Third Annual Wyoming CO$_2$ Conference

Utilizing the LaBarge experience to support the global development of CCS

Michael Parker, P.E.
Technical Advisor
Safety, Health and Environment
ExxonMobil Production Company
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CCS – a promising option
challenges in commercializing CCS

- large scale demonstration of integrated component technologies
- technology improvements to reduce capital cost and energy intensity
- sound legal and regulatory framework
  - stable economic basis
  - property rights/access
  - long term site responsibility
- recognition of scale
  - rivals existing oil and gas production infrastructure.
- LaBarge experience illustrates the challenges, opportunities, and progress
LaBarge operations

• history
  – First well tested by Mobil          1963
  – First well tested by Exxon (Humble) 1969
  – Delineation wells drilled by Exxon   1981
  – Plant site construction began       1984
  – First production                    1986

• LaBarge project unique features
  – Lowest hydrocarbon gas commercially produced in industry
  – First and largest CO$_2$ sales system in the Rockies
  – Largest gas sweetening plant in the world
  – Largest helium recovery plant in the world (25-30% of world supply)
  – Largest longest sour gas pipeline in the world
  – Largest sour gas injection facility in the world
CO₂ management at LaBarge

• CO₂ sales for EOR began with plant start-up in 1986
  – current capacity 230 Mcfd
  – post expansion capacity 340 Mcfd (mid 2010)

• CO₂ Injection with sour gas 25 Mcfd

• vast majority of CO₂ sales utilized for EOR
  – demonstrates IEA “early opportunity” model for CCS – Capture and EOR
    – current sales capacity ~ 5 Mt/yr (equivalent to 1.1 M vehicles)
    – post expansion sales ~ 7 Mt/yr (equivalent to 1.6 M vehicles)

• Co-gen facility reduces CO₂ emissions by ± 50 % compared to purchased power
  – ExxonMobil patented low BTU combustion technology

• Controlled Freeze Zone™ commercial demonstration
experience with CCS technologies

Shute Creek, Wyoming

Shute Creek Gas Plant

Gas Composition
65% Carbon dioxide
22% Methane
7.4% Nitrogen
0.6% Helium

LNG 5 MCFD
Black Canyon Processing Facility

CO₂ Compression

CO₂ Metering

Wellfield

Black Canyon Processing Facility

H₂O

Shute Creek Gas-Treating Facility

LPG 5 MCFD
Methane 115 MCFD
Helium 4 MCFD
CO₂ 230 MCFD

ExxonMobil

Taking on the world’s toughest energy challenges.
Controlled Freeze Zone (CFZ™) separation

- Controlled Freeze Zone (CFZ™) – single step process for separation of CO₂
  - ExxonMobil developed technology, patented in 1986
  - commercial scale, $100M demonstration under construction at LaBarge, WY, 2010 start-up
  - lower cost process that may make CCS a more practical option for CO₂ from natural gas
research and development partnerships

• sponsored research
  – CO$_2$ReMoVe, GCEP, Georgia Tech, IEA GHG, MIT CSI, University of Texas

• program support
  – USDOE Regional Program Partner, Southeast and Southwest programs
  – University of Wyoming data sharing and research collaboration

• founding member of the “Global CCS Institute”
University of Wyoming collaboration

• **project motivation**
  – long term viability of WY energy resources
  – utilization of potential WY CO₂ storage resources

• **study scope**
  – geologic characterization
  – laboratory experiments
  – geologic modeling
  – preliminary capacity assessments

• **ExxonMobil support**
  – E&P experience supports project goals
    – knowledge/experience sharing
    – work “already done”
  – sharing opportunities
    – geologic/geophysical data bases and integration with models (PETREL)
    – geochemical data and interpretation
    – samples – cores and produced fluids
    – access to facilities and operations
CCS – a promising option

- CCS - a potentially powerful tool to address risks posed by rising GHG emissions
- widespread deployment entails a sound legal and regulatory framework
- long term, CCS must compete economically with other GHG mitigation technologies
- oil and gas industry, ExxonMobil in particular, can provide relevant support and expertise
- collaborative effort needed to reach our mutual goal of reduced emission

Adapted from Summary for Policy Makers, IPCC Special Report on CO2 Capture and Storage, 2005
Questions?