

U.S. Department of Energy Clean Coal RD&D Portfolio

Carbon Storage Program Annual Meeting
August 18, 2015

Mark Ackiewicz

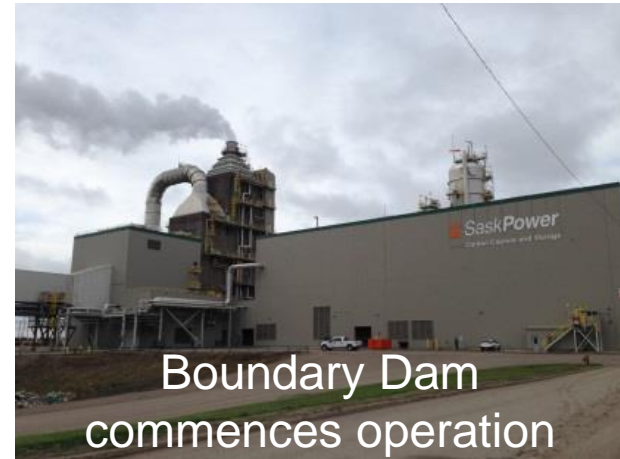
Director, Division of CCS R&D

U.S. Department of Energy, Office of Clean Coal and
Carbon Management

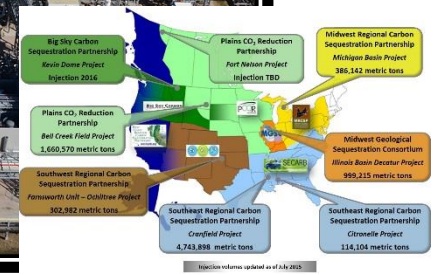
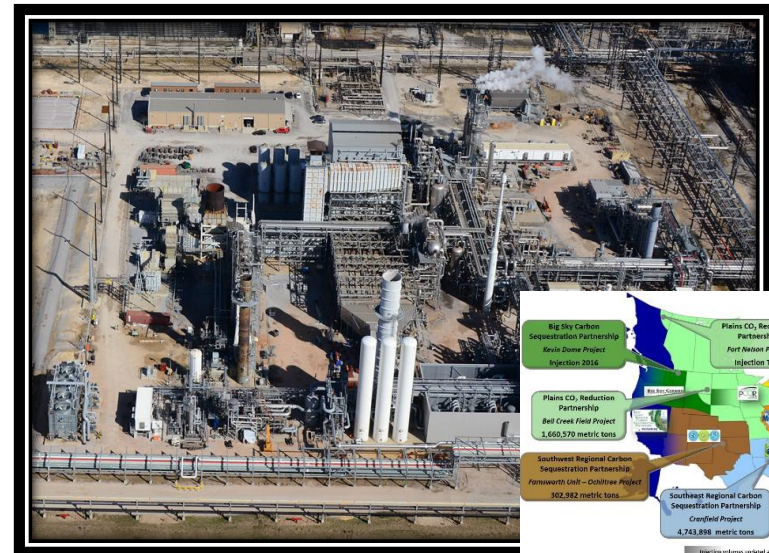
A year of significant CCS progress



“It is critical that national and international policies on CCS and Capture Utilization and Storage (CCUS) activities have parity with other no carbon/low carbon technologies regarding their climate mitigation potential.”

