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Online Bimonthly RPSEA Member Newsletter

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President's Perspective

First, we're thrilled to have Dr. Steve Holditch assume our chairmanship. Leadership matters, and at RPSEA, we've been fortunate to have had great chairmen, beginning with Dr. Dan Lopez, president of New Mexico Institute of Mining and Technology, who was our first chairman. Dan's keen insight guided us through our challenging formative period. Dan was succeeded by Mark Murphy, the president of Strata Production Company, an independent producer in Roswell, New Mexico. We owe a special thanks to Dan and, now, especially to Mark for their significant contributions to where we are today. Mark's proven business acumen and vast experience in political and governmental affairs has been instrumental in the critical start-up period of our operations. The Board of Directors chair is a job that requires leadership, passion and special skill not possessed by everyone. Thanks to each of these fine men.

Second, we welcome Hani Sadek with Chevron Corporation as the new vice president of our Ultra-Deepwater (UDW) program. As you know, Chevron is contracted to manage our UDW program through its DeepStar consortium, the largest deepwater technology development consortium in the world. Hani will serve in the dual role of DeepStar Director and RPSEA UDW Vice President, leveraging a highly capable network of deepwater subject matter experts. With Hani's arrival, we thank Chris Haver for his two years of service in the same role as he makes his way to South America for a new assignment with Chevron.

It's hard to believe we've now submitted to NETL our fourth Draft Annual Plan (DAP) for our 2010 research year. NETL will contribute its input into the plan, and we'll start another round of Federal Advisory Committee (FACA) meetings in San Antonio September 14-16. These meetings are open to public, and you are welcome and encouraged to attend to get a better picture of what we're doing and what our upcoming research plans are.

We've completed our member forum series as input for our 2010 DAP. This marks the beginning of a significant transition from mostly input and planning to more output and execution as our project activity continues to ramp up. We now have 42 projects in research, with another 28 or so projects in the contracting phase soon ready to commence.

Our recent Member Meeting in Chicago, hosted by the Gas Technology Institute, was well attended. We were very fortunate to have Dr. Vic Der, the acting assistant secretary for Fossil Energy at the Department of Energy, as our keynote speaker. Vic was treated to an excellent presentation on our New Albany Shale project, a project which exemplifies the collaboration and integration we strive to achieve in most of our projects. Successful integration makes the whole greater than the sum of the parts, or as I like to say 1+1=3.

Finally, we are currently preparing our 2009 requests for proposals for release in August of this year. We look forward to your continued participation, either proposing or participating, in these unique and innovative solutions to maximizing the value of our abundant domestic resources.



C. Michael Ming
President

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Board of Directors Elects New Chair

The RPSEA Board of Directors elected Dr. Stephen A. Holditch, head of the Harold Vance Department of Petroleum Engineering at Texas A&M University, as the Board of Directors Chair effective June 30, 2009. Dr. Holditch succeeds Mark Murphy, president of Strata Production Company in Roswell, N.M., who completed a two-year term. The organizational bylaws stipulate that the chair position alternate between industry and academia every two years.

On the newly elected chair, RPSEA President C. Michael Ming commented, "Steve has served on the RPSEA Board since our inception and has served as the chair of the RPSEA Strategic Advisory Committee for the last three years. Along with his commitment to the RPSEA mission, Steve has had a distinguished career and brings an array of experience in the oil and gas industry and academia to the RPSEA Board. Steve has been a pioneer in many of the technologies associated with unconventional resources, especially hydraulic fracturing. It is an honor for us to obtain his leadership. Also, it has been an honor for us to have had the capable leadership of Mark Murphy over the last two years. Mark is a highly regarded businessman and independent producer with extensive experience in government and political affairs, and the organization has greatly benefited from his vision and guidance."



After receiving his bachelor's, master's and doctorate from Texas A&M University, Dr. Holditch joined the faculty there in 1976 and was named Head of the Petroleum Engineering Department in 2004. He was the Society of Petroleum Engineers International (SPE) President in 2002, SPE Vice President-Finance and a member of the SPE Board of Directors from 1998-2003. In addition, he served as a Trustee for the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) from 1997-1998. In 1995, he was elected to the National Academy of Engineering (NAE) and in 1997 to the Russian Academy of Natural Sciences. In 1998, Holditch was elected to the Texas A&M Petroleum Engineering Academy of Distinguished Graduates. Also, he was elected as an SPE and AIME Honorary Member in 2006.

