BASIN ELECTRIC POWER COOPERATIVE

1717 EAST INTERSTATE AVENUE
BISMARCK, NORTH DAKOTA 58503-0564
PHONE 701-223-0441
FAX: 701/224-5336

April 1, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, North Dakota 58505

Dear Ms. Fine

Enclosed are the original, one hard copy and an electronic copy of the proposal "North Dakota Partnership in the Canadian Clean Power Coalition Phase III". Also enclosed is the $100.00 application fee.

If you have any questions or comments, please contact me by phone at (701) 355-5701 or email at dschmitz@bepc.com. If I am not available, please contact Curtis Jabs at (701) 355-5428 or email at cjabs@bepc.com.

Sincerely,

David P. Schmitz, P.E.
Project Manager, NextGen Power Project
Basin Electric Power Cooperative

cj/as

minnesota power / 1259 nw 3rd street / cohasset, minnesota 55721 / 218-328-5036 / fax 218-328-6573 / arudeck@mnpower.com

Allan S. Rudeck, Jr.
Vice President
Generation Operations

Monday March 26, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

This letter is in support of a funding request by the North Dakota Lignite Interests facilitated by Basin Electric (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to new and existing conventional coal power plants. The CCPC phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota.

With the national interest in climate change, the future of coal is highly dependant of the development of carbon capture and management strategies. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Minnesota Power is committed to financially participating in membership in the CCPC Phase III Program and we urge your support for this program as well. Thank you for your time and consideration.

Sincerely,
Minnesota Power

c Mike Hummel – BNI Coal
Alan R. Hodnik – ALLETE- Minnesota Power
Eric Norberg – ALLETE - Minnesota Power
Dave McMillan – ALLETE – Minnesota Power
✓Dave Schmitz – BEPC

Great Northern Power Development L.P.

1022 East Divide, Suite E
Bismarck, ND 58501

Phone (701) 223-8783 Fax (701) 221-9895

March 26, 2007

Ms. Karlene Fine
Executive Director & Secretary
Industrial Commission of North Dakota
State Capitol 14th Floor
600 East Boulevard Avenue, Dept. 405
Bismarck, ND 58505-0840

Dear Ms. Fine:

This letter is in support of a funding request by Basin Electric (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to conventional coal power plants. The CCPC phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota

With the national interest in climate change, the future of coal is highly dependant of the development of carbon capture and sequestration. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Great Northern Power Development, L.P. is committed to financially participating in membership in the CCPC Phase III Program as part of our LV21 Phase IV and we urge your support for this program as well. Thank you for your time and consideration.

Please feel free to contact me at (701) 223-8783 if you have any questions regarding this matter.

Sincerely,

Richard A. Voss
Vice President, Great Northern Power Development L.P.

DAKOTA GASIFICATION COMPANY
A BASIN ELECTRIC SUBSIDIARY

MAILING ADDRESS:
P.O. BOX 5540
BISMARCK, NORTH DAKOTA 58506-5540
PHONE: 701/221-4400 FAX: 701/221-4450

STREET ADDRESS:
1600 EAST INTERSTATE AVENUE
BISMARCK, NORTH DAKOTA 58503-0561

March 30, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

This letter is in support of a funding request by Basin Electric (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to conventional coal power plants. The CCPC phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota

With the national interest in climate change, the future of coal is highly dependant of the development of carbon capture and sequestration. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Dakota Gasification Company is committed to financially participating in membership in the CCPC Phase III Program and we urge your support for this program as well. Thank you for your time and consideration.

Sincerely,

Gary G. Loop
Senior Vice President
and Chief Operating Officer

lk
cc: Dave Schmitz - BEPC

215 South Cascade Street
PO Box 496
Fergus Falls, Minnesota 56538-0496
218 739-8200
www.otpco.com (web site)

OTTER TAIL POWER COMPANY

March 30, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

This letter is in support of a funding request by Basin Electric (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to conventional coal power plants. The CCPC phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota

With the national interest in climate change, the future of coal is highly dependent on the development of carbon capture and sequestration. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Otter Tail Power Company is committed to financially participating in membership in the CCPC Phase III Program and we urge your support for this program as well. Thank you for your time and consideration.

Sincerely,

Terry Graumann
Manager, Environmental Services

MONTANA-DAKOTA
UTILITIES CO.
A Division of MDU Resources Group, Inc.

