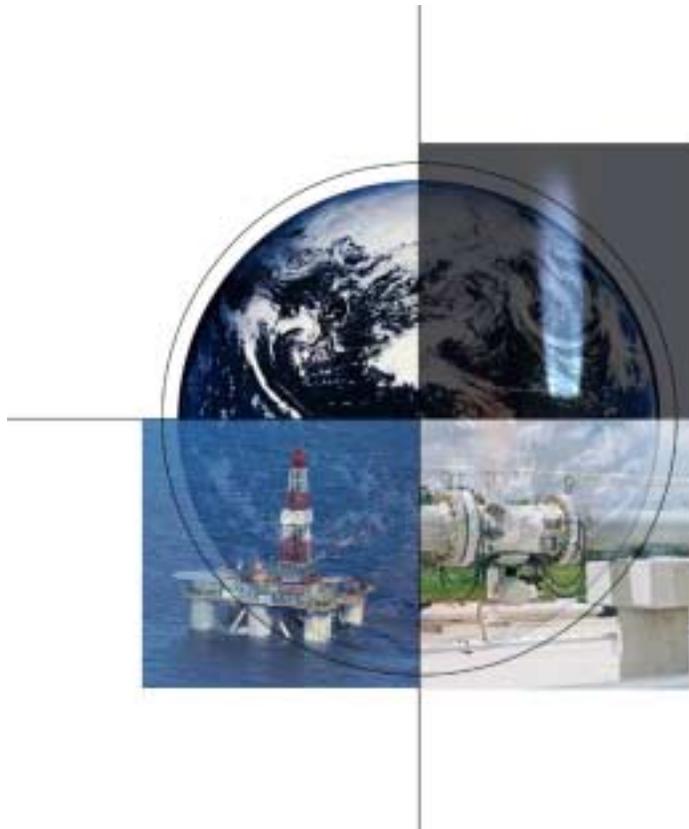


# Natural Gas Infrastructure Reliability



*Industry Forums  
September, 2002*

*Dr. Dan Driscoll  
Project Manager*

*Strategic Center for Natural Gas*



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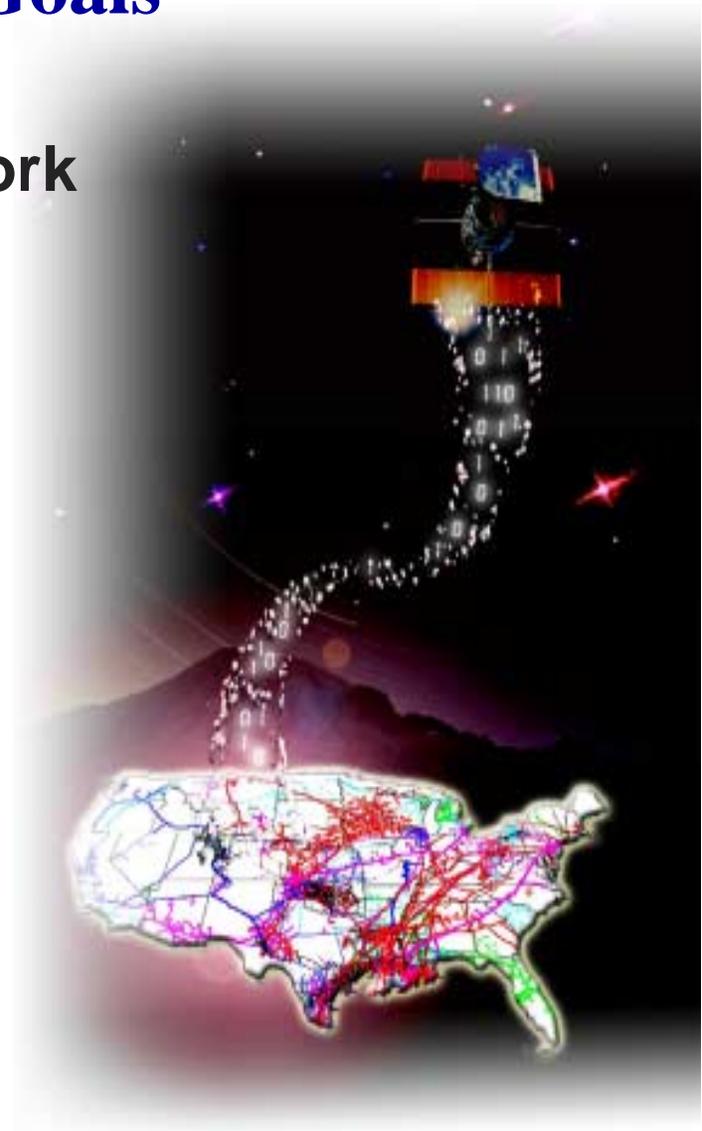
## **Program Objectives**

