



**Research
Partnership to
Secure Energy
for America**

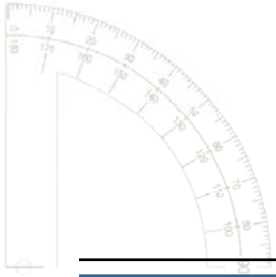
**C. Michael Ming
Annual Member Meeting
Sugar Land, Texas
August 29, 2007**

Secure Energy for America

The Energy Policy Act of 2005 And Section 999:

A Public/Private Partnership for R&D in the Ultra-Deepwater in the Gulf of Mexico and in Unconventional Onshore Natural Gas and Other Petroleum Resources of the United States.



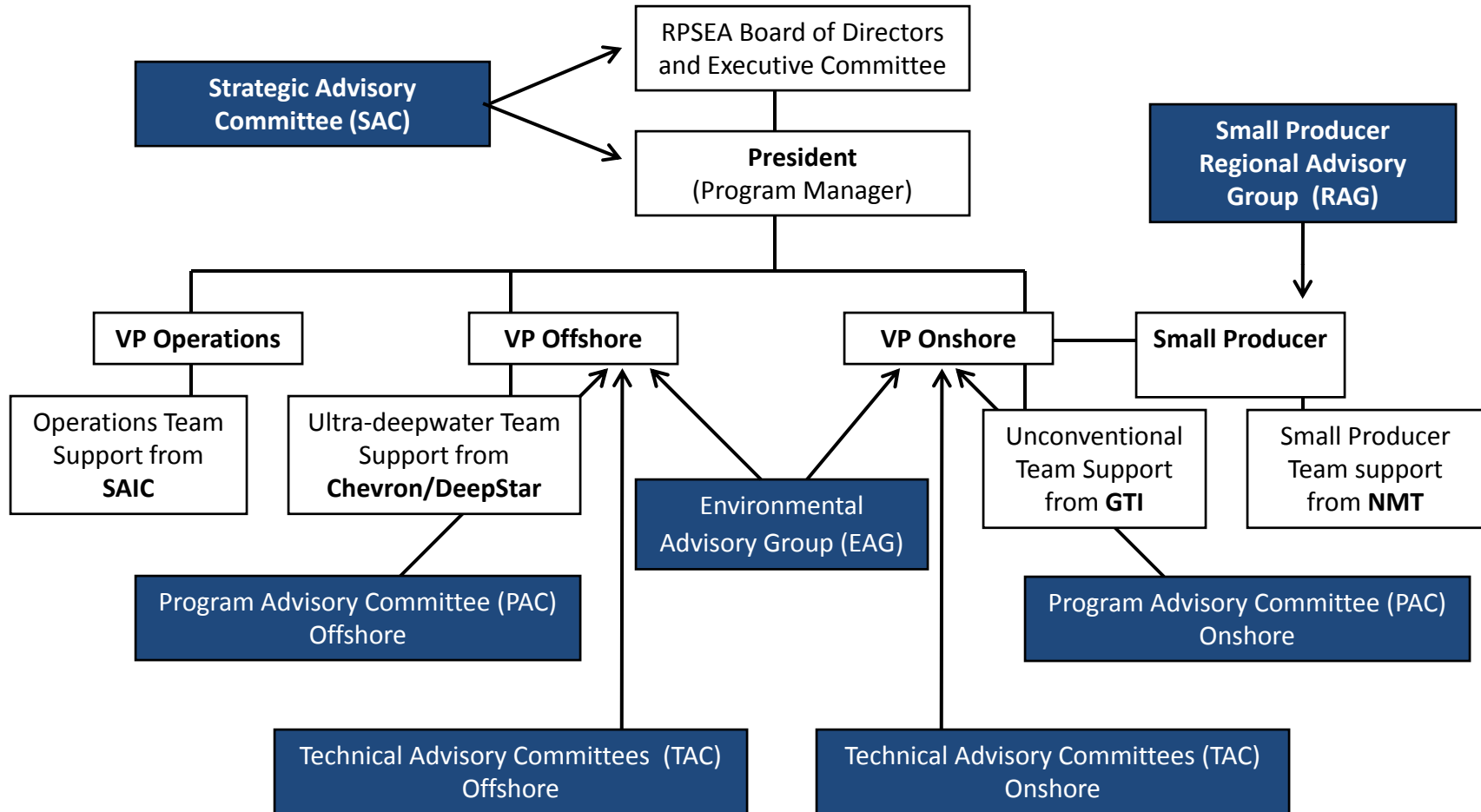


The RPSEA Organization

-
- A Research Partnership
 - A Research Co-op
 - A 501(c)3 not for profit
 - Competitively selected by DOE as the Section 999 Consortium Manager
 - 117 Members and growing

For more information visit www.rpsea.org

A Small Organization, A Large Network



Well over 1,000 experts have participated in this process!

Secure Energy for America





The Energy Policy Act of 2005 And Section 999:

Research, development, demonstration, and commercial application of technologies for:

- **Ultra-deepwater – technology and architecture focus**
- **Unconventional natural gas and other petroleum resource exploration and production – resource focus**
- **The technology challenges for small producers by consortia**

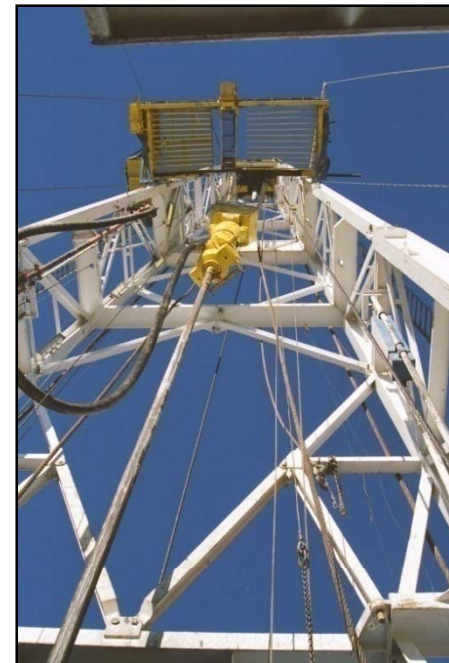
All while improving safety and minimizing the environmental impacts of activities within each area, including reduction of greenhouse gas emissions and sequestration of carbon