"This is an opportunity to increase my involvement with RPSEA and to focus on the technology we need to produce more natural gas and oil from unconventional reservoirs and the ultra-deepwater environment," Dr. Holditch said. "RPSEA is extremely important to the 25 research universities, who are members of RPSEA. These universities are educating the professionals that America needs to find and develop domestic hydrocarbons to meet the needs of the USA."

Please join RPSEA in extending our appreciation of outgoing Board Chair Mark Murphy for his contributions the past two years and congratulating Dr. Stephen Holditch to the position!

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Vice President Ultra-Deepwater Rotates Leadership

The RPSEA Ultra-Deepwater Program is managed by Chevron's DeepStar division. DeepStar's director fulfills the role of vice president of RPSEA's Ultra-Deepwater Program, with the role rotating generally every two years. Outgoing Vice President Ultra-Deepwater Christopher Haver has moved to a new position within Chevron, and Hani Sadek has assumed his role at DeepStar and RPSEA.

Sadek is a graduate of The University of Texas at Austin with a degree in petroleum engineering. He grew up in Houston, when the oil and gas industry was "booming" and the local economy was directly linked to Houston and all its swings. He began his career with Mobil working in New Orleans as a drilling engineer in the Gulf of Mexico. After a couple of years learning the ropes, challenging assignments soon had him working in Norway, Nigeria, North Africa and the North Sea. In early 2000, Sadek joined Chevron with a short stint in Houston, and then, his international journeys and assignments continued with various challenging projects working in Angola, Kuwait and, most recently, in Indonesia. Outside of work, he is an avid golfer and continues to work on his game in the hopes of adding to his two holes-in-one. He resides in Horseshoe Bay, Texas with his wife of 17 years, Pauline, and his son, Wesley.



What is your background, expertise, and thoughts on the future of our energy needs?

"I am a petroleum engineer by education, but most of my career has been spent in drilling and completion operations. I began my career working in the Gulf of Mexico and shortly thereafter started working international in most of the major global oil and gas producing regions. My expertise is in drilling operations in offshore, deepwater, land and geothermal environments. My international experience has given me a unique perspective on how certain countries manage their oil and gas industry, and how in many cases, funding of projects, research and technology development is done so differently than in the U.S. Oil and gas companies working in the U.S. are at a definite disadvantage as most of all R&D funding is from the private sector and most often funded by individual companies on unique projects. This tremendous cost and inefficiency ends up being directly reflected in the final cost to produce hydrocarbons and on to the consumers. Technological development and advancement has never been as important or costly as it is today to meet our future energy needs. Oil and gas remains our most cost effective energy source, but the cost of developing deepwater projects is challenging our economics like never before. Unique organizations like DeepStar and RPSEA have proven to be the best way to achieve successful technology development, demonstration and deployment thru maximizing cooperative, industry-led efforts that meet their actual business needs. However, equally important is a long-term plan and commitment for funding technology that has cost sharing drivers. EAct 2005 has set the framework for such funding thru the RPSEA organization and will hopefully continue to be supported by public policy in the future. These two closely linked organizations can also play a key role in the development of our future resources while continuing to improve safety and have less impact on the environment. I am proud of how our industry has continued to make great strides in improving its HES footprint over the past 25 years, but certainly more can be done to achieve incident free operations thru new technology."

Please join RPSEA in welcoming Hani to the RPSEA team!

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2010 Draft Annual Plan Sets Program Focus

RPSEA has completed its 2010 Draft Annual Plan (DAP), a component of the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Research and Development Program Annual Plan established to the Energy Policy Act of 2005 (EAct).

A DAP is written and submitted by RPSEA and is used as the input for a final Annual Plan that must be approved by the Secretary of Energy each year. The 2010 DAP is an evolutionary document building upon the foundation of the 2007 through 2009 approved Annual Plans. At this stage of RPSEA's program, the objectives are: the continued aggressive engagement of the private sector and research communities to enhance the value of the public/private partnership; a focus on building, maintaining, and managing the optimal portfolio contemplated by the original DAPs; and, the transition from planning to execution of the plans. Each of the three RPSEA program portfolios, ultra-deepwater, unconventional resources and small producer, have developed according to plan, and the 2010 DAP continues that evolution to build the foundation required for optimal portfolio composition.

Once the 2010 Annual Plan is approved, funding follows for the 2010 year and requests for proposals follow within each of RPSEA's programs. This year marks the beginning of a regular cycle of predictable annual plans and approval, as RPSEA and NETL have worked together to "catch up" on the cycle with our upcoming requests for proposals later this summer.

