

# PacifiCorp IGCC Working Group

**Thursday, July 6, 2006**  
**10:00 am – 3:30 pm (Mountain Time)**

## Meeting Summary

---

<b>Idaho</b>	Harry Hall (Idaho Public Utilities Commission)
<b>Oregon</b>	Jason Eisdorfer (Citizens Utility Board of Oregon)
<b>Utah</b>	Sam Liu (Utah Division of Public Utilities), Cheryl Murray (Utah Committee of Consumer Services), Regg Olson (Utah Division of Air Quality), Matthew McNulty (Utah Associated Municipal Power Systems), Andrea Coon (Utah Division of Public Utilities), Kelly Francone (Energy Strategies LLC), John Harvey (Utah Public Service Commission), Becky Wilson (Utah Public Service Commission), Carol Revelt (Utah Public Service Commission), Ron Daniels (Utah Division of Oil, Gas, and Mining), Brock LeBaron (Utah Division of Air Quality), Rick Allis (Utah Geological Survey), Bridgette Steffen (Utah Clean Energy), Kathy Van Dame (Wasatch Clean Air Coalition)
 <b>Wyoming</b>	Steve Ellenbecker (Wyoming Office of the Governor)
<b>PacifiCorp/MEHC</b>	Nick Rahn, Jim Lacey, Greg Betenson, Bill Whitney, Greg Duvall, Pete Warnken, Shane Holst, Brian Dickman
<b>Other</b>	Kevin Whitty (University of Utah), Eric Eddings (University of Utah), Ray Knudsen (Petroleum Technology Research Centre), Adel Sardfim (University of Utah), Liangxiong Li (New Mexico Tech), Brian McPherson (New Mexico Tech), Roger Swenson (E-Quant Consulting), Rod DeBruin (Wyoming Geological Survey), Vicki Stamp (Rocky Mountain Oilfield Testing Center, U.S. Department of Energy), Jim Steidtmann (University of Wyoming), Tim Wagner (Sierra Club), David Curtiss (University of Utah), Raymond Levey (University of Utah)

---

### Introduction

This was the second meeting of the Integrated Gasification Combined Cycle (IGCC) technology working group. The primary focus of the meeting was to discuss carbon capture and sequestration as it may apply in the west and to IGCC plants.

### **Meeting Agenda**

Introduction

Estimated Costs Carbon Capture – Jim Lacey

Southwestern Regional Sequestration Partnership - B.J. McPherson – New Mexico Institute of Technology & Southwestern Regional Sequestration Partnership

CO<sub>2</sub> Capture Technologies - Liangxiong Li – New Mexico Institute of Technology & Southwestern Regional Sequestration Partnership

IGCC and Carbon Capture - Adel Sarofim – University of Utah & Southwestern Regional Sequestration Partnership

Wyoming Enhanced Oil Recovery - Jim Steidtmann - Enhanced Oil Recovery Institute

Carbon Dioxide in Wyoming - Rod DeBruin - Wyoming Geological Survey

Weyburn Sequestration Experience - Ray Knudsen - Petroleum Technology Research Center

General Discussion

Next Meeting

### **Presentations**

The majority of the meeting was spent listening to the presentations as outlined in the agenda. Copies of the presentations are on the Working Group website including the attendance list. Additional papers on the website include the sequestration studies from Rick Allis specific to the Hunter and Bridger sites.

### **Discussion**

After the presentations a discussion on the direction and focus of the Working Group was held. Initiated by Steve Ellenbacher of the Wyoming Governor's Office, the request was made that the relevance of the Working Group to PacifiCorp's decision making should be a focus of the next meeting. Specifically the desire expressed at the previous Working Group meeting to understand what PacifiCorp needs to move forward on an IGCC was requested. Also, Mr. Ellenbacher stressed the importance of an effective process for capturing and utilizing information shared in the Working Group meetings.

The ability to enhance the production of coal-bed methane wells with the addition of CO<sub>2</sub> was discussed. The general consensus was that coal-bed methane enhancement is considerably behind EOR technically and more demonstration work was necessary to understand the coal-bed methane dynamics. As a result, the options are considerably reduced in both Utah and Wyoming for coal-bed methane CO<sub>2</sub> floods over the next 15 years. One reason for the concern with coal-bed methane is the more shallow occurrence of this resource which jeopardizes the ability to hold the CO<sub>2</sub> for long periods. Coal-bed methane wells maybe more prone to leak as a geologic storage option for CO<sub>2</sub>.

Rick Allis briefly described the potential for sequestration near both the Jim Bridger site and the Hunter site. A copy of his papers will be posted on the Working Group website.

The comments was expressed that Utah state government maybe well advised to begin a EOR working group similar to the Wyoming Enhanced Oil Recovery Institute represented by Jim Steidtmann. This group could encourage development of EOR opportunities in southeastern Utah.

The open question was posed to the experts in the meeting about the validity of the PacifiCorp assumption of \$10/ton for the cost of transportation, injection, storage, and monitoring of CO<sub>2</sub> sequestration. The response was a general recognition that the \$10/ton is a reasonable number because it is the EPA target for the sequestration partnerships. There was no

### **Future Meetings**

Topics for the next meeting were discussed. The following areas were identified;

- More detailed cost comparisons of IGCC and PC plant carbon capture and sequestration economics.
- More detailed cost comparisons of IGCC and PC plants at specific sites.
- Additional sequestration discussions
  - Big Sky Partnership and West Coast Options
  - Rick Allis to discuss the studies for specific PacifiCorp sites
- Discussion of Cap and Trade issues for CO<sub>2</sub> and implications from those (suggested AAPG as a resource). Specifically discuss potential regulation in Oregon and Washington on CO<sub>2</sub> emissions to the IGCC/PC decision.
- Poly-generation and the ability to leverage the cost of electricity to rate payers through the commercial production of secondary byproducts.
- More discussions on the needs of PacifiCorp to move forward on IGCC, including state cost recovery and allocation issues.
- The Interstate Oil & Gas Compact Commission's regulatory framework for carbon capture and storage.

It was agreed that the next meeting would be held on August 3, 2006. The meeting time will be at 10:00 MDT at the usual locations. It was agreed that if possible copies of any presentations would be made available before the meeting to facilitate people joining by phone. The presentations, attendance list, and minutes will be posted on a Working Group website.

The tentative agenda for the next meeting will be additional sequestration discussions on the Big Sky partnership and site specific studies. These presentations would be followed by an extensive discussion on the barriers to IGCC development within PacifiCorp. It is hoped that half or more of each meeting would be devoted to general discussions to reach consensus on the previously identified issues around IGCC facing the Company.