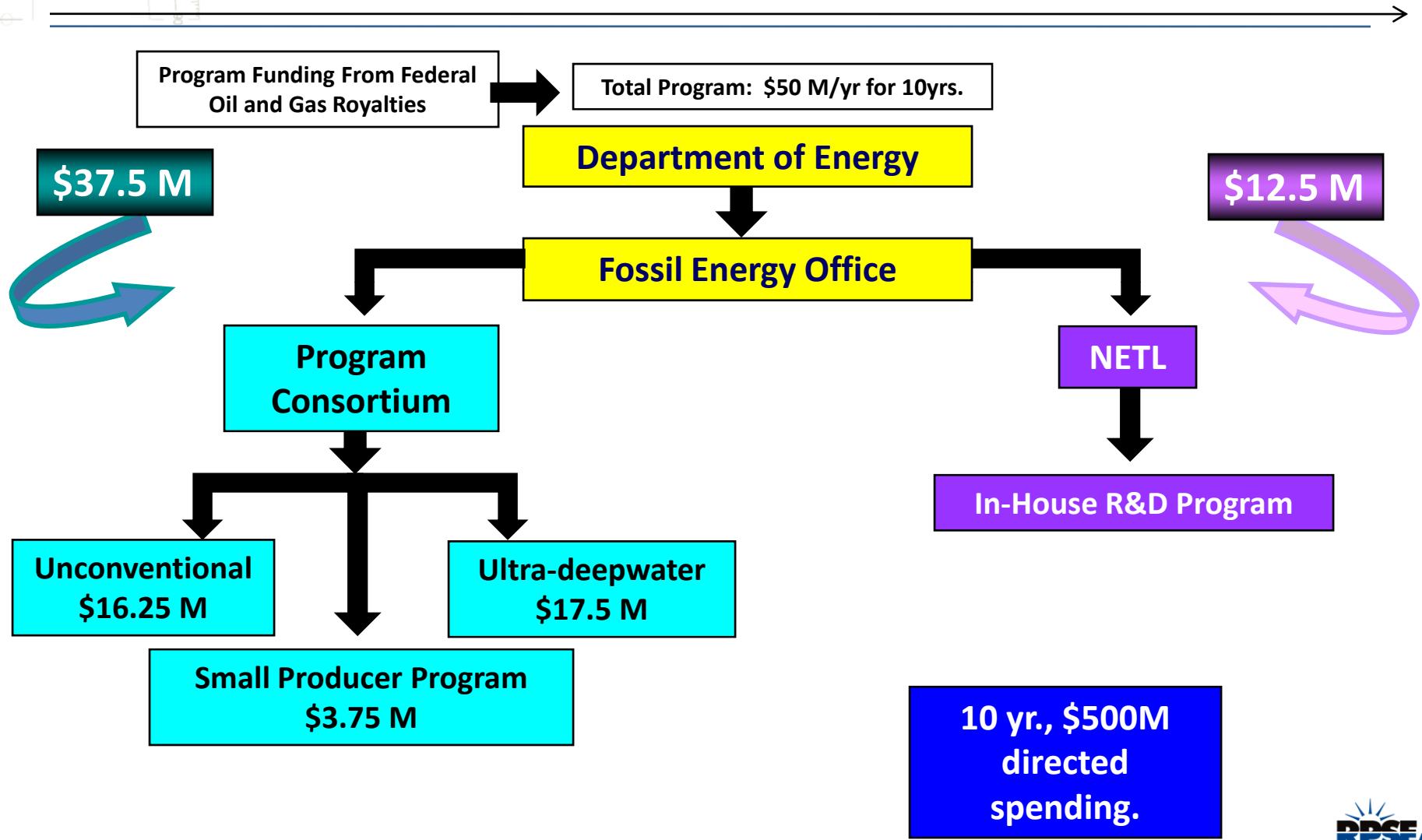
What is Section 999?

Specifically, the law directs --

- Research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas and other petroleum resource
- Maximize the U.S resource value by:
 - Increasing supply
 - Reducing the cost
 - Increasing E&P efficiency
 - Improving safety and minimizing environmental impacts