400 North Fourth Street
Bismarck, ND 58501
(701) 222-7900

March 31, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

This letter is in support of a funding request by Montana Dakota Utilities Co. (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to conventional coal power plants. The CCPC phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota

With the national interest in climate change, the future of coal is highly dependant of the development of carbon capture and sequestration. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Montana Dakota Utilities Co. is committed to financially participating in membership in the CCPC Phase III Program and we urge your support for this program as well. Thank you for your time and consideration.

Sincerely,

Andrea Stomberg
VP Electric Supply
Montana Dakota Utilities Co.

Cc: Dave Schmitz - BEPC

Westmoreland Power, Inc.

14th Floor, 2 North Cascade Avenue, Colorado Springs, CO 80903
Phone: (719) 442-2600 • Fax: (719) 448-5824

April 2, 2007

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

This letter is in support of a funding request by Basin Electric (on its own behalf and that of various other ND lignite users, producers and developers) for further membership in the Canadian Clean Power Coalition (CCPC). More specifically, this membership will be for the CCPC Phase III Program which will continue to support the development of advanced coal utilization technologies including gasification, oxy-fuel combustion, and various carbon removal technologies that can be applied to conventional coal power plants. The CCPC Phase III will have a major focus on low rank coals that are similar to North Dakota's lignite; therefore this program will benefit the lignite industry in North Dakota.

With the national interest in climate change, the future of coal is highly dependent on the development of carbon capture and sequestration. The CCPC Phase III Program will provide critical information to help North Dakota Lignite members with their assessment of advanced technologies capable of operating with lignite and having the capability of carbon capture.

Westmoreland Power, Inc. is committed to financially participating in membership in the CCPC Phase III Program and we urge your support for this program as well. Thank you for your time and consideration.

Sincerely,

Robert W. Holzwarth
President
Westmoreland Power, Inc.

cc: Dave Schmitz - BEPC

Grant Application
for a
North Dakota Partnership
in the
Canadian Clean Power Coalition Phase III

Presented to:
Ms. Karlene Fine, Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Submitted by:
David P. Schmitz, P.E.
Basin Electric Power Cooperative
1717 East Interstate Avenue
Bismarck, North Dakota 58503

Principal Investigator:
Canadian Clean Power Coalition
2901 Powerhouse Drive
Regina, Saskatchewan S4N 0A1

Funds Requested from
The North Dakota
Industrial Commission
$ 130,000

April 1, 2007

Table of Contents

ABSTRACT

Lignite Industry members seek to continue to be a partner with the Phase III Canadian Clean Power Coalition (CCPC). The CCPC (table below) is a partnership of utilities, producers and government agencies designed to accelerate the development and demonstration of clean coal technology in Canada.

Canadian Clean Power Coalition

Canadian Industry	**Canadian Government**
~ EPCOR Utilies Inc. ~ Nova Scotia Power Inc. ~ Saskatchewan Power Corp. ~ TransAlta Utilities Corp.	~ Natural Resources Canada ~ Alberta Energy Research Institute ~ Saskatchewan Industry & Resources

Phase III is a continuation of CCPC's Phase I & II. Phase III will continue its study for three years (2007- 2010) at an overall cost of $7.5 million (Canadian), with approximate $312,500 (Canadian) cost for each industry participant.

Phase III Objectives

- CCPC will continue in the role of champion for the use of coal and seek technical solutions to environmental concerns.
- Continue being an advocate for the development, funding, and construction of two demonstration facilities on low rank coal (lignite, subbituminous) with carbon capture capability.
- The role as developer of demonstration projects now passes on to other project developers. CCPC will explore and share "lessons learned" on these projects.

PROJECT SUMMARY

A Canadian partnership of utilities, government agencies and producers has initiated a program to accelerate the development and demonstration of clean coal technology in Canada. The original Clean Coal Clean Power Coalition members represented a national association of coal producers and over 90 percent of Canadian coal-based utilities. A technical committee provides leadership to the CCPC in the industry-lead partnership. Canadian participants and potential USA industry participants for Phase III are show in the table below.