**The objective of the Natural Gas Infrastructure Reliability Program is to encourage, promote and support research and development efforts that result in the development of technology or methodology that will maintain or enhance the integrity, operational reliability and security of the Nation's transmission and distribution pipeline network.**



# Infrastructure Goals

- **Establish the technology framework for our Nation's future secure natural gas transportation and delivery system**
  - Provide research and technology development
  - Focus federal infrastructure program on public benefit R&D
  - Collaborate with private sector
  - Support infrastructure assurance



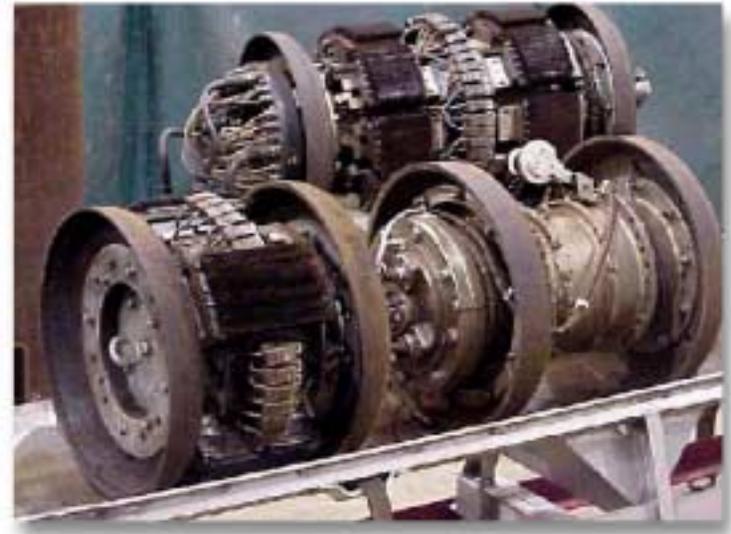
# Implementation Strategy

- Focus on high risk, innovation, and leap frog technologies
- **Balanced R&D program**
  - Distribution, transmission, & crosscuts
- **Most funding dedicated to private sector projects**
- **National laboratory efforts focused on innovation**
- **Industry participation**
- **Collaborations & cost sharing**
- **Some quick wins to demonstrate progress**



# Collaborations

- **Gas Industry**
  - All
    - Project participation, proposal and project review
- **Natural Gas Organizations**
  - AGA, APGA, NYGAS, INGAA, GMRC, PRCI, etc
    - Stakeholder input, communication channel for products, cost share
- **R&D Organizations**
  - GTI, Battelle, SwRI, National Labs, universities, etc
    - Project participation, innovation, technical issues
- **Federal**
  - DOT/OPS
    - Share experience, cost share, joint strategy



# Natural Gas Industry Background

- 270,000 miles of transmission pipelines\*
- 952,000 miles of distribution pipelines\*
- \$8 billion/yr investment in new infrastructure\*
- Energy companies dominating the industry
- R&D viewed as expense, not investment
- FERC-funded R&D loss
- Growing DOE role in infrastructure R&D
- Security difficult with dispersed assets

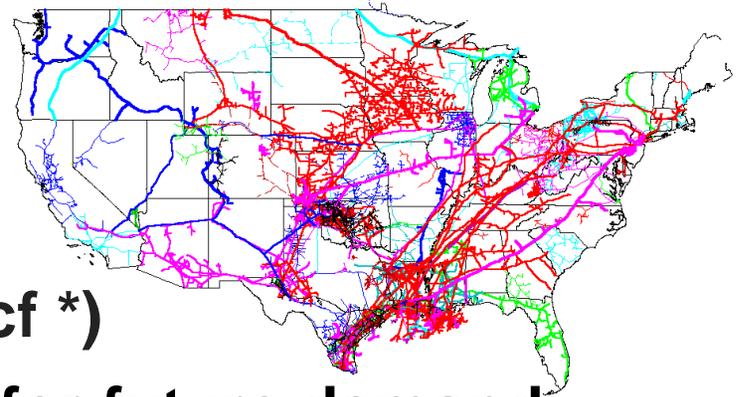


*\*NPC Report, December 1999*



# Infrastructure Drivers

- Gas demand increase by 50% (to 34 tcf) by 2020 \*
- Electric generators demand for gas to almost triple (grow by 6 tcf \*)
- Aging infrastructure inadequate for future demand
- Consolidation and competition limits gas industry investment in long-term public benefit R&D
- Distributed power drive infrastructure changes
- Gas *critical* for U.S. climate change strategies
- Increasing environmental sensitivities
- Heightened security concerns



