

**MEHC – PacifiCorp
Integrated Gasification Combined Cycle Working Group**

**Wednesday, October 25, 2006
9:00 am – 2:00 pm (Pacific Time)
10:00 am – 3:00 pm (Mountain Time)**

Meeting Summary

California	Not represented
Idaho	Terri Carlock (IPUC)
Oregon	Justin Klure (ODOE), Ed Durrenberger (OPUC), Steve Weiss (NW Energy Coalition), Irion Sanger (ICNU)
Utah	Sam Liu (DPU), Cheryl Murray (CCS), John Harvey (UT-PSC), Carol Revelt (UT-PSC)
Wyoming	Steve Ellenbecker (Wyoming Governor’s Office), Bryce Freeman (WY-OCA)
PacifiCorp	Salt Lake City: Nick Rahn, Jim Lacey, Ian Andrews, Ken Layton Portland: Laura Beane, Kyle Davis, Greg Duvall, Melissa Seymour Phone: Bob Tarantola, Cathy Woollums (MidAmerican Energy Holdings Co.)
Other	Kathy VanDame (Wasatch Clean Air Coalition), Milind Deo (Univ of Utah), Roger Swenson (E-Quant), Eric Guidry (Western Resource Advocates), Colby Drechsel (Wyoming Pipeline Authority), Adel Sarofim (Univ of Utah), Kevin Whitty (Univ of Utah), Jim Grant (Alstom), Nancy Mohn (Alstom), Steve Orsini (Alstom), Regg Olsen (Utah DAQ), Glad Sowards (Utah DAQ), Ron Daniels (Utah Energy Policy), Kelly Francone (UAE), Phil Porlick (Utah DNR), Brian McPherson (SW Partnership on Carbon Sequestration), David Curtis (Univ of Utah), Ray Levey (Univ of Utah)
Phone-In	Nancy Kelly (Utah CCS), Steve Waddington (WIA), Vicki Stamp (CO ₂ Program Manager-DOE), Liangxiong Li (Univ NM), Jason Eisdorfer (CUB), Robert Pomeroy (Holland & Hart)

Introduction

This was the fifth meeting of the Integrated Gasification Combined Cycle (IGCC) Working Group. The following presentations were made:

Clean Coal Combustion, Alstom, by Nancy Mohn & Steve Orsini

Overview on the use of CO₂ in the Permian Basin for Enhanced Oil Recovery
- Kinder Morgan, Russell Martin for Bob Cawood

EOR - CO₂ Sequestration: Mating Vent Stack CO₂ with Enhanced Oil Recovery Projects, Blue Source by Russell Martin

Water consumption impacts of IGCC with CO₂ Capture, PacifiCorp by Jim Lacey

Summary of Presentations

The meeting was held in Salt Lake City and video-linked with PacifiCorp's Portland office. A number of individuals also participated via phone. The meeting agenda and presentations had been posted on the PacifiCorp IGCC Working Group site (<http://www.pacificorp.com/Article/Article66610.html>) on October 25, 2006.

The first presentation was made by Nancy Mohn of Alstom on clean coal combustion. Alstom is a major supplier of power boilers, steam turbine generators, air quality control systems (scrubbers, baghouses, and precipitators), and other major power generation equipment. Alstom does not design or supply gasifiers or IGCC plants. Alstom's presentation focused on the need to bring to market a coal-based power generation process with reduced CO₂ emissions. Alstom's strategy to achieve this objective is to combine a more efficient power generation process with a low cost CO₂ capture process. Alstom is working together with the Electric Power Research Institute (EPRI) to install and test a 5 MW chilled ammonia demonstration plant at We Energies' Pleasant Prairie plant. The chilled ammonia process holds promise as a potential lower cost alternative for CO₂ capture from the flue gas from a pulverized-coal plant in comparison to an amine-based CO₂ capture technology. Studies performed to date that compare the cost of electricity from an IGCC plant with CO₂ capture to the cost of electricity from a pulverized coal plant with CO₂ capture, show that the IGCC configuration is typically lower. This comparison is made using a high-cost, high auxiliary load amine-based technology applied to a pulverized coal plant. The Alstom/EPRI demonstration project will evaluate the potential the chilled ammonia process as a competitive alternative for pulverized coal to IGCC with CO₂ capture. The chilled ammonia process could also potentially be installed on existing pulverized coal plants. Nancy Mohn can be reached at nancy.c.mohn@power.alstom.com.