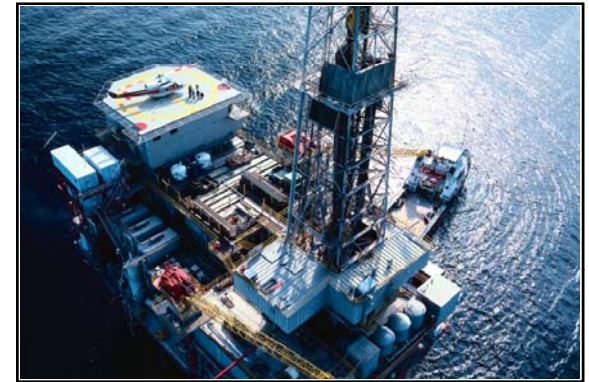
Current Program Structure/Funding



What is the Program's Focus?

The Program has four program elements:

- Ultra-deepwater 35%
(> 1500 Meters water or
15,000' OCS drilled depth)



- Unconventional Onshore 32.5%
(Economic accessibility)

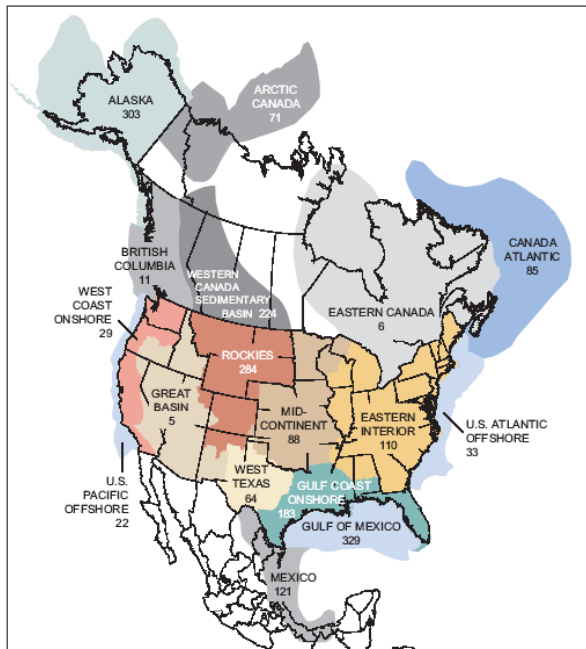
- Small Producers 7.5%
(< 1000 BOEPD)