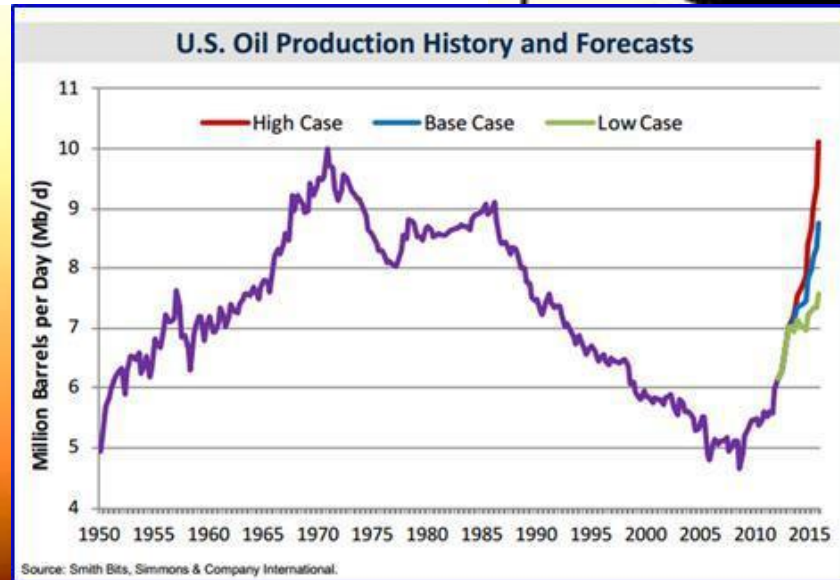
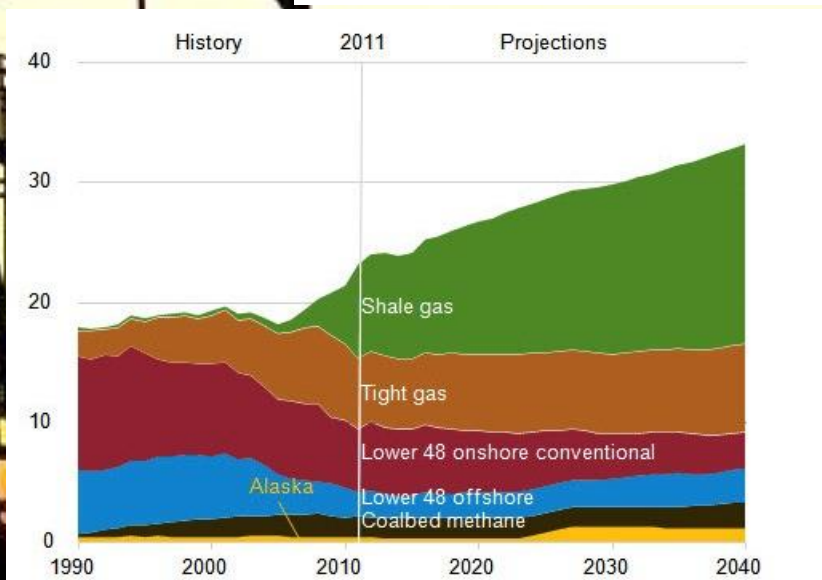
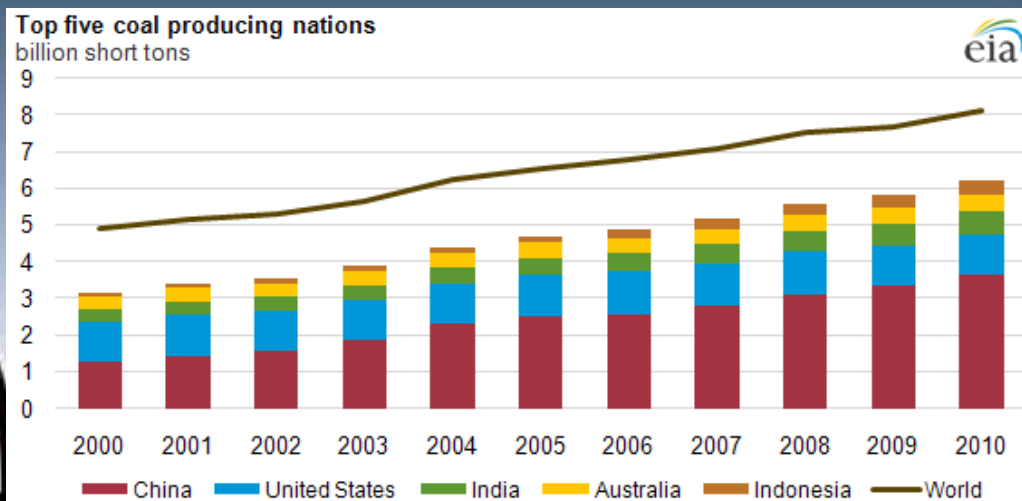


