



NATIONAL ENERGY TECHNOLOGY LABORATORY



FutureGen 2.0

Jeff Hoffmann

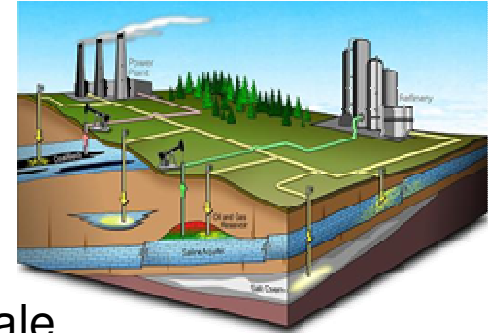
U.S. Department of Energy, Office of Major Demonstrations

National Environmental Policy Act Public Scoping Meetings

June 7-9, 2011



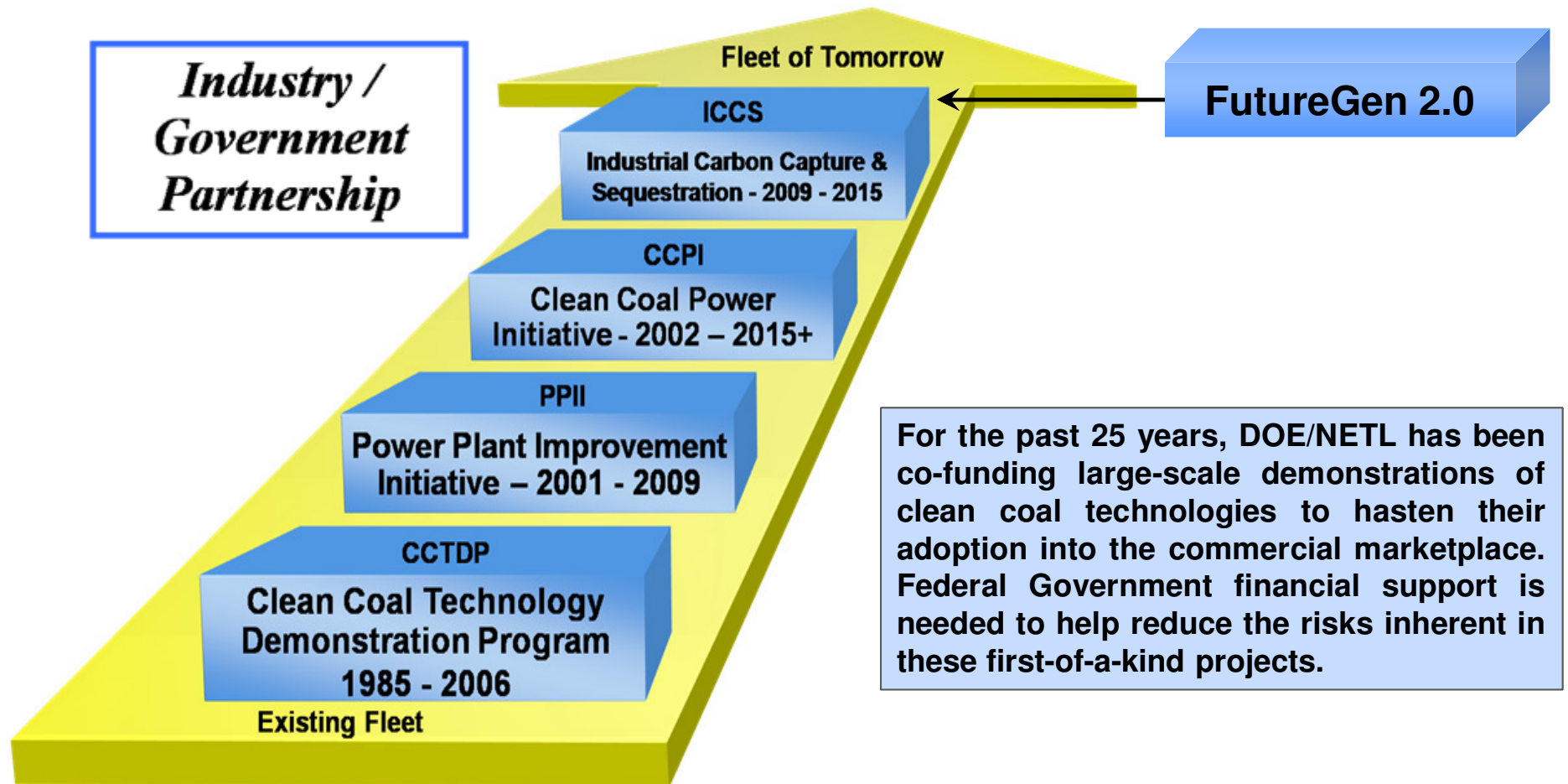
What is FutureGen 2.0?