\*Annual Energy Outlook 2002

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## Program History

- **Mid FY00 - Program Initiated - No funding, No Projects**
- **October FY01 (2000) - Initial Funding (\$4,950K)**
- **September FY01 (2001)- 31 Projects (\$17,000,000)**
- **October FY02 (2001) - \$7,500K**
- **January FY02 - Technology Status Assessments**
- **March FY02 - Second Solicitation - 6 selections**
- **Continuing FY02 - Broad Based Solicitation - 4 selections**
- **October FY03 - 41 projects (>\$20,000,000)**



# FY02 Infrastructure Activities

## Goals

- ☐ Elicit stakeholder input
  - Portfolio gaps
  - Innovation
  - Infrastructure security
- ☐ Determine government role

**Roadmap Update Workshop**  
January 29 & 30, Pittsburgh, PA  
40 industry experts

## National Labs

July Lab Call  
Focus on innovation

## Competitive Solicitation

Selections Announced  
Six awards expected  
Various stages of development

## Broad-Based Financial Assistance

Selections Announced  
Four awards expected  
Various stages of development



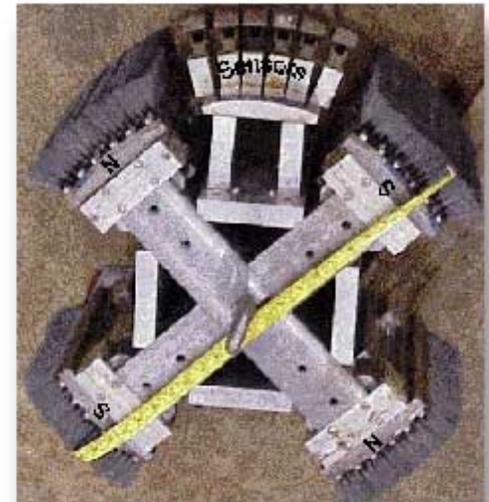
# Roadmap Update Workshop Summary

- **Re-affirmed major priorities of Roadmap**
  - Inspection tools for integrity and reliability
  - 3<sup>rd</sup> Party Damage
  - ROW intrusions
  - Environmental issues
- **Identified importance of infrastructure security**
  - Personnel intrusion monitoring
  - Secure SCADA systems
  - National emergency monitoring system
  - Vulnerability assessments
- **Emphasized need for industry/gov't collaborations**
- **Focused on near-term R&D (50-30-20)**



## FY03 Planned Activities

- **Update Natural Gas Infrastructure Roadmap**
- **New contract awards (BBFA and targeted solicitation)**
  - Portfolio gaps, innovation, and security
- **Continue industry forum group meetings**
  - Provide industry feedback on active projects
- **National Lab Call**
- **Explore security demonstration**
- **Evaluate university consortium**
- **Build collaboration with DOT/OPS**



