

September 28, 2007

APPENDIX D

Outreach Initiatives

SCHOOL OF ENERGY RESOURCES LECTURE SERIES



FEATURING

Zhangxin Chen, Ph.D.

a researcher at
Southern Methodist University's Center for
Scientific Computation

3 p.m., Monday, September 18
Wyoming Union Family Room

A prolific researcher and author, Chen will present an overview of the current problems and the state-of-the-art methods on the development of laboratory experiments, mathematical modeling, and computer simulations for heavy oil reservoirs.

"During the next several decades, there is not and there will not be an economical, abundant substitute for crude oil in the economies of industrial countries, even with the price of a barrel of oil at more than \$70," Chen says.

The conventional (light and medium) oil resources discovered up to the end of 2002 will last at most 40 years at 2002's production rate, he says. Maintaining the supply needed to support these economies and enable them to grow means that significant additional crude reserves must be developed. Chen says the additional development will be primarily in the form of the sole alternative - heavy crudes.

He adds that while the vast heavy and ultra-heavy oil fields will dominate the world's oil production in the next several decades, many of the heaviest hydrocarbons are waiting for new technologies that will transform them into economically feasible projects.

"A mathematically- and numerically-based understanding of the production mechanisms for these reserves is urgently required," Chen says.

More information about the SER is available on the Web at www.uwyo.edu/ser.



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New Thinking

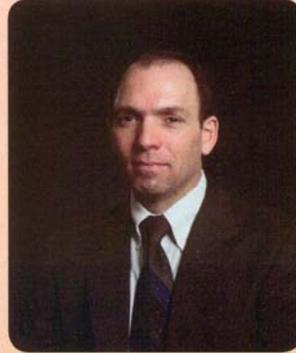
SCHOOL OF ENERGY RESOURCES

SCHOOL OF ENERGY RESOURCES LECTURE SERIES

FEATURING

Richard D. Boardman, Ph.D.

Sr. Engineer and Research Lead
Alternative Fuels & Energy
Idaho National Laboratory



DATE

4 p.m., Monday, October 23
Wyoming Union Family Room

Gasification: Implications for the Future

This seminary will consider the importance of gasification as a technological solution for converting coal, biomass, and other opportunity fuels to electrical power, chemical feedstock, and transportation fuels. While focusing on important technical aspects and research needs in gasification, Dr. Richard Boardman will also touch on environmental and ecological aspects of this re-emerging technology. His seminar will be targeted to students and faculty in Engineering, Resource and Ecology Economics, Energy Development, and Environmental Sciences.

BIOGRAPHY: Dr. Boardman has a doctorate degree in chemical engineering with an emphasis in energy and environment sciences. As a former research member of the Advanced Combustion Engineering Research Center at Brigham Young University and the University of Utah, he gained broad education in combustion and fossil energy research topics, including comprehensive fluid dynamic combustion modelling and measurement of combustion phenomena in coal combustors and oxygen blown gasifiers. His specialty areas include pollutant formation kinetics and control processes.

Dr. Boardman is a recipient of the Idaho Academy of Sciences Distinguished Engineer of the Year Award. He is frequent invited panel member for conferences and workshops on mercury removal and gasification. He is an advocate of student internships at National Laboratories. He is currently a part-time faculty for the University of Idaho and Brigham Young University, providing instruction in Combustion Processes and Nuclear Chemical Engineering. Finally, he supports the Wyoming Clean Coal Working Group for advancement of coal utilization in the State of Wyoming.



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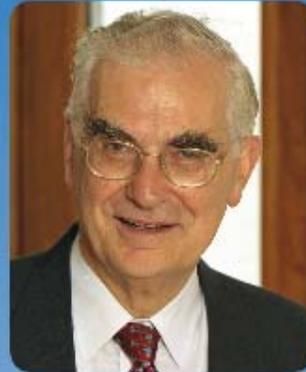
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SCHOOL OF ENERGY RESOURCES SPEAKER SERIES

FEATURING

**Ernest Ronald Oxburgh,
Baron Oxburgh, KBE, FRS, Ph.D.**

Geologist and past Rector of Imperial College
Non-executive chairman of Royal Dutch Shell PLC
from 2004-5



DATE

4 p.m., Monday, January 29
Agriculture Auditorium

Energy in a Changing Climate

Lord Oxburgh is a graduate of the University College, Oxford and Princeton University (Ph.D.) where he worked for the famous geologist Harry Hess. He has taught geology and geophysics at the Universities of Oxford and Cambridge. At Cambridge he was head of the Department of Earth Sciences and President of The Queens' College. He has been a visiting professor at Stanford, Caltech, and Cornell. From 1988 to 1993, Lord Oxburgh was chief scientific adviser to the Ministry of Defence, and rector of Imperial College of Science, Technology, and Medicine from 1993-2000. He was non-executive chairman of Royal Dutch Shell PLC from 2004-2005.