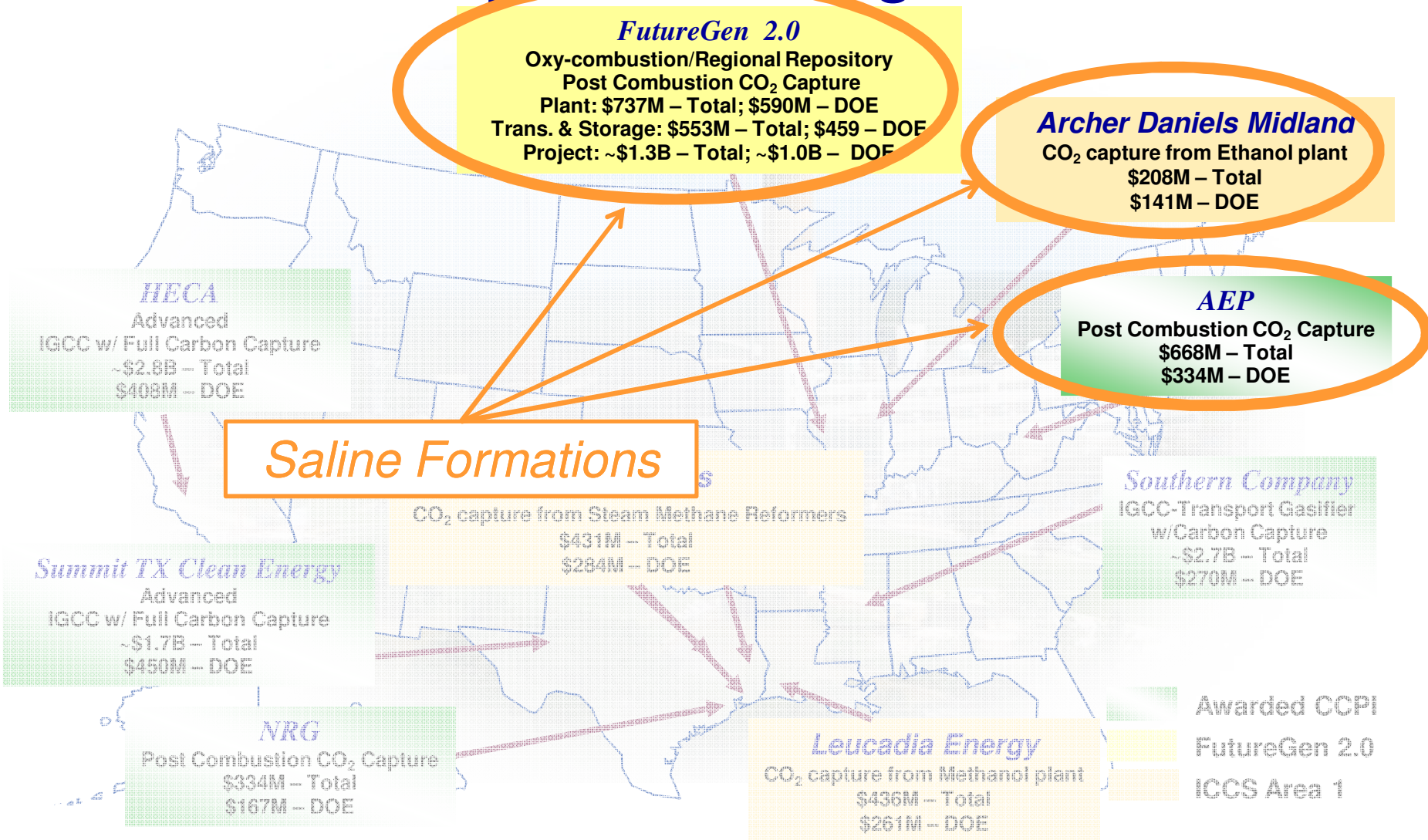
- **U.S. DOE has awarded \$1.05 Billion:**
 - \$590 million to Ameren, Babcock & Wilcox and American Air Liquide to test oxy-combustion technology at utility-scale
 - \$459 million to FutureGen Alliance to transport and geologically store the CO₂
 - Approximately \$1.3B total project value including private cost share
- **FutureGen 2.0 project objectives are to:**
 - Validate the technical feasibility and economic viability of near-zero emission energy from coal
 - Verify effectiveness, safety, and permanence of CO₂ sequestration in a saline formation
 - Establish standardized technologies and protocols for CO₂ measurement, verification, and accounting (MVA)
 - Gain domestic and global acceptance of the FG2.0 concept & facilitate broad deployment of oxy-combustion coupled with CCS

