



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

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Technical Group Meeting
London, United Kingdom
June 28, 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



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 CO₂ for EOR

Carbon Sequestration Leadership Forum

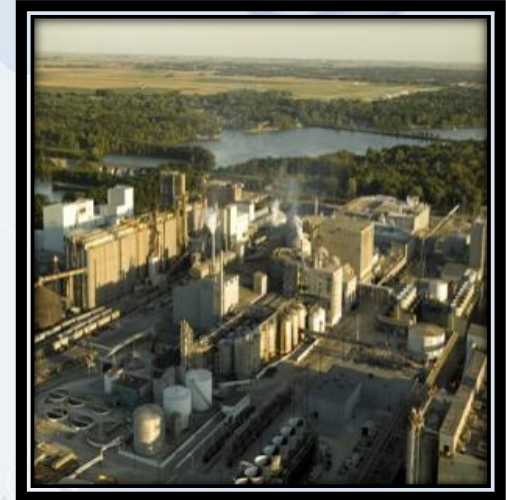
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Archer Daniels Midland Company ICCS Project

CO₂ Capture from a Biofuel Plant

- Decatur, IL
- CO₂ (>99% purity) is a by-product from production of fuel-grade ethanol via anaerobic fermentation
- Up to 90% CO₂ capture, dehydration (via tri-ethylene glycol) & compression
- ~900,000 tonnes CO₂ /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 CO₂ injections using Class VI UIC permit.



Report Focus? Some ideas to work through

- LCA (emissions) and economics – summarize current findings, identify gaps
- Current projects and business cases – identify and summarize global efforts, successes, challenges to deployment
- Technical
 - Focus on capture and the facility?
 - What are the unique challenges for capture technologies to be deployed at biopower, biofuels, pulp and paper, waste incineration, etc.?
 - Keep focus on all biomass options, more narrowly define, combine with industrial?



Next Steps

- Work with IEA Bioenergy team on their BECCS efforts
 - Understand their approach and efforts
 - Leverage work
- Definition and focus of the report
- Membership – Let me know if interested!