He was knighted (KBE) in 1992 and made a Life Peer (crossbench) as Baron Oxburgh, of Liverpool in the County of Merseyside in 1999, where he sits on the House of Lords select committee on science and technology.



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FEATURING

Judi Johansen

Current director of Schnitzer Steel, Kaiser Permanente, IdaCorp, and Cascade Bancorp.

Former president and CEO, PacifiCorp, 2001-2006



DATE

4 p.m., Monday, April 30
Union Family Room

New Developments in Energy Policy and Technology

Ms. Johansen was President and CEO of PacifiCorp from June 2001 to March of 2006. She was elected to the Scottish Power PLC Board of directors, parent company of PacifiCorp, in 2003. She served as Executive Vice president for PacifiCorp's Regulation and External Affairs from December 2000-June 2001. She currently serves as a director of Schnitzer Steel, Kaiser Permanente, IdaCorp, and Cascade Bancorp. She is a member of the the Port of Portland Commission with her term ending 2009. She also serves as a Trustee for the Oregon Nature Conservancy.

Ms. Johansen served as the Administrator and Chief Executive Officer of the Bonneville Power Administration from 1998-2000. Prior to that she served in various executive positions between 1992 and 1998 for Washington Water Power and Bonneville Power Administration.

In 1986, she joined the Tacoma, Washington, law firm of Gordon, Thomas, Honeywell, becoming partner in 1989. From 1983 to 1986, she served as a staff attorney for the Public Power Council, a trade association of northwest consumer-owned electric utilities.



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UNIVERSITY OF WYOMING

New Thinking



Energy Futures: Global Changes that Challenge Wyoming - Casper College

A FREE public evening lecture series held in Casper from the University of Wyoming Institute of Environment and Natural Resources.

These lectures in Casper lead up to Stroock Forum: Energy: The Ultimate Brew on Wednesday November 15th in the Union Ballroom on the UW Campus in Laramie.

In this public lecture series, we'll look several decades into the future at potential changes in energy demand and energy sources on the world market. The discussions will focus on what these changes mean for Wyoming.

Time and Location for CASPER events, Sept. 14-Nov. 16:

7-9 pm, Thursday evenings
Wheeler Auditorium, Wold Physical Sciences Building, Casper College campus

Thanks to our sponsors:

University of Wyoming Ruckelshaus Institute and Haub School of Environment and Natural Resources

The Stroock Forum on Wyoming Lands and People

UW Outreach School

UW/Casper College Campus

Casper College

Casper Star-Tribune

For more information on the lecture series please contact the UW/CC office: (307) 268-2713

Moderator: Anne Mackinnon: Anne MacKinnon, BA Harvard University 1973, JD University of California, Berkeley, 1981. MacKinnon is an adjunct professor for the University of Wyoming's Helga & Otto Haub School of Environment and Natural Resources, and a consultant in public discussion of natural resource policies, putting on programs for the university, state agencies, and other entities. She is a member of the state Water Development Commission, an inactive member of the Wyoming State Bar, and former editor-in-chief of the Casper Star-Tribune.

Thursday, Sept. 14 OIL AND GAS – A WYOMING FOCUS

Ron Surdam, Wyoming State Geologist

Mick McMurry, Nerd Gas LLC, Casper

Thursday, Sept. 28 CLIMATE CHANGE

September 28, 2007

Paste in agenda from WRI report for both workshops

UNIVERSITY OF WYOMING

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energy resources



**COAL
GASIFICATION:
WHAT DOES IT MEAN
FOR WYOMING?**

**FREE ONE-DAY
PUBLIC SYMPOSIUM**

**WEDNESDAY FEBRUARY
28, 2007
HOLIDAY INN ON THE
RIVER
CASPER, WYOMING**



Keynote
Speaker
ERIC REDMAN

**IS AN
AUTHORITY ON
IGCC
WHO HAS BEEN
IN-
CLUDED IN THE 2007
EDITION OF
THE BEST LAWYERS IN
AMERICA IN THE
SPECIALTY AREA OF
ENERGY LAW.**

**INTEGRATED GASIFICATION COMBINED CYCLE
(IGCC) IS A GASIFICATION PROCESS FOR
GENERATING POWER WITH SIGNIFICANTLY
LOWER EMISSIONS THAN WITH STANDARD
PULVERIZED COAL COMBUSTION.**