- Complementary Program 25%

Managed by NETL

The Resources



NPC 2003 Technical Resources (TCF)

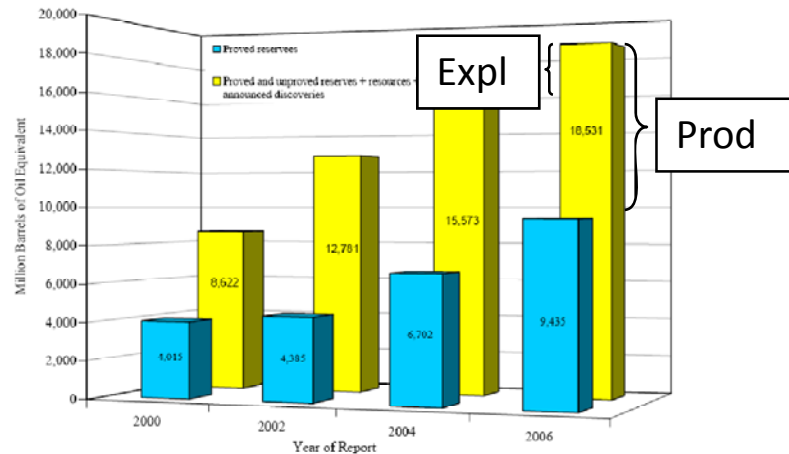
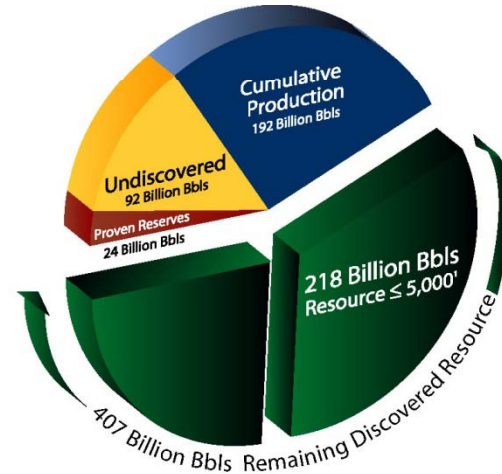
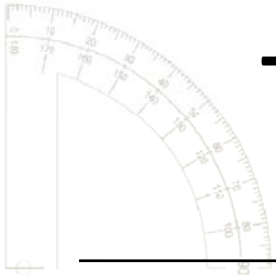


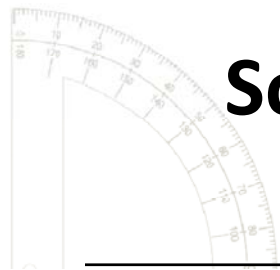
Figure 76. Comparison of 2000, 2002, 2004, and 2006 deepwater GOM reports: successive increases in deepwater BOE.