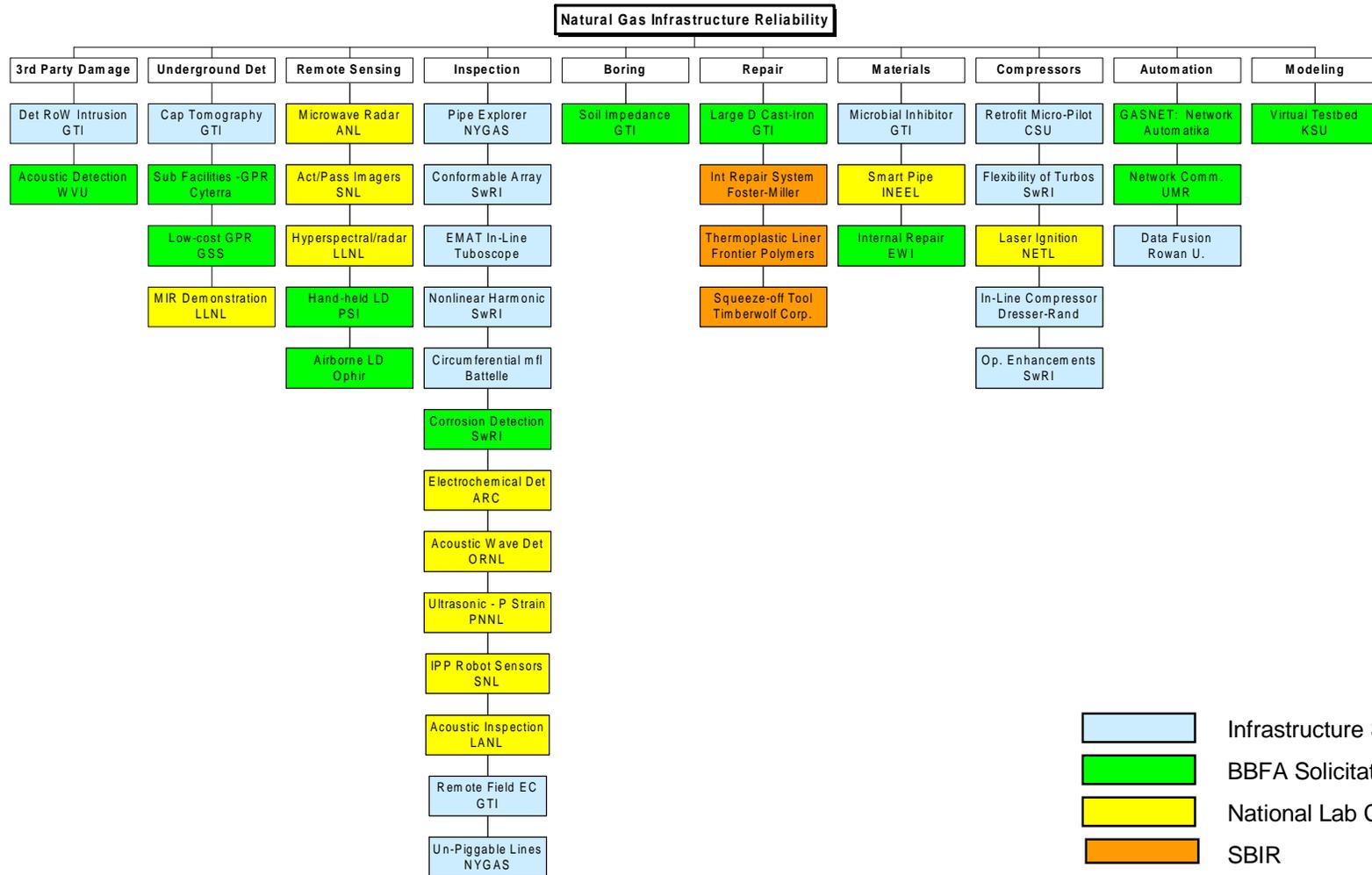
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# Program Portfolio

- **Currently - 41 ongoing projects in 4 key areas**
  - Inspection Technologies
  - Remote Sensing
  - Materials Development
  - Operational Technologies