Petra Nova Breaks Ground



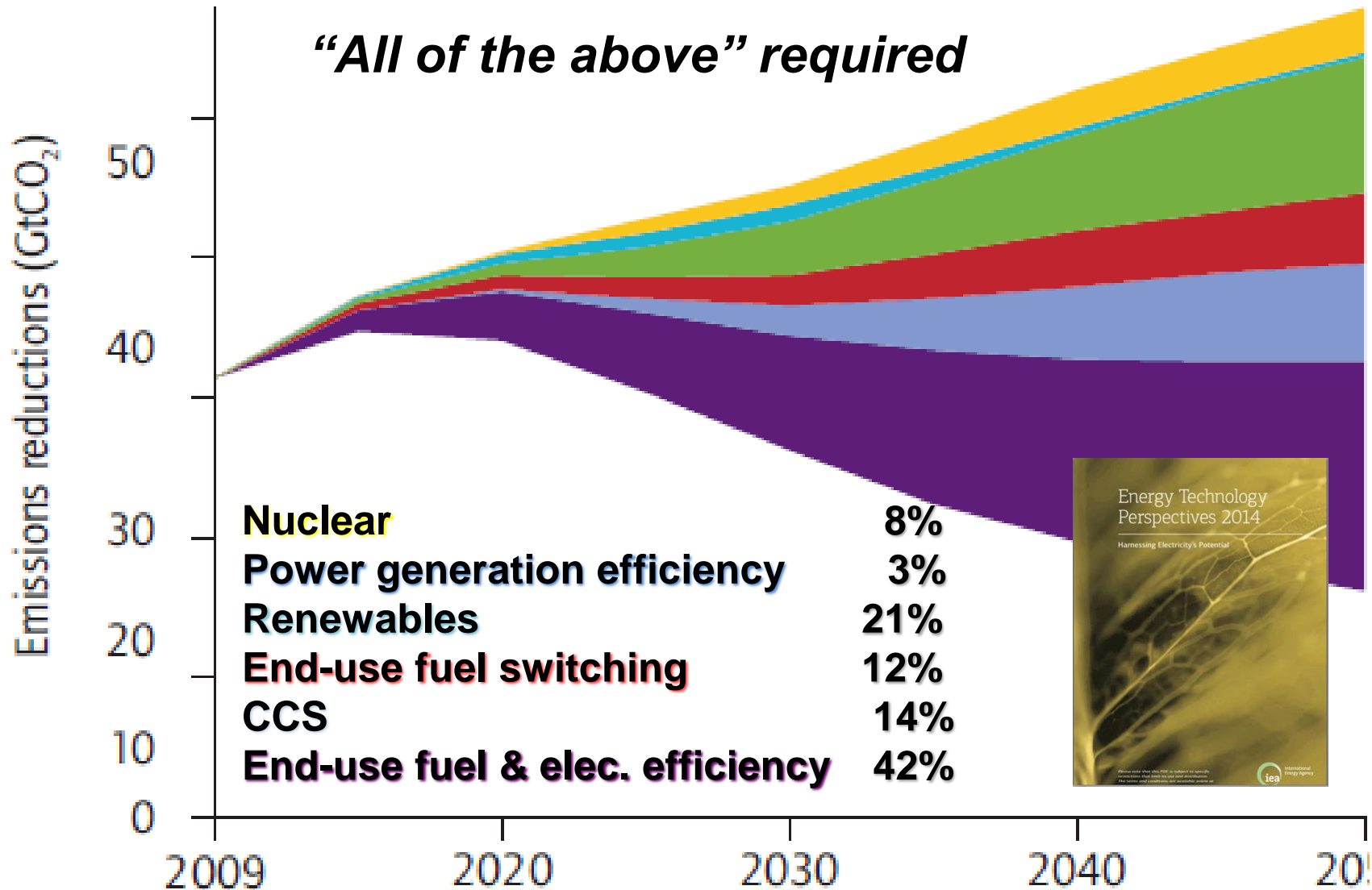
10 million tonnes through DOE projects

This is a time of fossil energy abundance

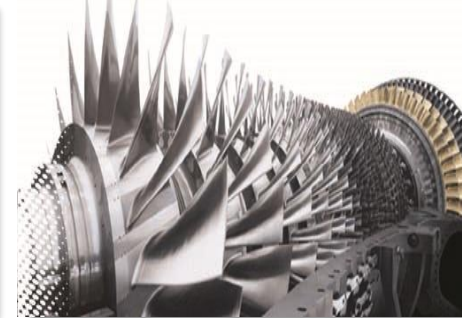
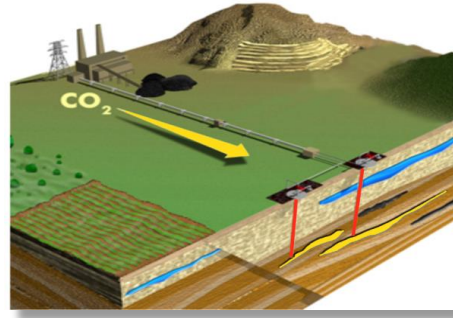


