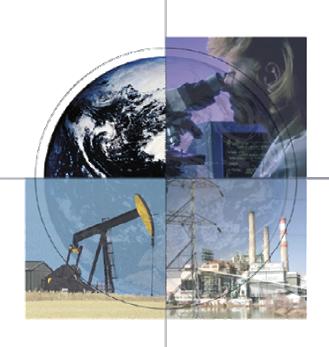
U.S. DOE Sequestration Program

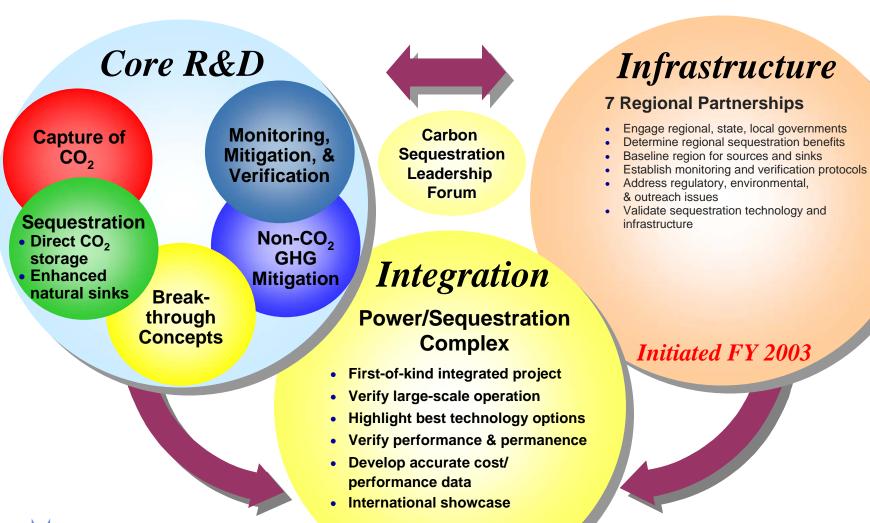


CSLF Meeting

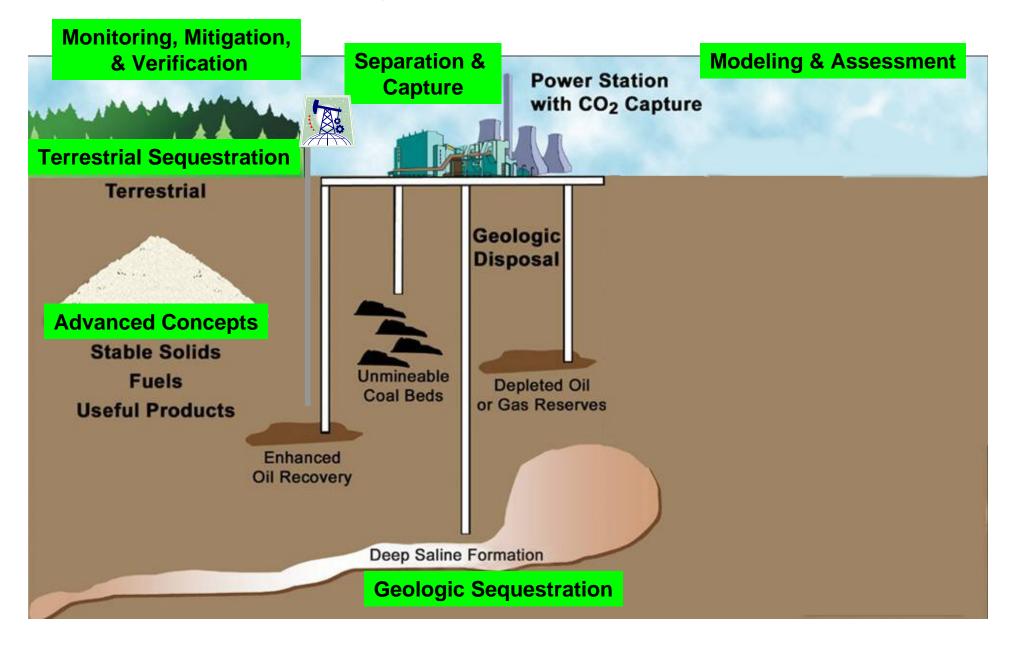
September 2005



Carbon Sequestration Program Structure

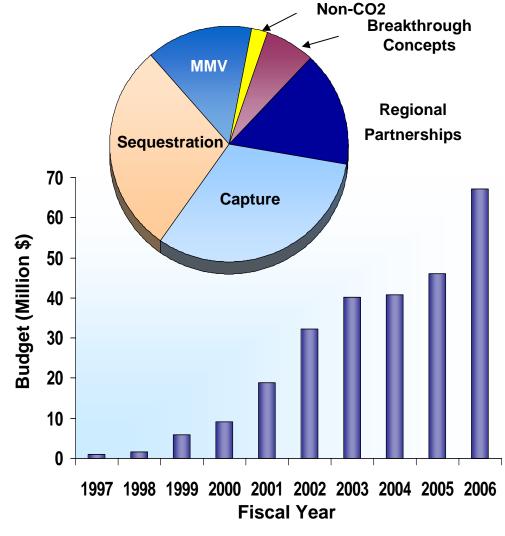


Key Research Areas



Sequestration: A Dynamic Program Portfolio Overview – FY2005

- Diverse research portfolio
 - ~ 60 R&D Projects
 - IEA & CCP consortia
- Strong industry support
 - ~ 36% cost share
- Federal Investment to Date
 \$200 Mil
- Administration Priority
 - ~ 50% increase in 2006 budget request
 - House \$50 MM
 - Senate \$74.2MM





Separation & Capture R&D

Technology Goals

- 2007 have two technologies < 20% increase in Cost of Energy
- 2012 developed two technologies < 10% increase Cost of Energy

Issue

- Demonstrated technology is costly
- Scale-up (Lab scale to Commercial Plant)

Pathways

- Pre-combustion capture
- Post-combustion capture
- Oxygen-fired combustion
 - Chemical looping
 - Optimized engineering



Sequestration/Storage R&D

Technology Goals

- 2012 predict CO2 storage capacity with +/- 30% accuracy
- Develop best practice reservoir management strategies that maximize CO₂ trapping

Issues

- Health, safety, and environmental risks
- Uncertain regulatory framework
- Site selection

Pathways

- Field experiments / demos
- Protocols for identifying amenable storage sites
- Capacity evaluation studies





Monitoring, Mitigation & Verification

Technology Goals

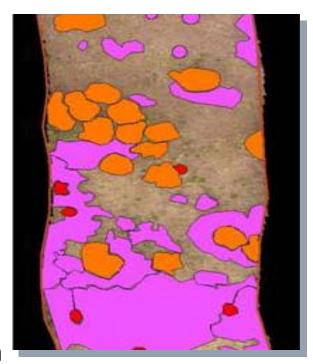
- 2012 ability to verify 95% of stored CO₂ for credits (1605b)
- CO2 material balance to >99%

Issue

Proving CO₂ fate

Pathways

- Surface and subsurface CO₂ leak detection and mitigation tools
- Atmospheric detection systems
- CO₂ fate and transport studies
- Protocols for accounting and permanence