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Welcome New Members

RPSEA is proud of its membership base that has grown to more than 145 members in the two and half years the program has been in operation. Being a two-step process, membership is approved first internally through RPSEA, and second by the Secretary of Energy quarterly.

Ten new organizations were approved for RPSEA membership just recently. The following list includes all organizations that applied for membership during the first two quarters of 2009.

Campbell Applied Physics, Rancho Murieta, Calif.
Deepwater XLP Technology, LLP, Houston
Granherne, Inc., Houston
Intelligent Agent Corporation, Houston
National Oilwell Varco, Inc., Houston
QO, Inc., Houston
Quest Integrated, Inc., Kent, Wash.
Southern Methodist University, Dallas
University of Colorado at Boulder, Boulder, Colo.
Wright State University, Dayton, Ohio

RPSEA welcomes and is proud to be affiliated with the above organizations. For a list of all RPSEA members, [click here](#).

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Calendar of Events

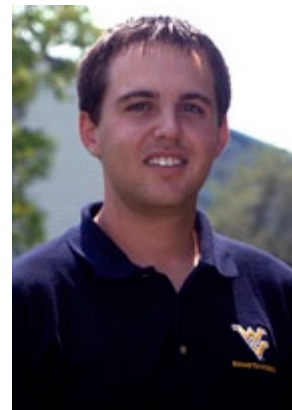
8.27-28	Summer NAPE, Houston
9.8	Ultra-Deepwater Floating Facilities TAC Quarterly Meeting, Bellaire, Texas
9.9	Ultra-Deepwater Subsea Facilities TAC Quarterly Meeting, Bellaire, Texas
9.10	Ultra-Deepwater Flow Assurance TAC Quarterly Meeting, Bellaire, Texas
9.14-16	Federal Advisory Committee Meetings (FACA), San Antonio, Texas
9.16	Ultra-Deepwater Drilling & Completion TAC Quarterly Meeting, Houston
9.17	Ultra-Deepwater Systems Engineering TAC Quarterly Meeting, Houston
9.22	Ultra-Deepwater Reservoir Engineering TAC Quarterly Meeting, The Woodlands, Texas
9.22	Ultra-Deepwater Geoscience TAC Quarterly Meeting, The Woodlands, Texas

Click here for more information, to register and the [complete calendar](#).

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Fellowship/Scholarship Program Recipient Spotlight

RPSEA created the Fellowship/Scholarship Program to establish long-term industry/education partnerships. RPSEA members Schlumberger and Strata Production designate financial resources through RPSEA to award multiple scholarships to the following member universities: Colorado School of Mines, Louisiana State University, New Mexico Institute of Mining and Technology, Stanford University, Texas A&M University, The University of Texas at Austin, The University of Oklahoma and West Virginia University. The most promising students with studies relevant to the oil and gas industry are awarded fellowships to help with their education and/or research activities. Through private funding from these two members, \$240,000 is established for these member universities to provide much needed support for 16 students per year for three years.



West Virginia University graduate Ross Schweitzer was awarded a fellowship through the Fellowship/Scholarship Program for the 2008-09 school year. RPSEA spotlights Schweitzer this month in the following interview, while wishing him success in his new position with RPSEA member Devon Energy Corporation.

1. What was the title of your dissertation?

A Study of the Effects of Well and Fracture Design in a Typical Marcellus Shale Well

2. Where did your project take place?

Morgantown, West Virginia

3. What school were you attending during the fellowship?

West Virginia University

4. What was your degree and major while working on the fellowship?

Master of Science in Petroleum and Natural Gas Engineering

5. What was the time frame spent on the entire project?

The total time was two years from the start of graduate school, from 08/07 to 05/09.

6. Why did you pick this focus for your project?

Initially, I was planning on doing a refracture study with data from the company where I had been interning. However, due to restricted information of the newly developing Marcellus formation and the difficulty in modeling refractures in shale, that was unable to happen. Therefore, since I was already working in the Marcellus, I conducted simulations using Schlumberger's Eclipse software. Many runs were conducted with varying well design and fracture types in the Marcellus, followed by an economic analysis.

7. What were the major accomplishments of your project?

The project as a whole was a great accomplishment, but the results were the most interesting. It was found that the horizontal wells were more economical than vertical wells in the play as expected, along with fracture half length being a key parameter in the economic analysis. It was shown that the more money spent up front in larger fracture half lengths and longer laterals created a more economical well in the long run.