CCS technology remains critically important

abundant, low-cost fossil energy is why



A technology pipeline for affordable CCS



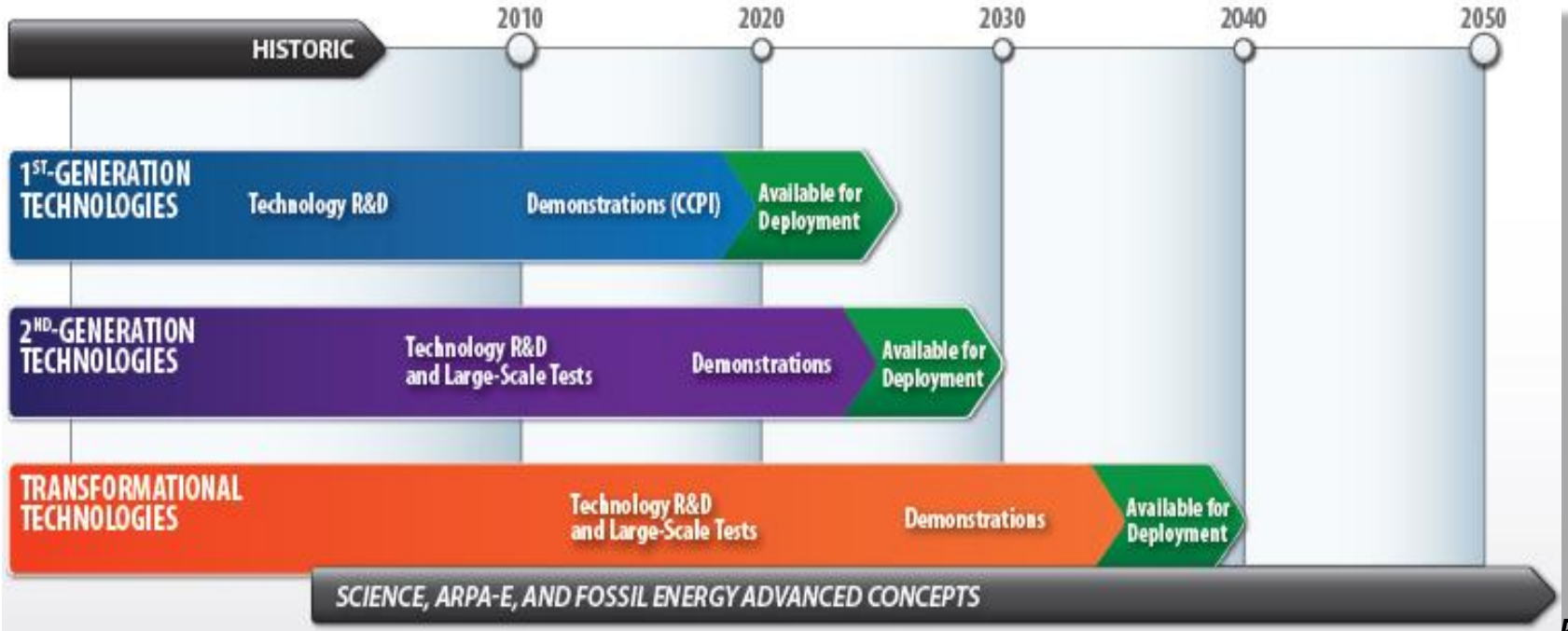
CO₂ Capture CO₂ Storage Advanced Energy Systems Crosscutting Research

