National Energy Technology Laboratory Strategic Center for Natural Gas

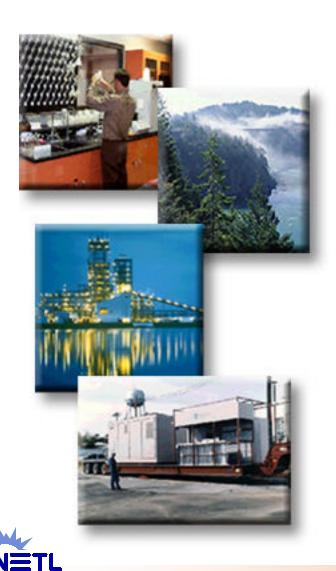*Natural Gas Storage R&D Planning Workshop*

Hyatt Regency Pittsburgh, PA November 29, 2001

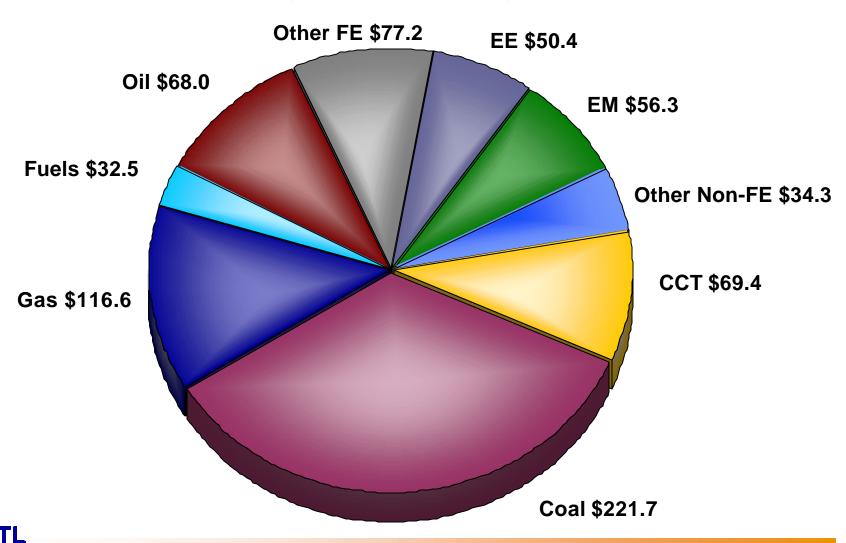**Brad Tomer, Product Manager**
Gas Exploration, Production & Storage

NETL

- **One of DOE's 15 national laboratories**

- **Government owned and operated**

- **Sites in Oklahoma, Pennsylvania, West Virginia**

- **1150 federal and support contractor employees**

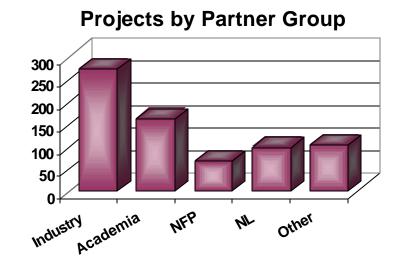- **Primary focus is managing external Fossil Energy R&D**

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NETL FY01 BUDGET
($726.6 Million)

Other FE $77.2

EE $50.4

Oil $68.0

EM $56.3

Fuels $32.5

Other Non-FE $34.3

Gas $116.6

CCT $69.4

Coal $221.7

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Shape, Fund, and Manage Extramural RD&D

- **Over 800 research activities in all 50 states and 16 countries**
- **Total award value of $7.3 billion**
- **Research performers include:**
  - Private industry
  - Universities/colleges
  - Not-for-profit labs
  - Other DOE national labs
  - Others
- **Private sector cost sharing of $3.9 billion**
  - Leverages DOE funding
  - Ensures relevance
  - Mission accomplishment only through commercialization
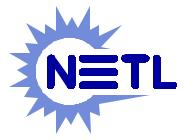- **55 active MOU's and MOA's**

Projects by Partner Group

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Five RD&D Activity Clusters

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Borehole to Burner Tip

Electric Power Using Coal
Mining to Light Switch

Energy Policy Support
A Key Issue in Use of Fossil Energy

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Environmental Quality/ Defense Programs
Supporting the DOE Complex

Oil Supply

Fuels

Supply and Delivery of Clean Fuels for Transportation/Other End Use Sectors

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Strategic Center for Natural Gas

Strategic Center for Natural Gas

Vision:

By 2020, U.S. public is enjoying benefits from an increase in gas use:
- Affordable supply
- Reliable delivery
- Environmental protection

Mission:

Be the focal point for an integrated gas program:
- Spearhead annual DOE-wide gas RD&D planning and program assessment
- Shape, fund, and manage extramural RD&D
- Provide science and technology advances through NETL's on-site programs
- Conduct studies to support policy development

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SCNG's Technology Portfolio
Borehole to Burner Tip

**Next Generation Gas Turbines
for Large Industries / Utilities**

- Flexible 30-300 MW turbine systems
- RAM improvements
- Supporting R&D

Distributed Generation

- PAFC - entering commercial market
- MCFC - high efficiency
- SOFC/SECA - low cost
- Hybrid turbine/fuel cell - ultimate efficiency
- Reciprocating engines - lowest cost

Gas Infrastructure Reliability

- Enhance pipeline safety and reliability
- Increase gas deliverability
- Increase operational flexibility of gas storage facilities

Gas Exploration & Production

- Resource and reserve assessments
- Improved diagnostic, imaging, drilling and completion technologies
- Hydrates, deep gas, off-shore

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Gas Storage Technology Areas

- **Conventional Storage Reservoirs**
  - Deliverability enhancement
  - Gas measurement
  - Reservoir management

- **Advanced Storage Concepts**
  - Lined Rock Caverns
  - Hydrates
  - Salt Caverns
  - Basalt Aquifers

Lined Rock Caverns

Gas Storage R&D Planning Workshop

- **Purpose**
  - Obtain industry perspective
  - Identify key barriers & R&D opportunities
  - Develop collaborative R&D action plan for next 2-5, 5-10, 10-15 yrs

- **Breakout Sessions**
  - Conventional A&B: Deliverability enhancement, reservoir & facility mgmt, inventory control from aquifers, depleted oil & gas reservoirs, salt caverns
  - Power/Distributed Generation: Gas storage to meet electric generation needs including alternative storage technologies

- **R&D Challenge**
  - Meet industry needs   -Collaborative in nature
  - System mindset   -Product focused

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Options for Continued Industry Participation

- **Advisory Panel**
  - Hydrates program
- **Roadmapping**
  - Infrastructure, hydrates, and many others
- **Cooperative Agreements**
  - Joint industry projects, individual firms, etc.
- **Industry-Driven Consortium**
  - Advanced turbines, carbon products, SWC
- **National laboratory partnership**
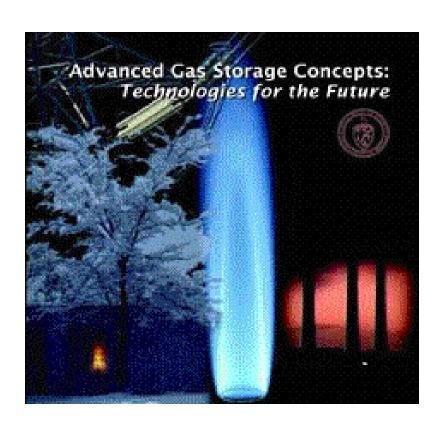 - NGOTP, hydrates, ultra-clean fuels

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Internet Location: netl.doe.gov/scng/index.html

Natural Gas Storage R&D Planning Workshop

Thank You For Participating