CCSI

Carbon Capture Simulation Initiative

CCSI Industry Engagement

Dr. John H. Shinn

Coordinator, CCSI Industry Advisor Board

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U.S. DEPARTMENT OF ENERGY

Industry Engagement Strategy

- Meet CCSI Mission: “Accelerate Deployment”
- Approach:
  - Assure use of CCSI product tools by building committed set of end-users in key areas of carbon capture deployment chain
    - Involve end-users in overall program direction, periodic reviews, and in tool development.

    The most committed end-users are intimately involved with tool development.

    Begin deploying components of tool set as early as possible to maximize benefit to commercialization efforts.

    Identify and pursue opportunities to create tools that serve additional purposes beyond carbon capture.

    E.g. Improvement in dense solid fluid dynamics models.

    Computational approaches to screening process performance of diverse materials.

Several Levels of Engagement

- Program oversight
  - Industry Advisory Board
    - Programmatic level tracking, review and guidance
    - Technical management of major corporations involved in carbon capture technology development and application and advanced computation.

- Direct technical involvement
  - Collaborators
    - Technical experts engaged directly at **Program Element Level** in tool development
    - Ensuring tools are **credible and relevant** to industry needs and that **industry expertise and data are being applied** to tool development.
    - Facilitate early transfer and uptake.

Current Active IAB Participants

Technology Providers	Power Generation	Design and Construction	Other Parties
Babcock & Wilcox	Southern California Edison	Fluor	Eastman Chemical
GE	Duke Energy	URS	Dupont
ADA Environmental	Southern Company	Burns and McDonnell	Boeing
Air Products	National Carbon Capture Center		ExxonMobil
Alstom	EPRI		Chevron

IAB Engagements

- Monthly Conference Calls
  - Updates on latest CCSI developments
  - Technical progress reports of individual program elements
  - Planning and follow-up on workshops
  - Maintain engagement of members

- Bi-Annual Workshops
  - Task progress reviews/model demonstrations
  - IAB input session
    - Presentations by IAB member companies of their internal programs, needs, concerns
    - Management of key issues, e.g. IP
  - IAB review and feedback session
    - Closed-door discussions
    - Generation of observations and recommendations to CCSI management
  - Products:
    - Written IAB report summarizing observations and recommendations
    - Interaction with CCSI technical leadership on appropriate responses
    - Response document from CCSI to IAB

- Programmatic Support
  - Represent Industry commitment to CCSI to external parties, reviewers
    - E.g. Jan 2011 DOE Review, external conferences
  - Identify data and expertise resources
  - Recruit additional members
  - Network with Industry engagement leaders of other DOE programs

- In-kind value of IAB member participation $300-500,000 per year;
  operating cost ca 3% of CCSI budget.

Key Observations and Recommendations Sep 2011 Workshop

Section 1. Top Level Messages

1. **Overall program progress is commended Excellent evidence of coordination among contributing labs and across Tasks.**

2. **The IAB commends the workshop format and recommends an expansion of the time allotted for presentation of results in future workshops.**

3. **Strong support for overall approach.**

4. **Strong support for many of the tools being developed.**

5. **Key areas for further focus identified**. E.g. **cost estimation, validation of modeling results**, **risk analysis and decision support,** models capable of reliably predicting device **performance at full scale** in advance of having full scale validation data.

6. **Resolution of IP ownership recommended**. Possibility of division of IP at tools/derivatives interface.

7. **Grow Industry Collaboration**.

Industry Engagement Plan

- 2011 Build and Engage IAB
  - Grow and sustain IAB membership
    - Identify and engage key partners
    - Create a collaboration space for parties involved in carbon capture and advanced computation
  - Involve IAB in key program decisions e.g. IP
- 2012 Extend IAB engagement; Build Collaborations
  - Grow IAB involvement in more regular technical progress review
    - Workshops and monthly single task updates
    - Extend involvement of key partners
  - Build direct involvement of IAB member company experts in CCSI tool development

Collaboration Successes and Directions

- Goal: Establish working-level involvement of key end-user organizations in CCSI tasks.
  - Based on match of interest and capability
  - Builds end-user community with clear stake in CCSI output
    - Critical to uptake of CCSI tools

- Existing Collaborations
  - ADA Environmental
    - Extensive collaboration providing data from pilot studies and applying CCSI tools to scale-up
    - Test case for IP management issues
    - Good engagement model for other collaborators
  - Babcock and Wilcox
    - Identified and funded internal experts to three CCSI Task teams
  - GE, Fluor
    - Established internal 2012 budgets for collaborators and identified likely experts for engagement in CCSI

CCSI Industry Engagement Conclusions

- Industry engagement in CCSI is very strong
  - Multiple members from all levels of CC technology chain
  - Strong involvement at programmatic level
  - Strong support for CCSI to DOE and with member internal programs
  - Growing involvement at collaboration level

- Regular program reviews are effective in steering CCSI toward higher quality products, greater probability of industry uptake and impact

- Good start to collaboration effort; focal point of 2012.

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