The second presentation was made by Kinder Morgan, a leading energy company that both provides CO₂ and operates oil fields utilizing CO₂ for enhanced oil recovery in the Permian Basin. The presentation was made by Russell Martin, who recently worked for Kinder Morgan. The presentation provided a history of the development of the sources, sinks, and transportation paths of CO₂ used for enhanced oil recovery (EOR) in Permian Basin.

The third presentation, also made by Russell Martin of Blue Source, was on the major issues associated with structuring an agreement for selling/transporting/buying CO₂. Traditionally, the owner of the CO₂ source and the user has been one and the same. The market has changed and now agreements need to be put in place between the seller, transporter, and buyer. The presentation identified the various issues and concerns of each party. Russell Martin made that point that as the market moves from CO₂ use for EOR to pure sequestration, that the issues associated with liability associated with sequestration need to be addresses at either a state or federal level.

In response to a request at the last IGCC Working Group meeting, PacifiCorp made a brief technical presentation on the potential increase in water consumption for an IGCC plant with 90% CO₂ capture to an IGCC plant with no CO₂ capture.

Issues Raised at the Meeting

Other than the presentations, two major issues were raised. The first issue raised was that one of MidAmerican's acquisition commitments was to address the *allocation of risk between shareholders and ratepayers of additional carbon dioxide emissions in the event PacifiCorp proceeds with a coal unit that is not able to capture and store carbon emissions*. A representative from PacifiCorp Regulation will coordinate that discussion at the next meeting of the IGCC Working Group. The question was raised whether it would be productive to combine this discussion with the next Global Climate Change Working Group, given the overlap of interest in CO₂ issues. It was agreed that it would be helpful to consolidate the IGCC Working Group and the Global Climate Change Working group for the next scheduled meeting. It was clarified that this combined session would be a one-time occurrence; however, there appears to be a strong interest in combining the two working groups permanently. The topic of combining the working groups will be revisited at the November meeting.

Future Meeting Topics

The group identified the following as potential topics or areas of interest for the next meeting:

1. CO₂ Risk allocation discussion (referenced above).

2. A presentation by other suppliers, other technologies, DOE/EPRI projects looking at CO₂ capture on pulverized coal plants.
3. A presentation of PacifiCorp's 2005 CO₂ emissions production portfolio.
4. An overview of the CO₂ profiles of the various IRP resource portfolios.
5. A comparison of mercury emissions capture technology from both pulverized coal and IGCC plants.

PLEASE FORWARD IDEAS FOR FUTURE TOPICS OR AGENDA ITEMS FOR THE IGCC WORKING GROUP MEETINGS TO IAN ANDREWS (Ian.Andrews@pacificorp.com, 801-220-4286).

Next Scheduled Meeting of the IGCC Working Group

The next IGCC Working Group Meeting is scheduled for Tuesday, November 28, 2006 starting at 10:00 AM (Mountain), 9:00 AM (Pacific). This meeting will be held in conjunction with PacifiCorp's Global Climate Change Working Group.

The meeting in Salt Lake City will be held in room 130 K at the North Temple Office, 1407 West North Temple, Salt Lake City, Utah.

The meeting in Portland will be held in PacifiCorp's offices in room 1075 G at the Lloyd Center Tower, 825 NE Multnomah, Portland, Oregon. A room change may be possible.

A video-link will connect the two meetings. A proposed agenda and dial-in information will be circulated in a meeting notice.