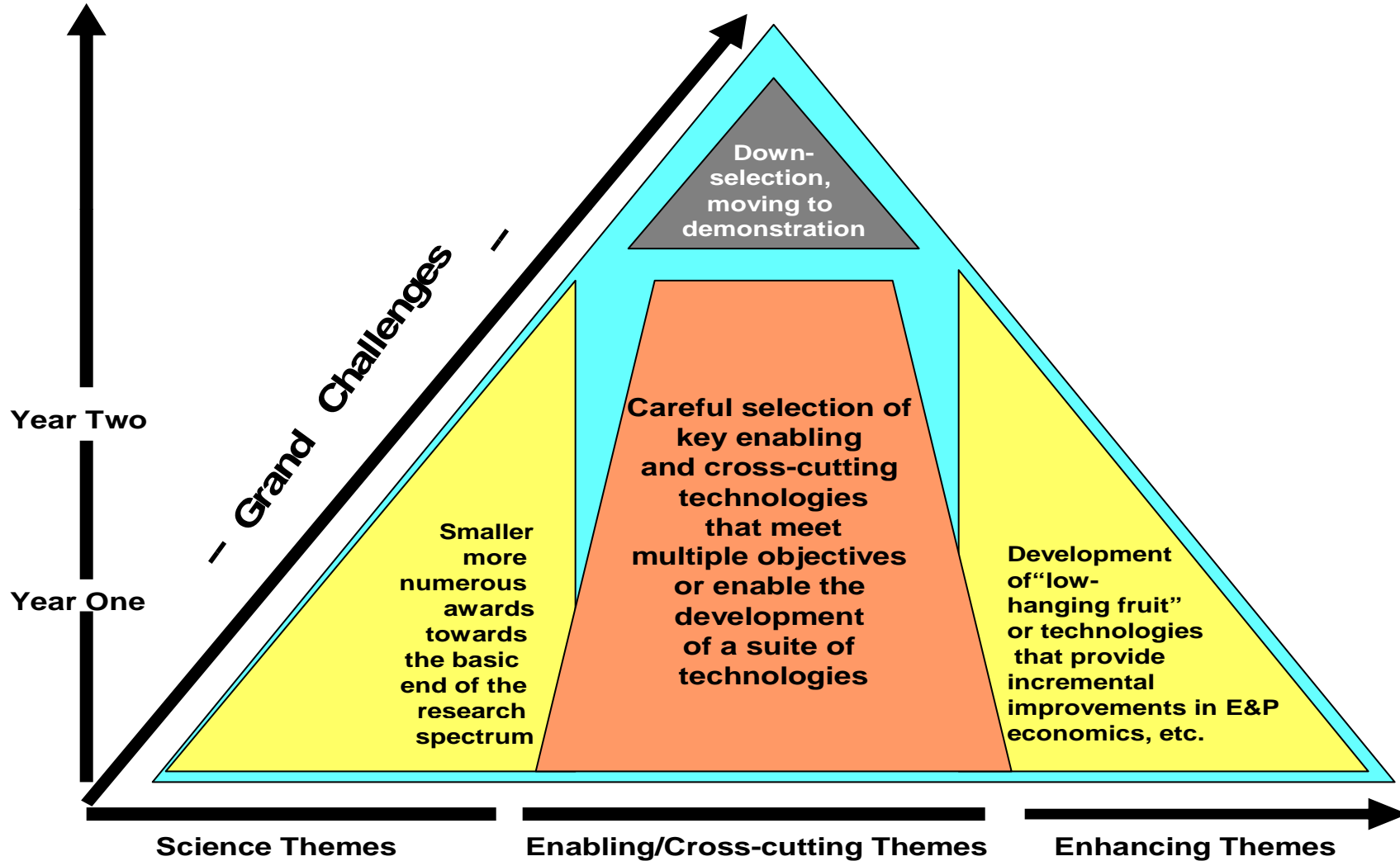
The RPSEA Process and Draft Annual Plan Basics :

- Today present resources, processes, inputs, and themes by program element
- Focus – 8 major theme areas
 - 4 Ultra-Deepwater field types
 - 3 Unconventional Onshore resource types
 - 1 Small Producer challenge
- Component themes under each major theme are identified
- There are many players in the process!

