI), Japan (JISC), Korea, Republic of (KATS), Malaysia (DSM), Netherlands (NEN), Norway (SN), South Africa (SABS), Spain (AENOR), Sweden (SIS), Switzerland (SNV), United Kingdom (BSI), and the United States (ANSI) and observing nations include Argentina (IRAM), Brazil (ABNT), Czech Republic (UNMZ), Egypt (EOS), Finland (SFS), Iran, Islamic Republic of (ISIRI), New Zealand (SNZ), Serbia (ISS), and Sri Lanka (SLSI) met for a week to conduct ISO business. Advanced Resources International, George Koperna, Jr. is an international expert and attending as a delegate to Working Group 6: CO2-EOR.

For more information:  
<http://www.southerncompany.com>



## CO2-EOR AND CCUS: WORLDWIDE POTENTIAL AND COMMERCIAL DRIVERS

George Koperna and Haroon Khesghi (ExxonMobil) moderated a session at the Society of Petroleum Engineers Annual Technical Conference and Exhibition, which was held October 27-29 in Amsterdam. The session was entitled "CO2-EOR as a pathway to CCUS" and had four panelists discussing topics ranging from burgeoning CO2-EOR pilots in China and Texas to mature analogs from a historical flood at the Means field. Michael Godec of Advanced Resources set the stage for the session, discussing "CO2-EOR and CCUS: Worldwide Potential and Commercial Drivers."

For more information:  
[http://adv-res.com/pdf/CO2-EOR\\_and\\_CCUS\\_Worldwide\\_godec\\_spe\\_amsterdam\\_oct\\_2014.pdf](http://adv-res.com/pdf/CO2-EOR_and_CCUS_Worldwide_godec_spe_amsterdam_oct_2014.pdf)

## DEVELOPMENT OF THE FIRST INTERNATIONALLY ACCEPTED STANDARD FOR GEOLOGIC STORAGE OF CARBON DIOXIDE UTILIZING ENHANCED OIL RECOVERY (EOR) UNDER THE INTERNATIONAL STANDARDS ORGANIZATION (ISO) TECHNICAL COMMITTEE TC-265

At the 31st Annual International Pittsburgh Coal Conference for COAL - ENERGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT, October 6 - 9, 2014, at the David L. Lawrence Convention Center, Steve Carpenter, Chaired three sessions in the Shale and Coal Bed Gas track.



Steve also presented a paper on the “Development of the First Internationally Accepted Standard for Geologic Storage of Carbon Dioxide Utilizing Enhanced Oil Recovery (EOR) Under the International Standards Organization (ISO) Technical Committee TC-265”, coauthored by George Koperna, Jr., Advanced Resources International, Inc., USA.



### PROJECT ASSESSMENT AND EVALUATION OF THE AREA OF REVIEW (AOR) AT THE CITRONELLE SECARB PHASE III SITE, ALABAMA USA

Hunter Jonsson presented a paper entitled, “Project Assessment and Evaluation of the Area of Review (AOR) at the Citronelle SECARB Phase III Site, Alabama USA”, coauthored by George Koperna, Jr., Steven M. Carpenter, and Robin Petrusak, of Advanced Resources International, Inc.; Rob Trautz and Dick Rhudy, EPRI; and Richard Esposito, Southern Company, USA.

For more information:

<http://www.engineeringx.pitt.edu/pcc/>



### GREENHOUSE GAS TECHNOLOGIES (GHGT) 12 CONFERENCE, AUSTIN, TX

Project Assessment and Evaluation of the Area of Review (AOR) at the Citronelle SECARB Phase III Site, Alabama USA

The IEAGHG organized the Greenhouse Gas Technologies (GHGT) 12 Conference in Austin, TX during the week of October 6, 2014. At the meeting, George Koperna presented a paper entitled “Project Assessment and Evaluation of the Area of Review (AOR) at the Citronelle SECARB Phase III Site, Alabama USA”, coauthored by Steven M. Carpenter and Robin Petrusak, with Advanced Resources International, Inc.; Rob Trautz and Dick Rhudy, with EPRI; and Richard Esposito, with Southern Company, USA. A PDF of the PowerPoint is available for download.