Cost-effective capture for new and existing plants

Safe, permanent storage of CO₂ from power and industry

Gasification, advanced turbines, advanced combustion, and fuel cells

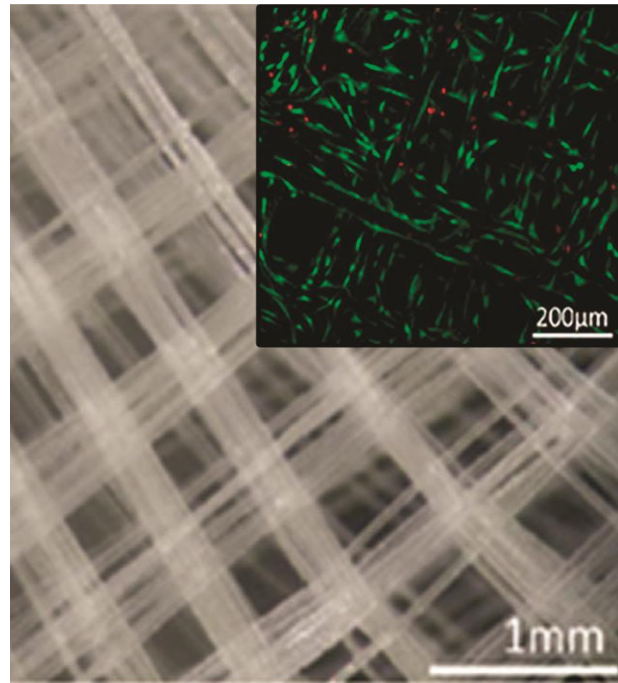
Crosscutting technology development



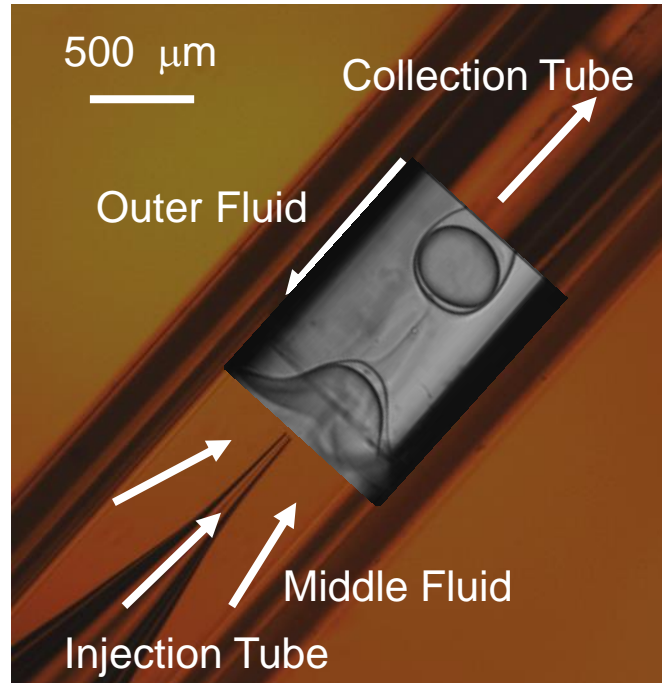
Transformational Technologies

Advanced simulation and manufacturing brings new materials into being and new utility