**LAST YEAR, GOVERNOR FREUDENTHAL AND
CALIFORNIA GOVERNOR ARNOLD
SCHWARZENEGGER SIGNED A MEMORANDUM OF
UNDERSTANDING FORMING A JOINT TASK
FORCE TO WORK WITH THE U.S. DEPARTMENT
OF ENERGY TO TAKE ADVANTAGE OF FEDERAL
FUNDING OPPORTUNITIES FOR A COMMERCIAL-
SCALE IGCC COAL PROJECT WITH CARBON
SEQUESTRATION IN WYOMING.**

**COAL GASIFICATION IN GENERAL AND IGCC IN
PARTICULAR ARE POTENTIALLY VERY
IMPORTANT TECHNOLOGIES FOR THE STATE,
THE NATION, AND THE WORLD. THIS SEMINAR
FEATURES PRESENTATIONS AND DISCUSSIONS**

**Who Should Attend?
THIS SYMPOSIUM
PROVIDES AN
INTRODUCTION AND
VALUABLE
PERSPECTIVES FOR
• COAL INDUSTRY
LEADERS**

UNIVERSITY OF WYOMING

WesternResearch
INSTITUTE

SCHOOL OF
energy resources



CO₂ Sequestration: Opportunities for Wyoming

Free One-Day
Public Symposium

<http://www.westernresearch.org/SERSymposia>

Goals to reduce carbon dioxide in the atmosphere will result in changes to the energy industry in fossil fuel producing and power generating states such as Wyoming. Regional Carbon Sequestration Partnerships have been established and legislation has been enacted in individual states to address options for carbon capture and stable sequestration. These initiatives bring to the forefront both the challenges and opportunities for sequestration in Wyoming.

This symposium will address the following issues

- Sources and sinks for CO₂ in Wyoming.
- Technologies for capturing CO₂ for sequestration.
- CO₂ sequestration for beneficial uses, such as enhanced oil recovery and enhanced coal bed methane production.
- CO₂ storage in saline aquifers and abandoned oil and gas fields.
- Infrastructure needs for CO₂ sequestration.
- Measurement, monitoring and validation requirements for stable carbon sequestration.
- Risks and liabilities related to sequestered CO₂.
- Economics of CO₂ sequestration and its impact on power generation costs

The symposium is free, but registration is required.
To register or learn more, see www.westernresearch.org.

Wednesday April 4, 2007
Holiday Inn
Cheyenne, Wyoming



Keynote Speaker

Director of the U.S.
Department of Energy
National Energy
Technology Labora-

tory Carl Bauer oversees science and technology development for advanced coal power generation, hydrogen production, environmental control for existing plants, and carbon sequestration.

Who Should Attend?

This symposium provides an introduction and valuable perspectives for

- Coal industry leaders
- Educators and students
- Legislators
- Power industry planners
- Regulators
- State and local officials
- Wyoming citizens

Sponsored by

The University of Wyoming
School of Energy Resources
and
Western Research Institute

WCC ENERGY RESOURCES MANAGEMENT PROJECT



Introduction

On June 6, 2007, the Wyoming Conservation Corps (WCC) completed the Energy Resource Management Project with the Bureau of Land Management (BLM) Newcastle field office. The project was a first of its kind for a conservation corps, and was completed with the support of RockWell Petroleum. One WCC crew (8 students) completed a noxious weeds survey of the oil fields within Weston County where RockWell currently has production. The WCC has been invited back next year by both the BLM and RockWell to complete a similar project.

The completion of the first energy project has provided the WCC with credibility that has already led to increased industry support and interest in utilizing WCC crews in the future.



SER / WCC Background

Initially, the WCC was proposed as an amendment to the SER legislation during the 2006 Budget session. The amendment would have provided \$312,000, of startup funding. The amendment language placed a strong focus on industry involvement. The WCC amendment failed on the floor of the Senate on first read. UW administrators advised that there was potential for the program on campus and with SER.

The development of the WCC moved forward within the Environment and Natural Resources program during the remainder of the spring 2006, summer 2006, and fall 2006 semesters. During this development period the WCC received broad support from Wyoming's state and federal public land managers. Additionally, the WCC received support from Wyoming's energy industry.

From the outset the WCC has sought the support and input of Wyoming's energy industry. One of the WCC's goals is to introduce young adults in Wyoming to the natural resource management issues facing the state. It is important that students engaged in the WCC program are given the opportunity to learn first-hand about some of the natural resource management issues facing industry in Wyoming. Successful partnerships with industry in Wyoming have created unique opportunities and additional statewide support for the WCC and its mission.