For more information:

[http://adv-res.com/pdf/TS11-C3\\_Koperna\\_Project\\_assessment\\_and\\_evaluation\\_of\\_the\\_Area\\_of\\_Review\\_\(AoR\)\\_at\\_the\\_Citronelle\\_SECARB\\_Phase\\_III\\_site,\\_Alabama\\_USA.pdf](http://adv-res.com/pdf/TS11-C3_Koperna_Project_assessment_and_evaluation_of_the_Area_of_Review_(AoR)_at_the_Citronelle_SECARB_Phase_III_site,_Alabama_USA.pdf)



### DEVELOPMENT OF THE FIRST INTERNATIONALLY ACCEPTED STANDARD FOR GEOLOGIC STORAGE OF CARBON DIOXIDE UTILIZING ENHANCED OIL RECOVERY (EOR) UNDER THE INTERNATIONAL STANDARDS ORGANIZATION (ISO) TECHNICAL COMMITTEE TC-265

At this meeting, Steve Carpenter also presented a paper entitled, “Development of the First Internationally Accepted Standard for Geologic Storage of Carbon Dioxide Utilizing Enhanced Oil Recovery (EOR) Under The International Standards Organization (ISO) Technical Committee TC-265”, coauthored by George Koperna, both with Advanced Resources International, Inc. A recent study for the International Energy Agency Greenhouse Gas Program (IEAGHG) assessed the CO<sub>2</sub>-EOR and CO<sub>2</sub> storage potential of the largest 54 oil basins in the world. The assessment concluded that fifty of these basins have reservoirs amenable to miscible CO<sub>2</sub>-EOR. Assuming “state-of-the-art” technology, oil fields in just the largest discovered fields in these basins (those greater than 50 million barrels of original oil in place) have the potential to produce 470 billion barrels of additional oil, and store 140 billion metric tons of CO<sub>2</sub>. A PDF of the PowerPoint is available for download.

For more information:

[http://adv-res.com/pdf/SCarpenter - ISO TC-265 \(General\) April 2014 rev02.pdf](http://adv-res.com/pdf/SCarpenter - ISO TC-265 (General) April 2014 rev02.pdf)



## DEVELOPING POROSITY WITH A NEURAL NETWORK APPLICATION FOR GEOLOGIC MODELING

Hunter Jonsson, Reservoir Engineer, also presented a poster entitled, "Developing Porosity with a Neural Network Application for Geologic Modeling", coauthored by George Koperna, Jr., Vice President, and John Ryan MacGregor, Research Assistant, all with Advanced Resources International, Inc., concluding that an artificial neural network is a useful tool to extract additional information from historical subsurface data that may otherwise be limited in usefulness. However, it is important that two primary conditions are met. To maximize the potential of the network; 1) there must be enough modern log and core data to ensure a sufficiently trained neural network and 2) the historical field logs that will be modernized should comprehensively represent the area of interest.



At this conference Mike Godec, presented 2 posters, one entitled, "CO2-ECBM: A Review of its Status and Global Potential" and the second one entitled, "Enhanced Gas Recovery and CO2 Storage in Gas Shales: A Summary Review of its Status and Potential".

For more information:  
[www.sciencedirect.com](http://www.sciencedirect.com)

## ARI PROMOTIONS:



**Mr. Clark C. Talkington** is a **Vice President** with Advanced Resources International, Inc. He has over 20 years of experience in energy and environmental matters across public, private and multilateral organizations with the last 13 years focused principally on climate change and sustainable energy development.

Prior to joining ARI, Mr. Talkington was Sr. Vice President at Sindicatum Carbon Capital where he was responsible for managing a global team that originated and structured coal mine methane projects in the United States and China. At Sindicatum, he also supported development of other clean energy and renewable energy projects. Mr. Talkington's background also includes positions at the United Nations Economic Commission for Europe in Geneva, Switzerland managing the work programs for cleaner electricity production, coal mine methane, and petroleum and mineral reserves classification, and at the U.S. Environmental Protection Agency's Climate Change Division where he led EPA's Coalbed Methane Outreach Program and co-chaired the Global Methane Initiative Coal Mine Technical Subcommittee.