Canadian Industry	**Canadian Government**	**USA Industry**
~ EPCOR Utilities Inc. ~ Nova Scotia Power Inc. ~ Saskatchewan Power Corp. ~ TransAlta Utilities Corp.	~ Natural Resources Canada ~ Alberta Energy Research Institute ~ Saskatchewan Industry & Research	~ Electric Power Research Institute (EPRI) ~ N.D. Industrial Commission ~ Basin Electric Power Cooperative ~ Dakota Gasification Co. ~ Great Northern Power ~ Montana-Dakota Utilities ~ Otter Tail Power Co. ~ Westmoreland Properties ~ Great River Energy ~ Minnesota Power

Proposed CCPC Phase III

- CCPC Phase II ended successfully with the completion of gasification and advanced supercritical technology studies and site specific business case studies in late 2006.
- Individual developers will use results to build & operate demo/commercial units independently of CCPC (e.g. Luscar, SaskPower, Alberta entities).

- Continue its role as a national body representing all Canadian coal producers & users and its advocacy and advisory role in advancing the case for clean coal with the Federal and Provincial Governments.
- Continue its role to advocate for the development, funding, and construction of two demonstration facilities, a supercritical pulverized coal plant using lignite coal and an IGCC plant using subbituminous that will both be designed to capture carbon dioxide emissions.
- Maintain & strengthen communication role among participants and externally.
- Continue the coordination of interactions between Canadian Industry & International clean coal initiatives.
- Conduct a Front End Engineering and Design (FEED) study for a 400 MW Integrated Gasification Combined Cycle (IGCC) plant with CO_2 capture (figure one, page 12). EPCOR has provided a host site at Genesee, and the Alberta Energy Research Institute (AERI) is providing in-kind and the industrial share of the funding for this work (total cost estimated at $33 million)
- Undertake additional technical & economic studies as required to assess emerging technologies (e.g. advances in gasification and other key technologies). The CCPC would have the resources to investigate those processes and determine if they were of interest for further work.
- Monitor technology developments worldwide.
- Seek participatory role in national & international clean coal projects e.g. the CO_2 "Backbone" project, FutureGen, CoalFleet, IEA, etc.
- Promote educational opportunities.

There is great national interest in climate change and carbon sequestration. The future of coal for electrical generation is dependant on demonstrating either IGCC or advanced supercritical

pulverized coal (PC) with carbon capture capabilities. The CCPC Phase III will greatly enhance the knowledge of gasification, advanced combustion and carbon capture technologies. Also the identification of effective retrofit technology for CO_2 capture and identifying possible CO_2 sinks for existing plants will benefit the North Dakota lignite industry in a possible future CO_2 controlled environment. Fort Union lignite, common to both Saskatchewan and North Dakota, has similar characteristics, so the knowledge gained by the CCPC project would be useful to both organizations.

PROJECT DESCRIPTION

Specifically, the CCPC Phase III work plan will comprise of four major areas:

I. Technology Gap Closing Activities

Phase II identified a technology gap in gasification technologies using low-rank coal as feeds. A major part of the work plan of Phase III will be focused on this issue. The work is scheduled to be carried out over the duration of the project activity. Deliverables will be via reports detailing the processes studied and performance expected using Alberta sub-bituminous and Saskatchewan Lignite coals as feedstocks in IGCC projects using the technologies. This will be done in two areas:

A. Assessing Technology Improvements.

Several feasibility studies will be initiated to evaluate developments in gasification processes. Both ConocoPhillips and Siemens Fuel Gasification Technology (formerly Future Energy) are undergoing significant changes both technically and commercially. The impacts of these on plans to use western low-rank coals will be evaluated. Also, since the well-proven Texaco gasification technology was acquired by GE in 2004, GE has not been willing to consider applications with low rank coal. It is anticipated that once current work on bituminous coal design is completed GE will turn their attention to lower rank coals. Other leading technologies will be monitored for developments which might assist in the use of low-rank coal.

Approach

Leading gasification developers will be approached for details on their plans in relation to low-rank coals. If significant progress has been made or if the developer's plans are

sufficiently well advanced, studies will be initiated to assess the impact of proposed technology enhancements on the overall performance and economics of IGCC projects using the gasification technologies. Studies undertaken during Phase I & II will be used to provide a baseline for comparison. This work will be done by contract either by consultant or directly with the developer.

The work of selecting which processes should be evaluated will begin soon after project start and will be done by the Technical Committee. Depending on progress made by developers, contracts will be awarded at appropriate points.

B. Evaluating New or Emerging Technologies.

This task is intended to uncover important new technologies which will enhance the potential for gasification to be applied economically to low-rank Western Canadian feedstocks. Various new or emerging gasification technologies which are not sufficiently advanced to have been included in earlier CCPC work are being developed.