8. How did RPSEA help you achieve your project goals?

RPSEA helped me out tremendously; I cannot express my appreciation enough. The funding through RPSEA allowed me to further my education, without any strain to my finances. The opportunity allowed me to earn my master's in PNGE and move into the energy industry.

9. How have you grown both personally and professionally from your fellowship with RPSEA?

RPSEA has allowed me to grow through its generous contributions to further my education and better myself in my life and in my career. The opportunities for my professional growth and personal well being are going to be from the start that RPSEA has given me. Hopefully, I will be working in the energy business for the rest of my life.

10. What is your role today?

I just started working for Devon Energy as a drilling engineer, working in the Barnett Shale. I also plan to continue my education and work towards a master's in business administration.

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Small Producer Project Highlight

Near Miscible CO₂ Application to Improve Oil Recovery for Small Producers

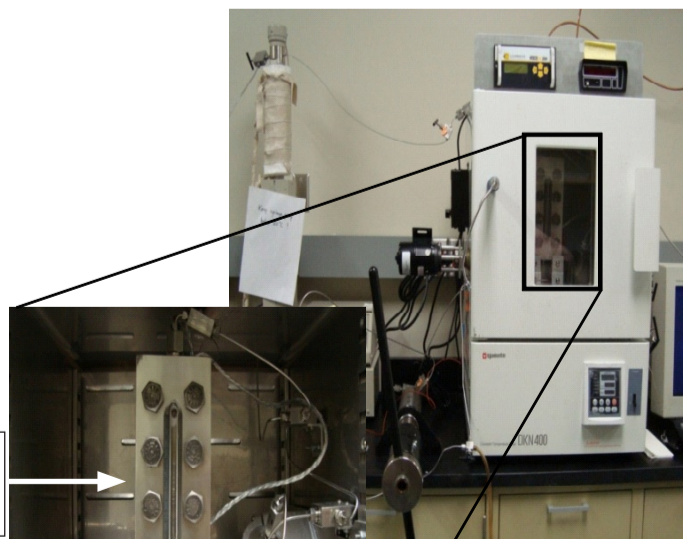
Principal Investigator: Dr. Jyun Syung Tsau, The University of Kansas

Partner: Carmen Schmitt

Many reservoirs in the United States and around the world are at shallow depths, or geologic conditions exist such that they operate at pressures below the minimum miscibility pressure (MMP). The goal of this project is to demonstrate whether miscible CO₂ application can substantially increase oil productions with CO₂ injection at pressures below MMP. Successful application of CO₂ injection at near miscible conditions may lead to development of CO₂ projects for small producers in reservoirs where the MMP is not attainable at current operating reservoir pressures.

Phase behavior studies on CO₂/crude oils are in progress and near completion. This task includes slim-tube tests for MMP measurements, swelling and extraction tests, density and viscosity measurements, as well as construction of phase behavior model for the reservoir simulation. Tests have been run on oil from the Ogallah Unit, which produces from the Arbuckle reservoir in central Kansas. Slim tube tests have shown that at reservoir temperature, 110°F, the MMP for this oil was 1350 psig. At this temperature, swelling tests indicated the maximum change of oil volume by swelling was 20.7%. At near miscible conditions with the pressure ranging from 1150 to 1350 psig, extraction is a primary mechanism for mass transfer between CO₂ and oil. At this near miscible condition, viscosity of oil was reduced by a factor of 5 as a result of CO₂ dissolution.

A phase behavior model was developed to match PVT experiment and MMP in the slim-tube experiment. Peng-Robinson EOS was tuned against experimental data. The figure shows an example of where the phase behavior model successfully matches MMP measured by slim-tube tests. The red squares are experimental data at different pressures while the open circles represent the modeling results. The MMP, 1350 psig, is determined as a pressure at which the oil recovery reaches 90% at 1.2 PV of CO₂ injections.