Mr. Talkington holds a Masters in Public Affairs from the University of Texas and a B.S. in Political Science from Texas A&M University.

[http://www.adv-res.com/senior\\_staff.php#Talkington](http://www.adv-res.com/senior_staff.php#Talkington)



## ARI WELCOMES:

**Mr. David E. Riestenberg** is a **Project Manager** with Advanced Resources International, Inc. He has over 13 years of experience in the energy sector, with emphasis on the geologic aspects of unconventional resources and the use of carbon dioxide for both enhanced recovery and sequestration. He is the project manager and monitoring lead for the SECARB RCSP Phase III Anthropogenic Test being conducted in Mobile County Alabama.

Previously Mr. Riestenberg served as the geologic operations lead for EQT Production Company, a large gas shale E&P operator where he supervised the drilling of over 150 horizontal wells. Prior to that Mr. Riestenberg served as a post-masters research associate at Oak Ridge National Laboratory where he studied natural and artificially produced gas hydrates. Mr. Riestenberg holds a Bachelor of Science in Biology from the College of Mount St. Joseph, Cincinnati

and a Master of Science in Geology from the University of Tennessee, Knoxville. Mr. Riestenberg is an active member of the American Association of Petroleum Geologists and the Society of Petroleum Engineers.

[http://www.adv-res.com/senior\\_staff.php#Riestenberg](http://www.adv-res.com/senior_staff.php#Riestenberg)



**Ms. Vida Gholami** is a **Senior Consultant** with Advanced Resources International, Inc. Prior to joining ARI, Ms. Gholami was Research Associate at the department of Petroleum and Natural Gas Engineering of West Virginia University, where she was responsible for supervising a research team and performing multiple projects in the area of data driven modeling and numerical modeling and simulation of CO2 sequestration and EOR.

Her area of expertise is application of artificial intelligence and data mining in oil and gas E&P, and reservoir modeling and simulation. She holds a B.Sc. degree in Petroleum Engineering from Petroleum University of Technology and M.Sc. and Ph.D. degrees in Petroleum and Natural Gas Engineering awarded from West Virginia University.



## UPCOMING EVENTS

### **2015 Spring Meeting and 11th Global Congress on Process Safety**

Hilton Austin & Austin Convention Center

Austin, TX 78701

April 26-30, 2015

<http://www.aiche.org/conferences/aiche-spring-meeting-and-global-congress-on-process-safety/2015>

### **OTC2015 Offshore Technology Conference**

NRG Park

Houston, TX

May 4 – 7, 2015

<http://2015.otcnet.org/>

### **The 14th Annual Carbon Capture Utilization & Sequestration Conference**

David L. Lawrence Convention Center

Pittsburgh, PA

April 28 - May 1, 2015

<http://www.exchangemonitor.com/forums/the-annual-ccus-conference/>

### **AAPG 2015 Annual Convention & Exhibition with SEPM (Society for Sedimentary Geology)**

Colorado Convention Center

Denver, CO

May 31 – June 3, 2015

<http://ace.aapg.org/2015>

### **SPE Annual Technical Conference and Exhibition**

George R. Brown Convention Center

Houston, TX

September 28 – 30, 2015

<http://www.spe.org/atce/2015/>

### **Carbon Management Technology Conference**

Houston, TX

October 04 – 06, 2015

<http://fscarbonmanagement.org/event/cmtc-2015>

**The 2015 Pittsburgh Coal Conference**

The David L. Lawrence Convention Center  
Pittsburgh, PA  
October 5-8, 2015  
[www.pccpitt.org](http://www.pccpitt.org)

**2015 Eastern Regional Meeting**

Waterfront Place Hotel  
Morgantown, West Virginia, USA  
October 13-15, 2015  
[http://nwvspe.org/regionalmeeting.html?\\_ga=1](http://nwvspe.org/regionalmeeting.html?_ga=1).

For a complete list of industry news, recent white papers and case studies please visit our website [www.adv-res.com](http://www.adv-res.com) or contact one of our offices:

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