# Project Portfolio

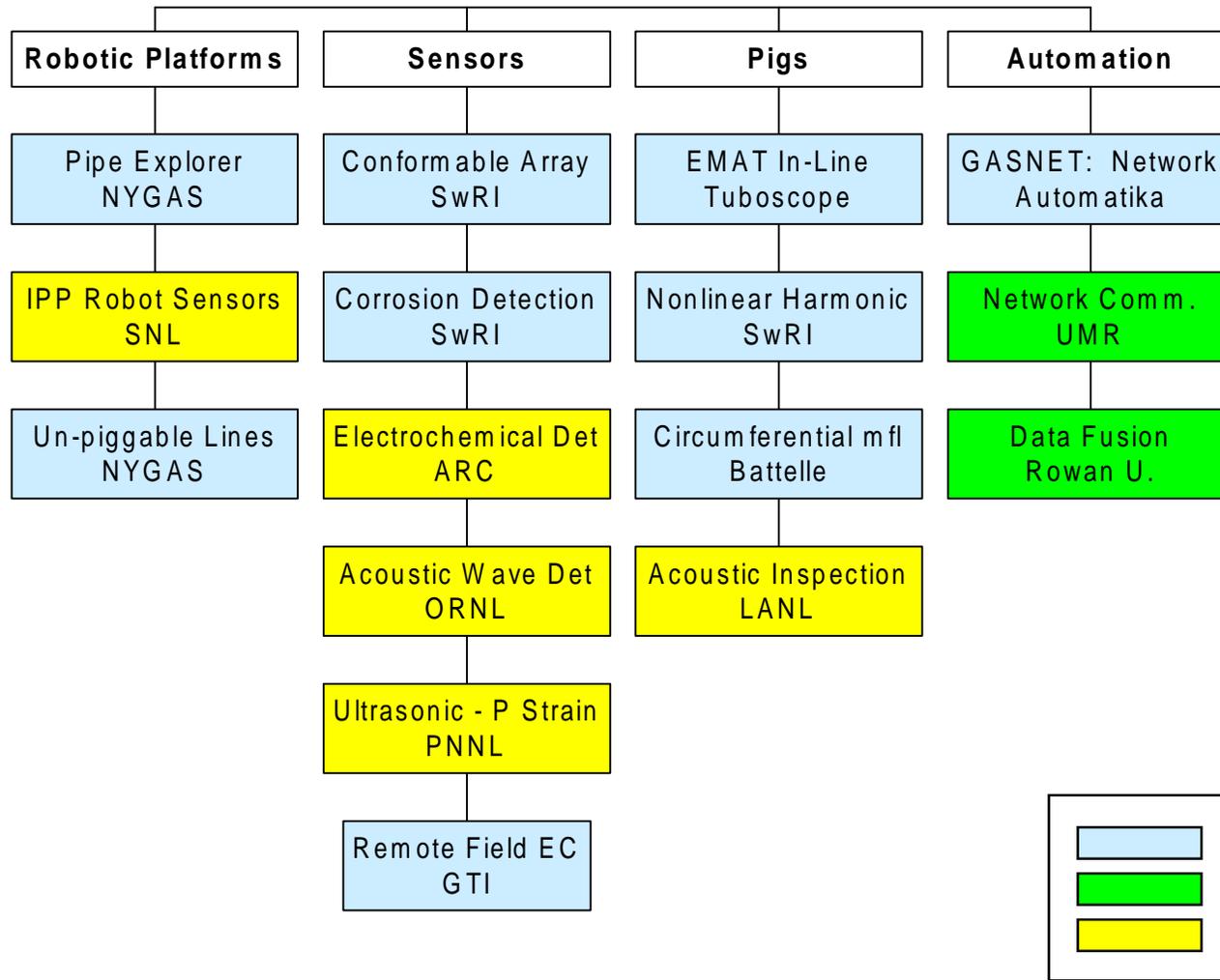


## Core Areas & Issues

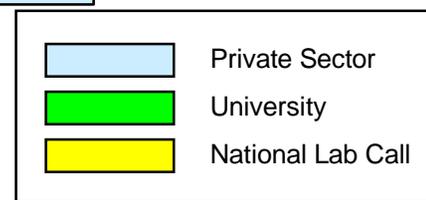
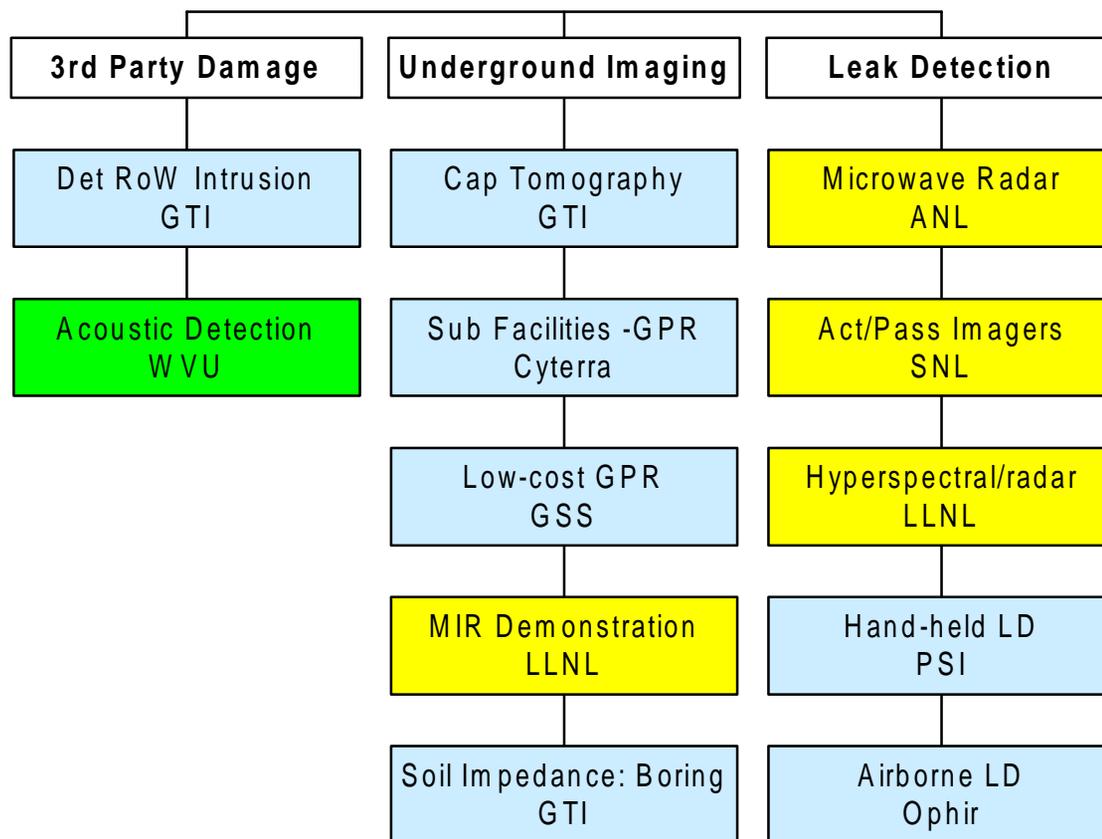
- **Pipelines and distribution systems**
  - Third-party damage
  - Integrity Assessment
  - Leak detection – Remote Sensing
  - Guided boring technology
  - Underground facility location