Examples include the Pratt & Whitney compact entrained flow gasifier, which promises significantly reduced capital costs, the KBR transport reactor, which is a simplified air-blown reactor based on cat-cracker technology and the Centre Point Energy process for the manufacture of Substitute Natural Gas. This last process uses a catalytic gasification process, an area not yet commercially proven, to convert coal directly in a single step to methane without the need for a separate methanation reactor. Other key process improvements such as air separation by ceramic membranes are also of interest in this task.

Approach

The Technical Committee will provide the ideas on which technologies might be looked at using input from conference proceedings and other sources. Several studies will be carried out to evaluate these technologies, either by consultant or directly by the developer.

As in the previous task, the work of selecting which processes should be evaluated will begin soon after project start and will be done by the Technical Committee. Depending on progress made by developers, contracts will be awarded at appropriate points.

II. Evaluation/Participation in National & International Clean Coal Activities

Opportunities exist for Canada to participate in international projects such as the US Department of Energy (DOE) led FutureGen project or for industry to take part in EPRI's Coal Fleet gasification activities. Other international projects are being undertaken in Europe. CCPC is best placed to coordinate such activities for the benefit of industry and will actively seek opportunities for participation.

CCPC is also expected to be able to participate in the spin-off projects resulting from earlier CCPC work, described below, by EPCOR, SaskPower and Sherritt Coal. Through agreement with the CCPC, members may be involved in Advisory Committees for each project or attend information sessions as the projects develop. CCPC will coordinate activities with the sponsors of these projects to ensure that the information can be shared with the participants at minimal cost and inconvenience to the sponsors.

Sherritt Coal has been separately reviewing the potential to gasify coal to produce hydrogen for the production of fertilizers at their Fort Saskatchewan facility. To this end they evaluated

the gasification characteristics of western Canadian coals and undertook gasification tests on the Future Energy pilot plant in Germany. They also evaluated coal upgrading as a means of improving the coal characteristics for gasification. They are now evaluating the design and construction of a 100 t/d pilot plant at Fort Saskatchewan.

The CCPC and EPCOR are proceeding with a Front End Engineering Design (FEED) study for a 400 MW IGCC plant with CO_2 capture at Genesee. This will provide much needed information on the cost of a plant at a level of detail not previously achieved. This will enable the industry to determine the costs of this technology relative to a conventional Advanced SuperCritical design such as that used for Genesee 3.

~ SaskPower is proceeding with a FEED study of a 300 MW advanced supercritical pulverized coal plant using lignite as a fuel. Previous CCPC studies had indicated that gasification would be too expensive given the state of development of gasification processes using lignite as a feed. Both amine scrubbing (figure two, page 13) and CO_2/Oxygen Combustion (figure 3, page 14) will be examined as a CO2 capture option. Following completion of the FEED study (expected in mid-2007) and assuming the project meets economic hurdles, the project will move to detailed design and construction.

Approach

The CCPC will first investigate clean coal activities which are planned or in progress nationally and internationally. This work will be carried out by consultants. A list of projects or other activities will be prepared and reviewed by the Technical Committee. These will be reviewed for relevancy to Canadian interests and a short list of the most beneficial project prepared. CCPC will initiate discussions with the sponsors of the selected projects and other clean coal activities to determine the conditions under which Canadian participation might

be entertained. From this, the best candidate projects will be selected for participation. Costs associated with participation in these projects are not included in this application. It is anticipated that agreements with the CCPC spin-off project sponsors will be separately made and that the coordination role will be carried out by the Technical Committee.

III. Information and Database Development.

Many studies have been carried out during Phases I & II of the CCPC project. It has become apparent that it would be extremely useful to develop a database to provide a high level summary of the key information on the studies carried out by the CCPC to date. It is anticipated that this database will provide key input data and the results – performance, environmental impacts, and costs. The database will provide limited modeling capability to allow different plant sizes and plant feedstocks to be evaluated. Additional materials (presentations etc.) explaining the technology of Clean Coal will also be prepared for stakeholders.

Approach

This task will be carried out by a consultant. A request for proposal will be prepared describing the scope of work and bids will be solicited. The scope, schedule and key milestones and deliverables will be finalized and contract awarded.

IV. Program Administration

This Task includes all the items such as project management, legal, accounting, meeting costs etc. required to administer the project.