Some General Attributes of the Annual Plan



Years Five
thru Ten





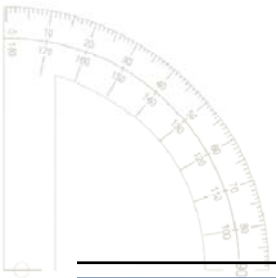
The 2007 Draft Annual Plan

- The Draft Annual Plan requires a 2/3 super majority vote of the RPSEA Board of Directors
- This overall process provided multiple input opportunities from well over 1,000 experts
 - Multiple Advisory Committees
 - Member forums
 - Broad member input through meetings
 - DOE et al road mapping workshops
 - NETL consultation throughout



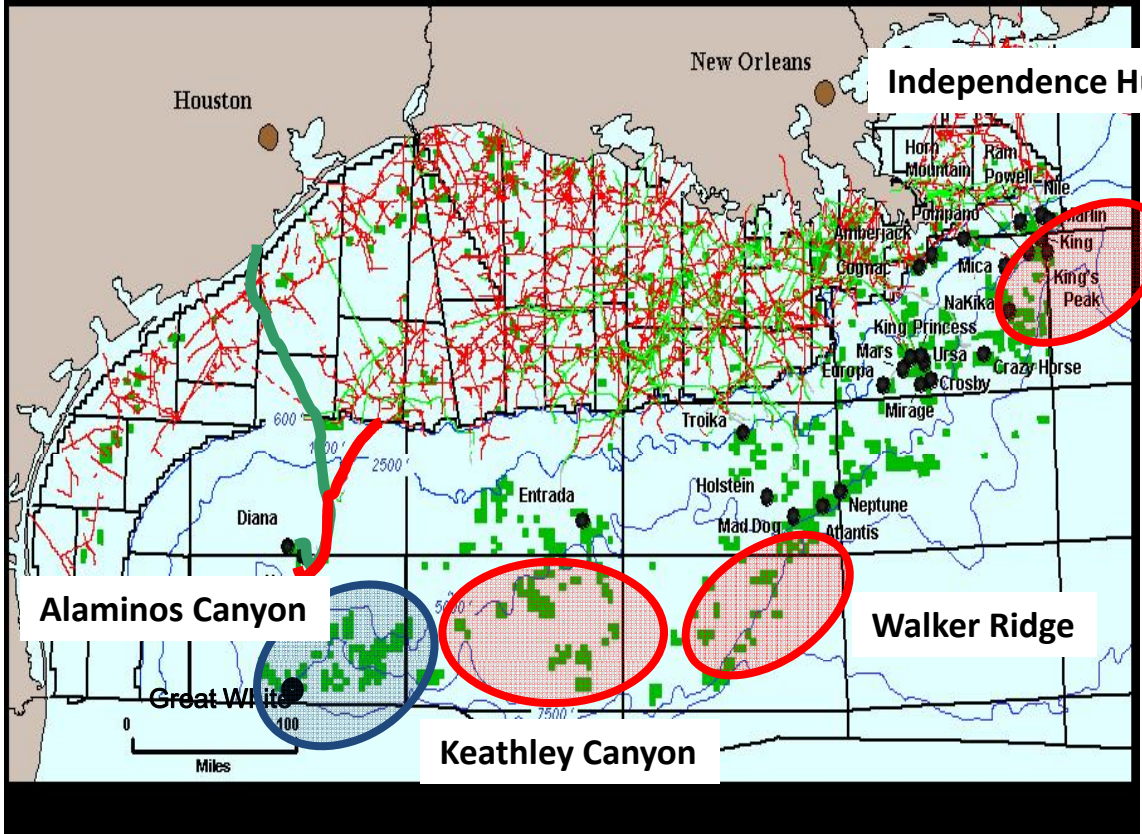
Some General Attributes of the Annual Plan

- Research should create leverage on
 - Funding, personnel, equipment, operations, and other resources
- Integration is a key to create synergies
 - Make 1+1=3
- Research should be cumulative to mitigate risk and build upon itself
 - Build in multiple time scales for the research plan
 - Allow for failure
 - Leave more legacies than one time projects, and plan for follow on funding
- Focus on short to mid term applied projects
 - Integrate with the NETL complementary program for more basic longer term projects
- Identify opportunities industry can't tackle or are impractical for industry to tackle
- Avoid many small projects which minimizes the potential for high impact



GOM Deepwater Trends

- Walker Ridge /Keathley Canyon
 - Sub-salt
 - Deeper wells
 - Tight formations
- Alaminos Canyon
 - Viscous crude
 - Lacking infrastructure
- Eastern Gulf – Gas Independence Hub
 - Higher pressure
 - Higher Temperature
 - CO2 / H2S
- Higher Drilling Costs
- Challenging Economics