High Pressure View Cell to observe phase behavior of CO₂/crude oil

Viscometer to measure viscosity

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Ultra-Deepwater Project Highlight

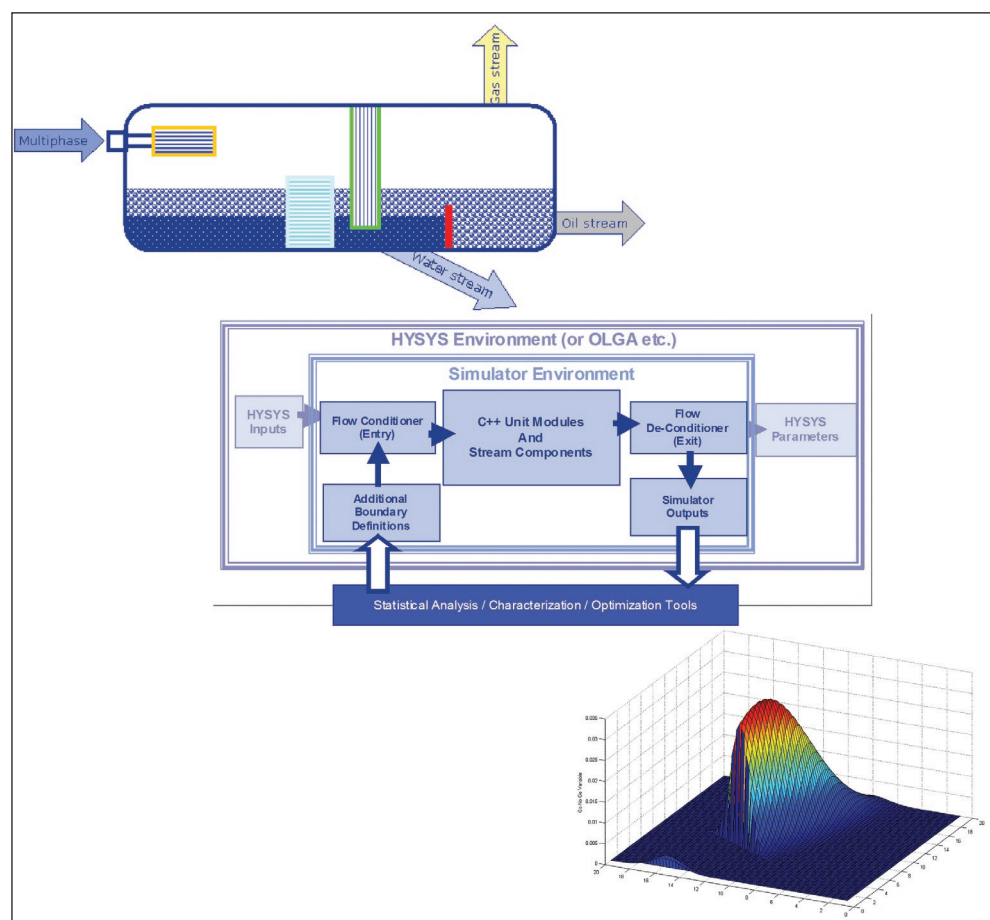
Subsea Processing System Integration Engineering

Principal Investigator: Christopher Wolfe, GE Global Research

Partner: GE/VetcoGray

The objective of the program is to develop a process simulation tool (Simulator) suitable for modeling Subsea Processing Systems (SSP). The goal is to have the Simulator become the industry standard to evaluate SSPs performance and bridge TRL gaps between operation engineers and facility suppliers. The deliverables of this first phase of the program are the Simulator architecture, a functional Simulator including some unit models and procedures for users to incorporate their own models and a validation facility for use with model oils.

The Simulator is designed to allow high fidelity simulation of subsea processing within the context of general process simulator tools currently in use by the oil and gas industry. The Simulator receives stream data from the process simulator (e.g. OLGA, HYSYS) and has facilities to augment this data with specific properties relevant to separation that are not necessarily carried by the process simulator (fluid electrical properties, TAN, solids properties, asphaltene, wax, resins contents, scale/inorganic solids, salts, etc.). Then, the Simulator simulates the separation process under consideration and returns the resultant outputs back to the process simulator domain downstream of the separation system.



Within the Simulator environment, the separation processes are modeled by assembling unit models (demisters, coalescers, pipes, flow splitters, gravity or cyclonic separators, valves, and the like), process models (sensors, valves, and other controls), and rheological behavior models (emulsions) from a library. A hierarchical organization will allow creation of systems of systems down to layered submodels of increasing complexity and fidelity to allow tailoring the simulation expense and accuracy to the resources available and requirements of that simulation.

The Simulator is being developed on two fronts: first a bottoms-up implementation in MATLAB as an internal sandbox version for development of algorithms and models, and a top-down C++/NPSS version to be developed into the final tool. The architecture for both fronts is complete; the next steps will be to develop the unit and fluid models.