During the spring 2007 semester, SER committed \$10,000 to the WCC with the condition that the WCC complete the WCC Energy Resources Management Project. The funding was intended to directly benefit the students engaged in the WCC program.

Energy Resources Management Project

It was determined that the BLM would offer the best opportunity for the students to gain an introduction to, and experience with, Wyoming's energy industry. Bob Bennett, Wyoming BLM State Director, was approached about the potential of completing an energy-related project. Under Mr. Bennett's directive the Newcastle field office was asked to sponsor the energy project.

The Newcastle field office contacted RockWell Petroleum about partnering with the WCC to complete a project. In January of 2007, a meeting was held in Newcastle with the BLM, RockWell, and the WCC to identify and agree on the specifics of the energy project. It was determined that a noxious weed survey would benefit both RockWell and the BLM and would be a good use of the labor provided by the WCC.

BLM Contact:

Vi Hillman
Newcastle Field Manger
p. 307.746.6602
Viola.Hillman@blm.gov

General Manager - Environment
7000 West Yellowstone Highway
Casper, WY 82604
p. 307.266.1825
smonninger@rockwellpetroleum.com

RockWell Contact:

Steve Monninger

The completion of the energy project by the WCC crew provided a unique opportunity for the students to learn first-hand some of the natural resource management issues facing the oil and gas industry in Wyoming. The students camped in the Black Hills and traveled each day to the oil field to complete the survey. Conducting the survey required the students to walk the various road right-of-ways and the areas surrounding the pump jacks and tank batteries. RockWell provided OSHA and MSHA trainings and gave them a tour of their mining operations in the area. RockWell also donated the handheld Global Positioning System units and maps used to locate and record the noxious weeds.

Throughout the completion of the project each student was given the opportunity to interact with both agency and industry employees. At the completion of the project the students met with Vi Hillman and discussed the project's importance to the BLM. Vi took the time to thank the students for their hard work and provided a tutorial on how to apply for jobs with the BLM. A summary of the project, along with pictures, has been submitted to the BLM monthly magazine for publication.

See attached for itemization of SER funds spent.

Current Industry Partnerships / Connections

- Minerals, Business, and Economic Development Committee
 - SF-85, establishing the Wyoming Conservation Corps, was sponsored by the Joint Minerals Committee During the 2007 legislative session.
 - Legislation provides \$312,000 appropriation of matching funds to incentivize the establishment of the program.
 - Legislation allows for matching funds to be utilized to complete projects with industry.
- Devon Energy
 - Donated a 2003 Crew Cab pick-up to the University for use by the WCC.
 - The WCC is currently developing an industry project with Devon.
 - Devon Community Ambassadors will meet with students to talk about importance of community service and civic engagement.
- Chevron
 - Donated \$2,500.
- Wyoming Department of Environmental Quality - Supplemental Environmental Project (SEP) Account.
 - The WCC has signed a memorandum of understanding with the DEQ that allows companies found in violation to direct a portion of the penalty to the University of Wyoming. These funds will be used by WCC crews to complete SEPs throughout the state.
- Petroleum Association of Wyoming (PAW)
 - WCC presented to the public lands committee on Aug 21, 2007.
 - PAW will run a short story about the WCC with contact info in its next newsletter.
- CBM Education Fair – Gillette, Wyoming
 - Informational booth, 2006 & 2007 fair.
 - Article about energy project in fair program.

CONAHEC Conference Trip
Summary for the UW School of Energy Resources
May 1, 2007
Anne Alexander, Director, International Programs

Thanks to the help of the UW School of Energy Resources, I traveled to the Consortium for North American Higher Education Collaboration (CONAHEC) 11th North American Higher Education Conference in Quebec City, Canada, April 25-27, 2007. This report provides a brief summary of the outcomes of this trip. I am pleased to provide more detailed information on any point in this report.

CONAHEC was founded by WICHE and the Mexican Association for International Education in 1993 as a way to keep higher education mobility at the fore after NAFTA came into effect. It was expanded to include Canada in 1997. It is based at the University of Arizona, and its members must either be a member of a national education association or accredited by a US accrediting agency. Its focus is to facilitate academic collaboration between educational institutions in the three member countries.

This conference had a broad range of topics to explore, including technical topics like credential evaluation and general topics like working toward enhanced student mobility across North American borders. A very broad array of participants attended, including representatives of national and provincial government agencies, private universities, and public universities. Approximately 300 participants attended.