Unconventional Onshore Themes



■ Gas Shales

- Rock properties/Formation Evaluation
- Fluid flow and storage
- Stimulation
- Water management

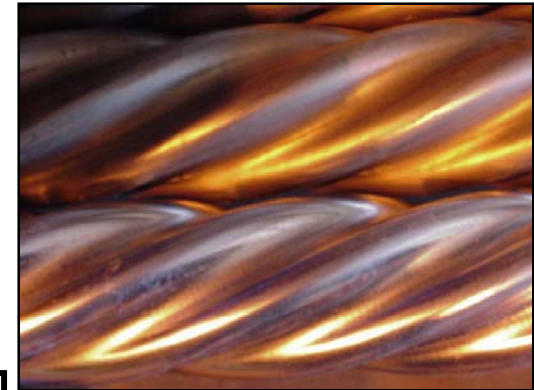
■ Coalbed Methane

- Produced water management

■ Tight Sands

- Natural fractures
- Sweet spots
- Formation Evaluation
- Wellbore-reservoir connectivity
- Surface footprint

**Cost Reduction
in All Aspects of
Operations**





The Technology Challenges of Small Producers

Focus Area – Advancing Technology for Mature Fields

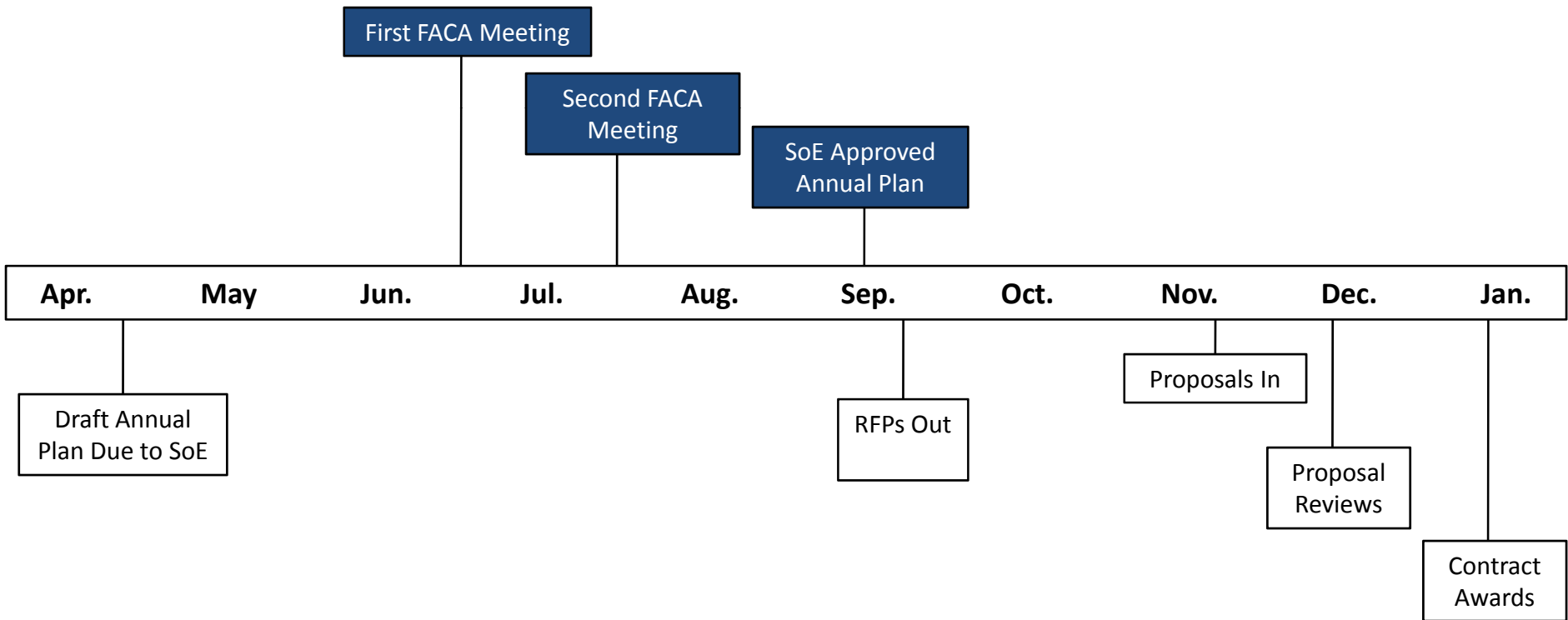
- Target – Existing/Mature Oil & Gas Accumulations
 - Maximize the value of small producers' existing asset base
 - Leverage existing infrastructure
 - Return to production of older assets
 - Minimal additional surface impact
 - Minimize and reduce the existing environmental impact
- Lower cost and maximize production