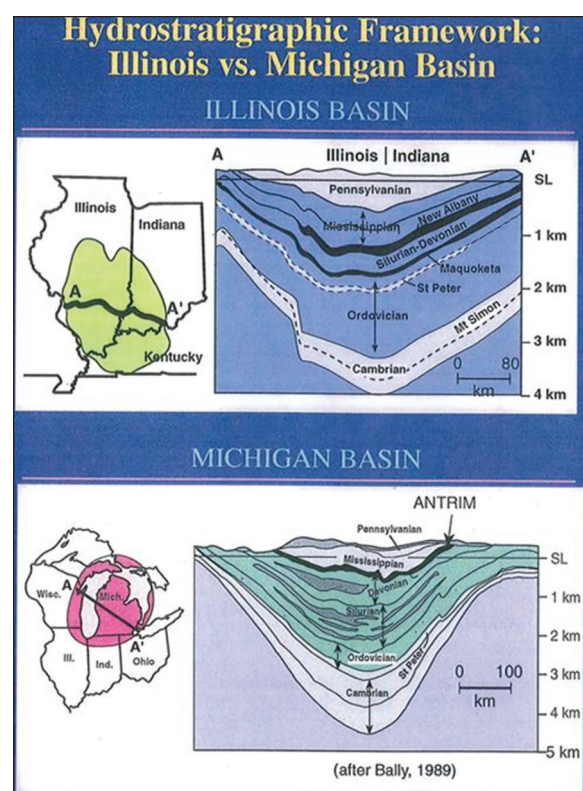
One key feature of the Simulator is a collection of statistical wrappers that can drive the simulator kernel over various cases and, then, post-process the resulting data to determine operability envelopes of the system, as well as probabilities of successful operation per user supplied performance criteria. This infrastructure can also be used as a design tool to optimize designs and determine key causes and effects. The statistical package will be able to drive the simulator directly via the flow conditioners or may dictate boundary conditions to the outside process simulator.

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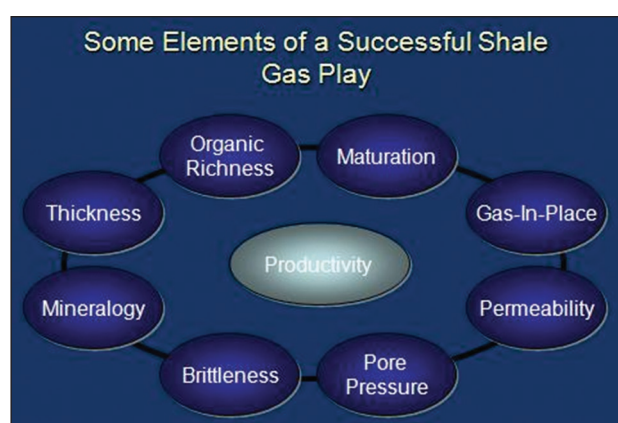
Unconventional Resources Project Highlight

RPSEA Members Meeting and New Albany Shale Technology Forum

RPSEA conducted a Member Meeting and a Mid-Century Gas Shales Forum on June 4 in Chicago. The RPSEA Member Meeting included an update on RPSEA activities in the Ultra-Deepwater, Unconventional Resources and Small Producer programs. The Mid-Century Gas Shales Forum, with a focus on New Albany shale technology, included results from the RPSEA New Albany Shale research project and two producer presentations addressing other gas shale resources in the Mid-Century area of the United States.



Elements of a Successful Shale Gas Play – Presented by Dr. John Curtis, Director Potential Gas Agency



Topics included:

- Geologic Insights - Bureau of Economic Geology, The University of Texas at Austin
- Reservoir Engineering - Texas A&M University
- Formation Evaluation Issues - ResTech
- Hydraulic Fracturing - Pinnacle Technology
- Sourcing of Gas in Shales, Biogenic or Thermogenic - Amherst College
- New Albany and Antrim Shale Producer Perspective - Aurora Oil and Gas
- New Albany and Appalachian Shale Producer Perspective - NGAS

Featured speakers included:

RPSEA President C. Michael Ming opened the meeting with an update on RPSEA activities and the importance of energy research for economic development of our natural gas resource endowment in the United States.

Acting Assistant Secretary, Office of Fossil Energy, Dr. Victor K. Der was the luncheon keynote speaker providing an overview of fossil energy priorities under the Obama administration.

Dr. John Curtis with the Potential Gas Agency at the Colorado School of Mines provided a perspective on the history of gas shale development from “onerous stepchild” to “premier resource.”

The complete set of presentations can be found on the [RPSEA website](#).

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