  - Compressor technology
  - Aging pipeline and distribution systems
  - Growth of distributed power
  - Internal pipe inspection/repair
  - System automation and control
- **Environmental**
  - Environmental impact
  - Federal permitting process



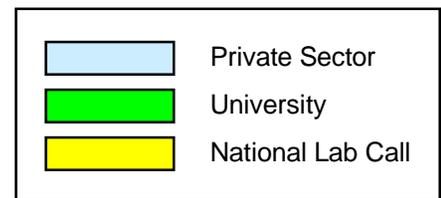
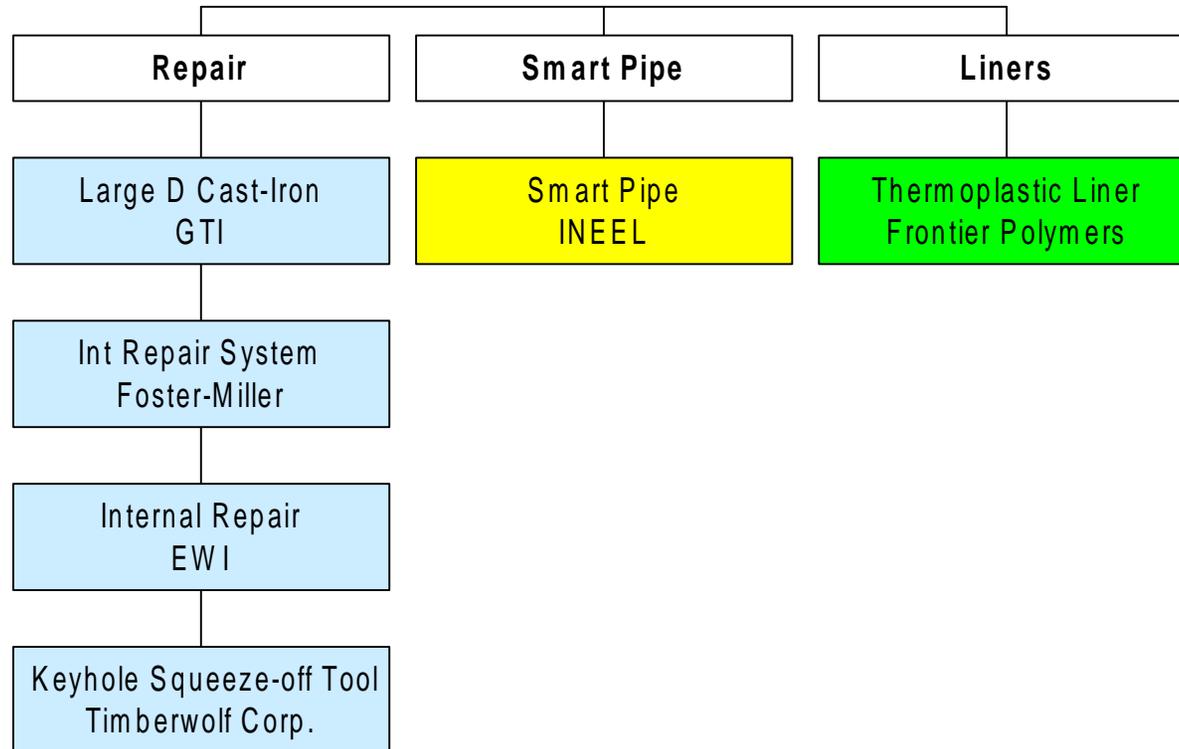
# Inspection Technologies