When do things happen?



RPSEA – Estimated Program Timeline





RPSEA Strategic Initiatives

- Fellowship/Scholarship Program
- Hart's "RPSEA GasTips" Magazine
- Young Professionals in Energy
- Natural Carbon Innovation Center
- Strategic Alliances
 - Local alliances – HTC, Rice, et al
 - State and national producer associations
 - International partnerships - Demo2000
- Intern Program
- Exploring Additional Resource Cost Share
 - Executive on loan type opportunities

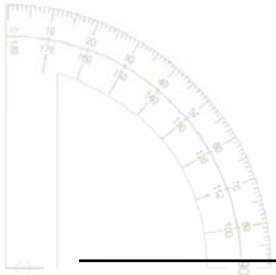


What Can You Do?

- Support the effort:
 - Promote the open innovation model
 - Encourage others to join RPSEA
 - Participate in the process
 - Provide input, proposals, or cost share
- Get involved and educated in energy
- Support workforce development efforts and science and engineering in K-12 & college

There's some urgency here!





“You miss 100% of the shots
you don’t take.”

Wayne Gretzky

QUESTIONS?



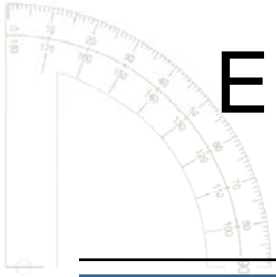
NETL Complementary Program

- Drilling Under Extreme Conditions
- Environmental Impacts of Oil and Natural Gas Development
- Enhanced and Unconventional Oil Recovery
- Resource Assessment



Drilling Under Extreme Conditions

- Deep and Ultra-deep (15,000' & 25,000') applications
- HPHT materials & fluids
- HPHT sensors, & electronics
 - 350 deg C
- Numerical modeling capabilities
- ROP
 - Ultradeep single cutter Drilling Simulator
 - 30,000 psi & 250 deg C



Environmental Impacts of Oil and Natural Gas Development

- Produced water management
- Disposal of produced water from coal bed natural gas
- Onshore access restrictions based on environmental stipulations developed without adequate scientific research
- Air quality relating to oil and gas development.
- Access to CO2 and capture technology for EOR
- Oil shale resources



Enhanced and Unconventional Oil Recovery

- Creation of a high quality digital database of reservoir characterization data for EOR, oil shale and tar sand resources
- Completion of basin characterization models
- Development of better model algorithms
- Development of new additives and catalysts
- Development of new uses for the spent shale byproduct of surface oil shale processing
- Development of more efficient, cost effective, high resolution, disposable downhole sensors
- Development of materials and techniques that will enable economic CO₂ and thermal flooding to be applied in a larger number of mature fields.



Resource Assessment

- *Resource Characterizations* – Conduct detailed regional geologic analyses including emerging, overlooked, or underutilized resources and assemble existing studies of offshore resources and determine an estimate of the resources available in offshore areas, including those not open for access.
- *Technology Assessments* – Analyze the results of these resource characterizations to identify opportunities where technological advances could unlock currently untapped resources.
- *Technology Transfer* – Work with organizations such as PTTC, SWC, and RPSEA to realize the development or adoption of the most promising technologies, and develop a repository of all of the information developed as well as other ongoing DOE oil and gas programs, including the option of a Knowledge Management Database.