DOE's Major Demonstrations Program

A History of Innovative Projects



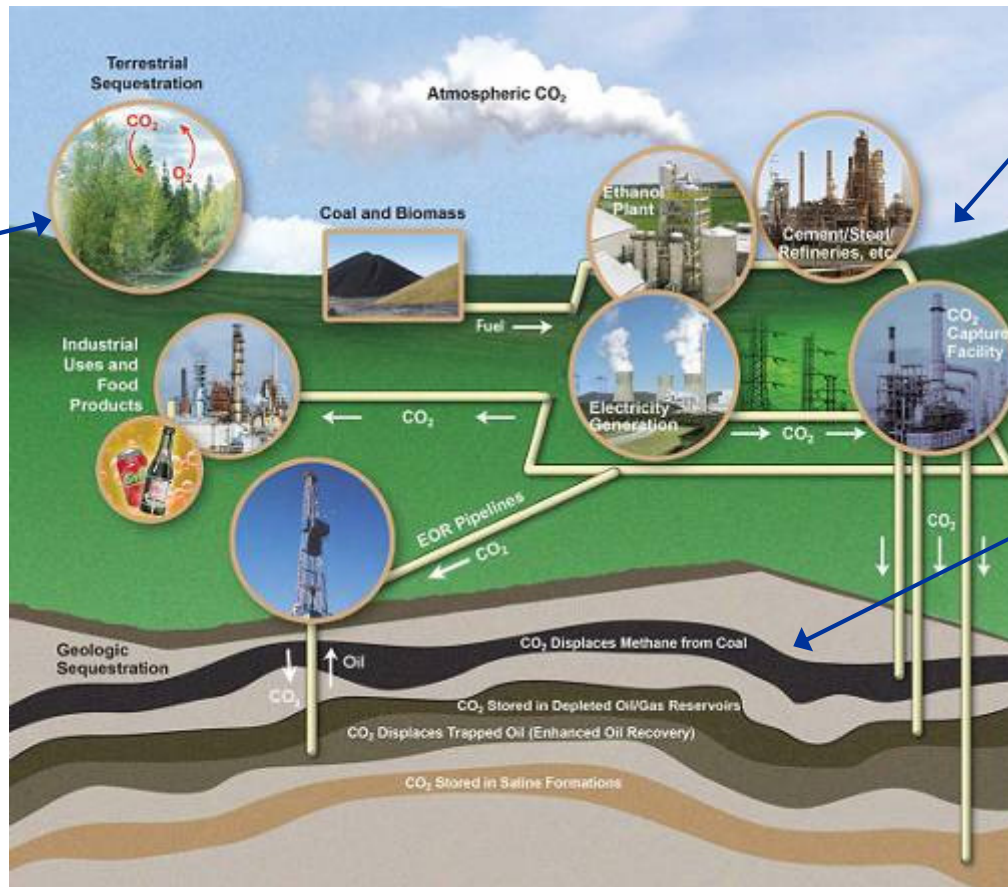
Carbon Capture and Sequestration (CCS) Projects and Progress



What Is Carbon Sequestration?