Approach

Administration will be carried out by the Executive Director with help from specialized consultants such as accountants, legal support etc.

Figure 1:

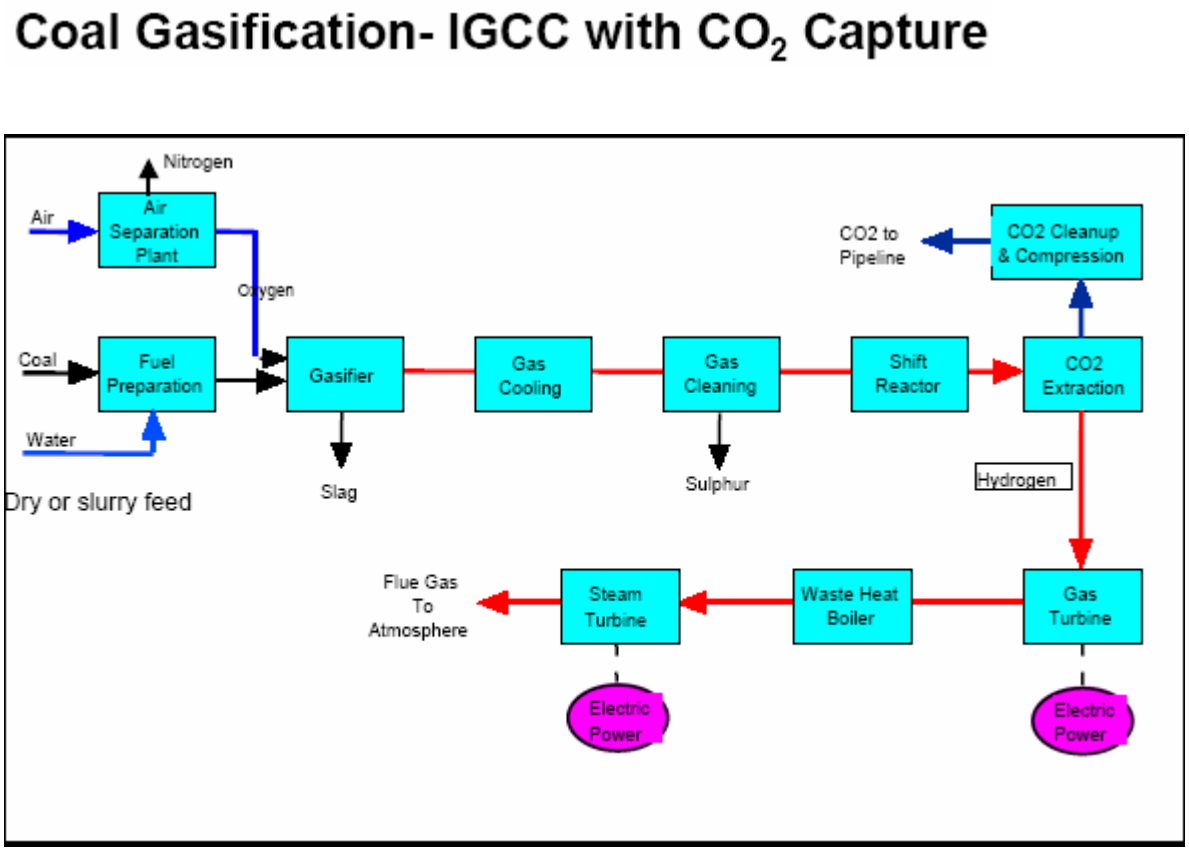


Figure 2:

Flue Gas Amine Scrubbing

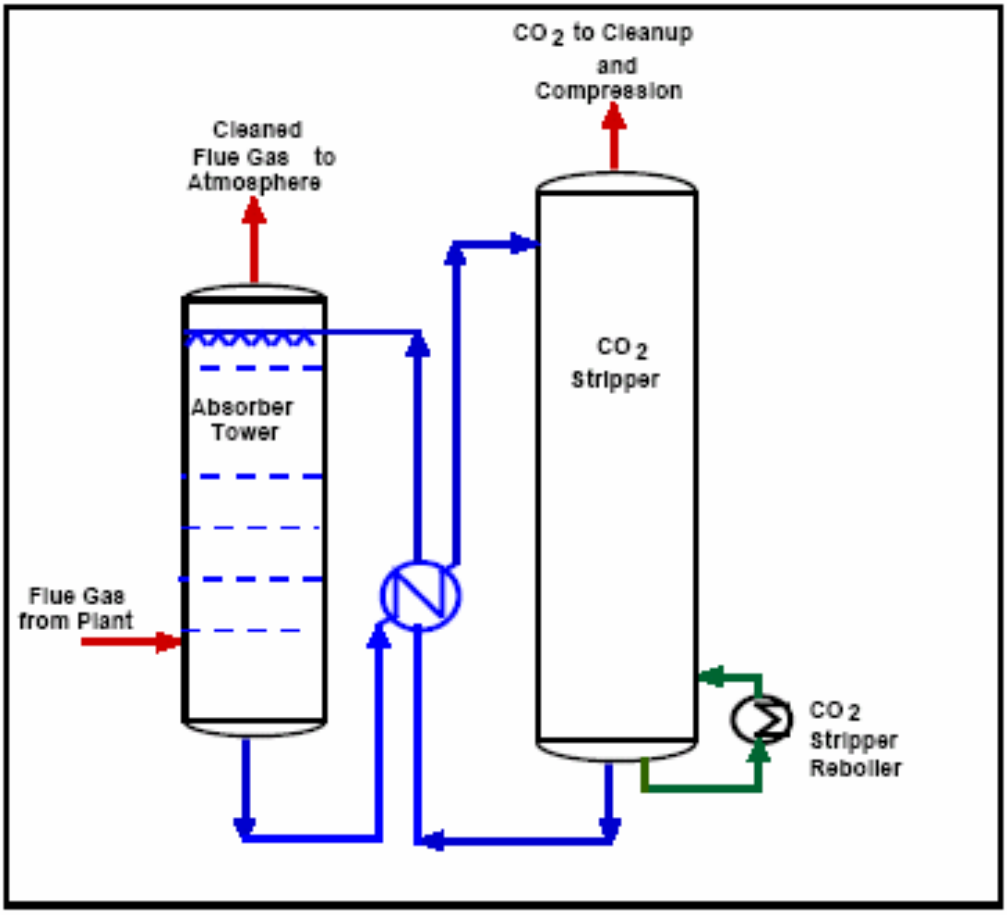
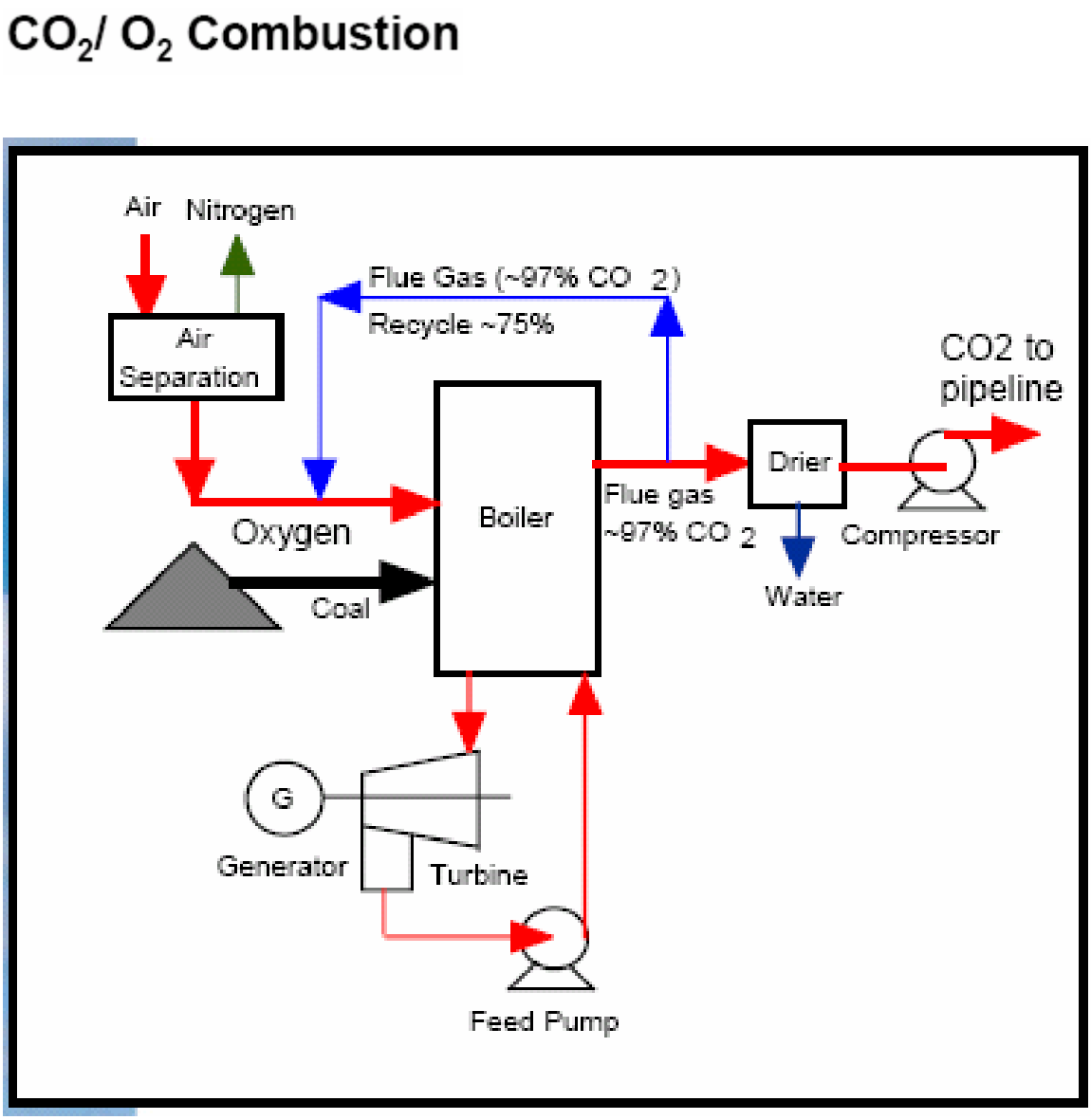


