



CCSI

Carbon Capture Simulation Initiative

CCSI Toolset Demonstration & Discussion

2014 NETL CO₂ Capture Technology Meeting

Tuesday, July 29, 2014 at 5:45 pm



Lawrence Livermore
National Laboratory



U.S. DEPARTMENT OF
ENERGY

Objectives

- Demonstrate the capabilities of the CCSI Toolset to make industrial participants at this meeting aware of the potential use of these computational tools and model to accelerate their technology development.
- Discuss opportunities for companies to use the CCSI Toolset and collaborate in its continued development.

Format

- Short overview presentation describing the tools, models and their application
- Interactive discussions and computer demonstrations of the actual tools and models

Background

CCSI is developing, demonstrating and deploying advanced computational tools and models to accelerate the development of next generation carbon capture technologies, specifically the development of cost effective carbon capture technologies. Following an initial release in 2012, the latest generation of the CCSI Toolset was released on October 31, 2013. This release includes 12 new products and significant updates to 11 products from the previous release to provide new capabilities and improved usability. The new tools include:

- FOQUS: an integrated framework for Optimization and Quantification of Uncertainty and Sensitivity
- ALAMO: for building surrogate models to enable large scale optimization
- A validated CFD model to predict particle attrition
- D-RM Builder to create reduced models of dynamic simulations to enable more effective study of the operational characteristics of potential carbon capture systems
- BSS-ANNOVA, which enables the use of advanced Bayesian statistical methods for calibration and validation of models
- New basic data submodel for a high-viscosity carbon capture solvent following CCSI's expansion into this area less than a year ago
- A complete listing of the new components of the CCSI Toolset is available from www.acceleratecarboncapture.org

Five companies are already licensing the tools, and other companies are actively negotiating licenses. The final release of the completed toolset is planned for January 2016. The CCSI Industry Advisory Board includes energy technology providers (such as Babcock & Wilcox, GE, Fluor and Alstom), chemical companies (such as Eastman Chemical and Air Products), and petrochemical companies (such as ExxonMobil, Chevron, and Phillips 66).

CCSI is led by the National Energy Technology Laboratory (NETL) and leverages the DOE national laboratories' core strengths in modeling and simulation, bringing together the best capabilities at NETL, Los Alamos National Laboratory (LANL), Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), and Pacific Northwest National Laboratory (PNNL) as well as the unparalleled expertise in multiphase flow reactors, combustion, process synthesis, optimization and control for energy processes at Carnegie Mellon University, Princeton University, West Virginia University, Boston University, University of Texas, and the University of Utah.