Additive manufacturing



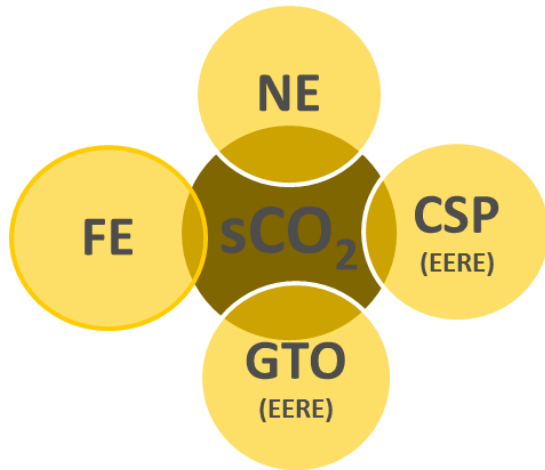
Microfluidics



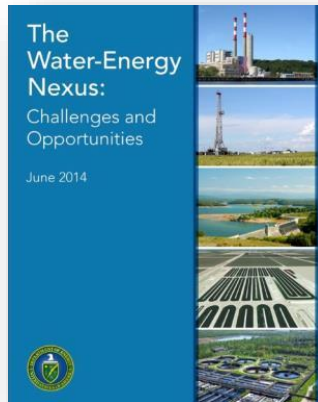
Advanced Roll to Roll



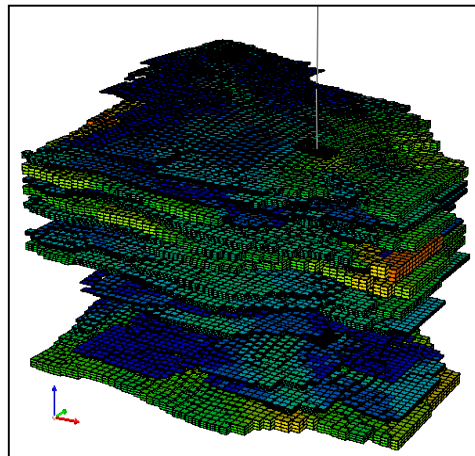
Departmental Crosscutting/Tech Team Initiatives



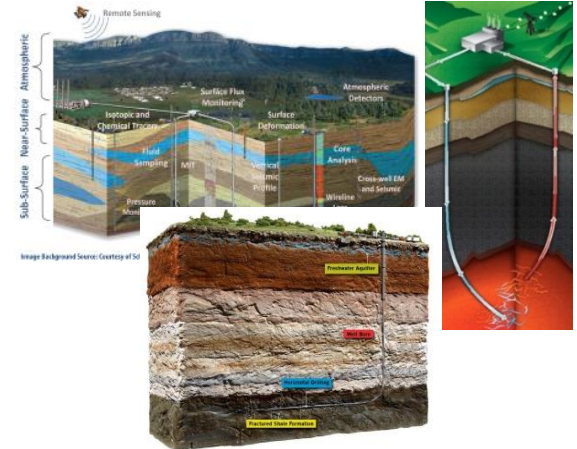
Supercritical CO₂ Power Cycles



Water-Energy



Advanced/Exascale Computing



Subsurface Technology and Engineering R&D



Grid Modernization



Global challenge → global progress

new global solutions still required

Quest (CAN)

White Rose
Peterhead
(UK)

GreenGen (PRC)
Shenli
Yanchang

Boundary Dam
(CAN)

Uthmaniyah (KSA)

- Pure CO₂ Sources >95%
(kT CO₂ per year)
- 0 - 250
 - 250 - 500
 - ◻ 500 - 1000

Lula (BRA)

ESI (UAE)

Gorgon (AUS)

We need more projects and more information



Key Priorities

- **Deliver large CCS projects to maximum scientific and technical benefit**
- **Support a diverse clean coal research program likely to bring to market large improvements in cost, efficiency, and performance**
- **Find solutions to maximize carbon efficiency and offset costs of CCS**