Outcomes

- I was able to meet and have an extensive conversation with Francisco Marmolejo of the University of Arizona, the Executive Director of CONAHEC. I asked him about collaborative opportunities in energy research and student recruiting, including geology, engineering, and energy policy-related areas. He has asked that I email him this month, and he will work with UW to find partners both in Mexico and in Canada that we can begin to connect with. This will allow us to complement UW's existing efforts in Canada, and expand UW's reach in finding students interested in energy studies as well as provide expanded research partnerships in projects of mutual interest.
- I was also able to briefly meet Dino Roppo, International Education Officer in the Ministry of Advanced Education and Technology for the Government of Alberta. Unfortunately, he was coming as I was going, but we exchanged cards and I intend to write to him to see what kind of collaborative opportunities we might explore specifically with Alberta that would complement UW's existing efforts there. In the meantime, if you would like to visit the Ministry website on international education it is located at: <http://www.advancededucation.gov.ab.ca/IntlEd/>
- Also of potential interest was a session I attended that provided information on the North American Energy Working Group (NAEWG) and the Security and Prosperity Partnership (SPP). Both of these groups are government programs or "dialogues" that both include in their portfolios the promotion of energy security through collaborative research and harmonized commercial, security, transportation, and other policies. For information on the NAEWG, please visit <http://www.pi.energy.gov/documents/NAEWGindex020306.pdf>

For information on the activities of the SPP, some are summarized in this report under the Energy section:

http://www.spp.gov/2006_report_to_leaders/prosperity_annex.pdf?dName=2006_report_to_leaders

It might be worthwhile for SER and interested others to keep track of these two groups.

Eventually, each one could support government funded collaborative research programs.

I came away from this conference with several other good contacts and programmatic information (including a great French immersion program in Quebec), and an interest in continuing to expand UW ties with our North American neighbors. I am happy to share conference materials with anyone interested, and want to take this opportunity to thank the School of Energy Resources for helping to support this trip to CONAHEC.

Finding the Balance: Energy and Climate
October 8-10, 2007, Walk Festival Hall, Teton Village, Wyoming
DRAFT AGENDA

October 8, 2007

Summit Kick-Off

5:00 pm Reception

Welcome by President Buchanan with words from Jackson Mayor

7:00 pm Governor Dave Freudenthal (confirmed)

Wyoming's Place in the Energy-Climate Puzzle

7:30 pm Lord Ron Oxburgh, Former Chairman, Royal Dutch Shell PLC (Confirmed)

Global Future for Finding the Energy-Climate Balance

October 9, 2007

8:00 am Welcome, Overview and format, President Tom Buchanan, University of Wyoming

Morning Session – Climate (8:30 am to 12:00 noon)

8:15 am Susan Solomon, Senior Scientist, National Oceanic and Atmospheric Admin. (Invited)

Climate Science

9:00 am Stephen Schneider, Senior Fellow, Center for Environment Science and Policy of the Institute for International Studies, Stanford University (Confirmed)

Climate Policies

9:45 am Geoff Heal, Paul Garrett Professor of Public Policy and Business Responsibility, Columbia University (Confirmed)

Climate Economics

10:30 am BREAK

11:00 am Morning Session Respondents

Moderated audience Q&A session with speakers

12:00 pm Lunch

Afternoon Session – Energy Mix (1:30 pm to 5:00 pm)

1:30 pm Michael Economides, Professor of Chemical and Biomolecular Engineering, University of Houston (Confirmed)

Petroleum

2:15 pm Greg Boyce, President and CEO, Peabody Energy (Confirmed)

Coal

3:00 pm Ralph Cavanagh, Senior Attorney and Co-Director, Energy Program, Natural Resources Defense Council (Confirmed)

Energy Mix

3:45 pm BREAK

4:15 pm Afternoon Session Respondents

Moderated audience Q&A session with speakers

DRAFT 20 September 2007

Evening Keynote Address

7:30 pm **Jeff Immelt**, Chairman &CEO, GE (Invited)

October 10, 2007

8:30 am **David Siever**, Capital Technology, Inc.
Capital Markets for Energy Development (Confirmed)

9:15 am **Kipp Coddington**, Alston & Bird
Risk, Liabilities and Carbon Trading (Confirmed)

10:00 am BREAK

10:30 am **Distillation** Bill Blakemore, Climate Change Reporter, ABC (Invited)

11:00 am *What does this mean for Wyoming?*
Wyoming Decision-makers and Opinion Leaders Panel
Moderated by Bill Blakemore, ABC Correspondent (Invited)

12:00 am Lunch

1:30 pm Audience Q&A session with speakers and panelists
Moderated by Bill Blakemore, ABC Correspondent (Invited)

2:30 pm **Summit Wrap-up**, Governor Dave Freudenthal (Invited)

3:00 pm Press Conference