Capture and storage of CO₂ and other greenhouse gases that would otherwise be emitted to the atmosphere

Terrestrial Capture
(CO₂ absorbed from air) and Storage
(Trees, grasses, soils)



Point Source Capture

*Power plants
Ethanol plants
Cement, steel, refineries
Natural gas processing*

Geologic Storage

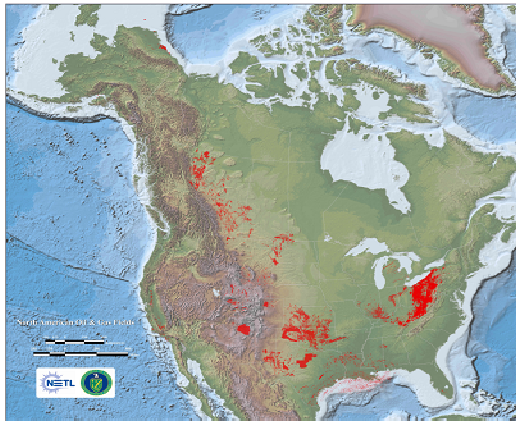
*Saline formations
Depleted oil / gas wells
Unmineable coal seams
Basalts, shales, other*

Sufficient Storage Capacity Emerging

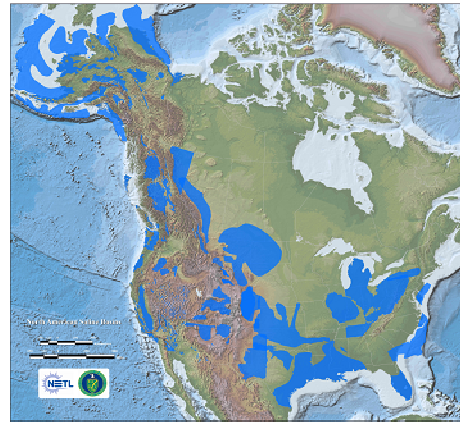
National Atlas Highlights

U.S. Emissions ~ 5.6 Billion Tons CO₂/yr all sources

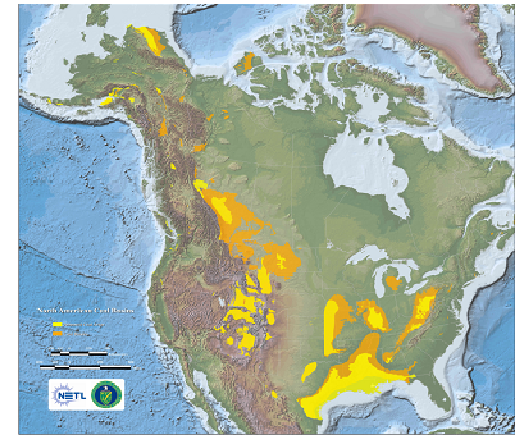
U.S. Emissions from the Coal-Fired Electricity Sector ~1.9 Billion Tons CO₂/yr



Oil and Gas Fields



Saline Formations



Unmineable Coal Seams

*North American CO₂ Storage Potential
(Billion Metric Tons)*

Sink Type	Low	High
Saline Formations	1,653	20,213
Oil and Gas Fields	143	143
Unmineable Coal Seams	60	117

Available for download at http://www.netl.doe.gov/publications/carbon_seq/refshelf.html

FutureGen Program

- **March 2004 Report to Congress**
Integrated research initiative, objective to establish feasibility and viability of producing electricity from coal with near-zero emissions
- **December 2007**
FutureGen Alliance selects Mattoon, IL as location for IGCC w/ CCS
- **August 2010**
FutureGen 2.0 announced as an alternative approach to achieve near-zero emission electric power from coal