Digital Aerial Imagery to Estimate Carbon Stocks in Above-Ground Vegetation

Carbon Sequestration Program Structure

Core R&D

Capture of CO₂

Sequestration

- Direct CO₂ storage
- Enhanced natural sinks

Breakthrough Concepts

Monitoring, Mitigation, & Verification

> Non-CO₂ GHG Mitigation

Carbon
Sequestration
Leadership
Forum

Infrastructure

7 Regional Partnerships

- Engage regional, state, local governments
- Determine regional sequestration benefits
- Baseline region for sources and sinks
- Establish monitoring and verification protocols
- Address regulatory, environmental,
 & outreach issues
- Validate sequestration technology and infrastructure

Integration

Power/Sequestration Complex

- First-of-kind integrated project
- Verify large-scale operation
- Highlight best technology options
- Verify performance & permanence
- Develop accurate cost/ performance data

Initiated FY 2004

Initiated FY 2003



Regional Carbon Sequestration Partnerships

Developing Infrastructure for Wide Scale Deployment

- Seven (7) Regional Partnerships
 - Big Sky Regional Carbon Sequestration Partnership
 - West Coast Regional Carbon Sequestration Partnership
 - Midwest Regional Carbon Sequestration Partnership (MRCSP)
 - Southeast Regional Carbon Sequestration Partnership (SECARB)
 - Southwest Regional Partnership on Carbon Sequestration
 - Illinois Basin Regional Partnership
 - Plains CO2 Reduction Partnership
- Validating sequestration technology
 & infrastructure
 - Phase 1 design
 - Phase 2 testing

Announcement of Phase II Selections

By moving carbon sequestration technology from the laboratory to the field...we are another step closer to significantly reducing greenhouse gas emissions while maintaining the important role coal plays in America's energy mix.

Samuel W. Bodman Secretary of Energy June 9, 2005



Regional Carbon Sequestration Partnerships Field Validation Tests

