



**Task Force Update on Bioenergy with Carbon  
Capture and Storage**

**John Litynski / Mark Ackiewicz**  
**Technical Group Meeting**  
**Tokyo, Japan**  
**October 2016**



## Background

- **June 2015 Regina CSLF Meeting:** Technical Group formed ad hoc group to investigate and suggest new areas/opportunities for technical action plan.
- **November 2015 Riyadh CSLF Meeting:**
  - Ad hoc team presented findings and suggestions
  - Three new task forces formed, including BECCS
  - Members/interest: USA (chair), IEAGHG, Italy, Norway
- **June 2016 London CSLF Meeting:**
  - Task Force update
  - UK interested in assisting



## Tentative Timeline of the Task Force

- ✓ November 2015: Topic area proposed and seek members/interest.
- ✓ June 2016: Status update.
- ✓ July 2016: Membership Established/Finalized.
- ✓ **August 2016: Define report.**
- ✓ **October 2016: Status update at Japan CSLF meeting.**
- ✓ **Spring 2017: First draft of report completed. Circulated to Task Force Members for comments and edits.**
- ✓ **Spring/Summer 2017: Task Force Comments due.**
- ✓ **Fall 2017: Final Report submitted.**



## Prior and Ongoing BECCS Efforts (Not comprehensive)

- IEA 2011 Report – Combining Bioenergy with CCS
- IEAGHG July 2014 Report – Biomass and CCS – Guidance for Accounting for Negative Emissions
- IEA Bioenergy Task 41: Series of Four Workshops on Bio-CCUS.
  - First workshop – May 10, 2016 in Oslo:
    - update on status of national plans and roadmaps of Bio-CCUS
    - Identify possible and potential business cases
- Projects (not comprehensive)
  - Norway: Klemetsrud waste-to-energy plant near Oslo
  - USA: ADM Decatur ethanol facility with saline storage
  - USA: Two ethanol facilities have/are supplying CO<sub>2</sub> for EOR

# Carbon Sequestration Leadership Forum

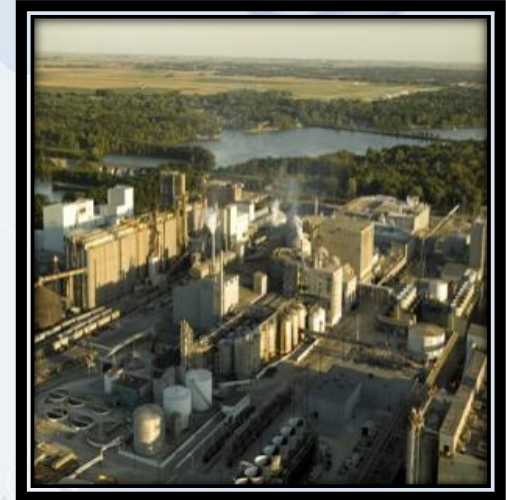
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## Archer Daniels Midland Company ICCS Project

### *CO<sub>2</sub> Capture from a Biofuel Plant*

- Decatur, IL
- CO<sub>2</sub> (>99% purity) is a by-product from production of fuel-grade ethanol via anaerobic fermentation
- Up to 90% CO<sub>2</sub> capture, dehydration (via tri-ethylene glycol) & compression
- ~900,000 tonnes CO<sub>2</sub> /year
- Sequestration in Mt. Simon Sandstone saline fm.
- Total Project: \$208 MM; DOE Share: \$141 MM (68%)



#### Key Dates

- Phase 2 Awarded: June 15, 2010
- FEED Completed: April 2011
- NEPA FONSI: April 2011
- Construction started: May 2011
- UIC Class VI Injection Well Permit: Sept. 2014; UIC Class VI Operating Permit: Early 2016
- Sequestration start at full rate: 1Q-2017

#### Status

- Construction ~99% complete Apr. 2016
- Two monitoring wells drilled: Nov. 2012
- New Hans substation energized: Nov. 2014
- Commissioning compression and dehydration system completed: Sept. 2015
- Injection well drilled completed: Sept. 2015
- Waiting for final EPA authorization to start CO<sub>2</sub> injections using Class VI UIC permit.



## Draft Outline

- **1. Introduction:** CSLF Purpose (US-DOE), Task Force Mandate (US-DOE), overview/Benefits of BECCS (US-DOE)
- **2. Commercial Status of BECCS:** Planned and Existing Projects, Government Programs, Market Drivers for BECCS Deployments, Barriers to Large-scale BECCS Demonstration and Deployment, Opportunities and Recommendations for Overcoming Barriers
- **3. Overview of BECCS Technology Options and Pathways:** (Power; Fuels and Chemicals Production; Industrial sources; Summary of technical challenges and R&D opportunities)
- **4. Summary of Resource Assessments and Emissions Profiles:** (Existing reports and analyses. Biomass and Carbon Storage Resource Assessments (co-located?); Direct and indirect GHG emissions; Summary of Lifecycle Assessments; Identify gaps in analyses and future opportunities)
- **5. Summary of Economic Analyses for BECCS concepts**
- **6. Findings and Recommendations**



## Next Steps

- Assign/volunteers for section leads to draft report
- Work with IEA Bioenergy team on their BECCS efforts
  - Understand their approach and efforts
  - Leverage work
- Membership – Always room for more assistance