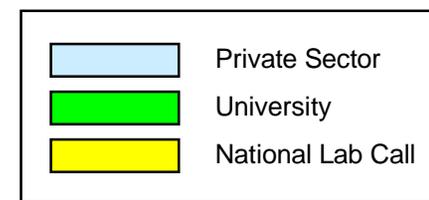
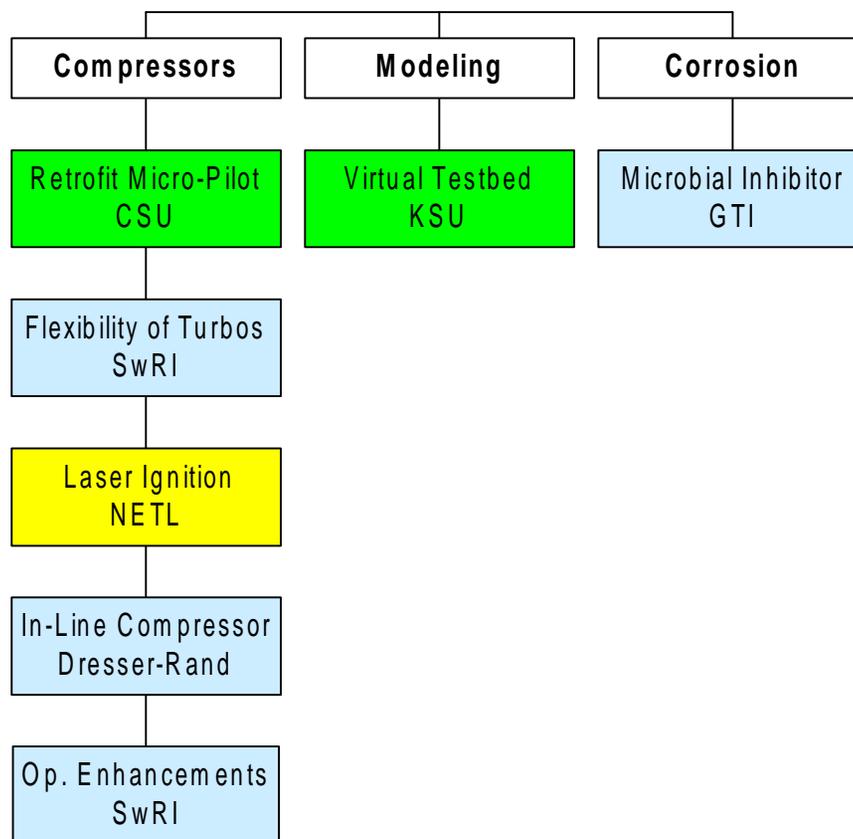
# Remote Sensing



# Materials Development



# Operational Technologies



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## Industry Forums

- **Provides the first opportunity to highlight all of the infrastructure projects at one time**
- **Provides an opportunity to obtain input from pipeline operators and technical experts regarding:**
  - How the overall portfolio addresses industry issues and are there gaps in the program
  - How the individual projects support the industry and the goals of the infrastructure program
  - The potential for commercialization and use of the technologies by the pipeline industry



# Solicitation Information

## DE-PS26-02NT41613

**“Development of Technologies and Capabilities for Developing Coal, Oil and Gas Energy Resources”**

(Proposals due October 28, 2002)



**Available on the NETL Website at:**

<http://www.netl.doe.gov/business/solicit>

**Or**

<http://e-center.doe.gov>



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
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April 18, 2002

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 for Natural Gas*

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