Figure 3:


CO_2/ O_2 Combustion
Air
Nitrogen
Air Separation
Flue Gas (~97% CO 2)
Recycle ~75%
CO2 to pipeline
Drier
Boiler
Flue gas ~97% CO 2
Compressor
Oxygen
Coal
Water
G
Generator
Turbine
Feed Pump

STANDARDS OF SUCCESS

The overall success of the CCPC program will be determined through the successful implementation of one or more Phase III first-of-a-kind commercial scale plants in Canada that demonstrates an advanced clean coal technology power generation plant (e.g. IGCC, advanced supercritical pulverized coal (PC)) capable of CO_2 capture. A major technology challenge is to maintain the ability of the plant design to operate at high availability to ensure economic viability and carbon capture ability at reason costs and minimal efficiency losses at the plant.

IGCC is not yet a viable option for low rank coals. Neither IGCC nor supercritical PC plants have demonstrated carbon capture and sequestration. The CCPC Phase III Program is fortunate to access two front end engineering and design studies that are underway for both an IGCC and an advanced supercritical pulverized coal plant with oxyfuel combustion using low rank coal and capturing carbon. In addition, the success of the CCPC program will be the identification of an efficient, effective retrofit technologies that can address CO_2 removal from existing plants and identifying possible CO_2 sinks that will also benefit the North Dakota lignite industry by providing an option for continued operations of existing facilities if regulation or legislation mandate CO_2 control.

The overall success requires identifying appropriate candidate opportunities and cooperative participation of the lignite industry operators and producers to address and solve technical, economic and regulatory concerns. Communications among the program participants will be essential.

BACKGROUND

History of the CCPC

The CCPC project was initiated in 2001 to accelerate the development and demonstration of clean coal technology in Canada. A multistage plan was prepared with the goal of building a demonstration plant using new generation technology 2011 to 2015 time frame. Key stages of the project are:

Phase I: Feasibility Studies, Jul 2001 – Jul 2003

Phase II: Optimization Studies and Business Case development, Dec 2003 – Dec 2006

Phase III: Demonstration Plant design, 2005 to 2007 and 2006 to 2009

Phase IV: Demonstration Plant construction, 2005 to 2011 and 2009 to 2014

Phase V: Demonstration Plant operation, start 2012 & 2015

Phase I

The $5 million Phase I work commenced in mid-2001 and was completed in July 2003. These studies provided a consistent basis of cost evaluation of the options for the production of clean electricity with CO_2 capture. The results of the studies showed that:

- Technology is commercially available to control conventional air emission (NOx, SO_2, particulates, mercury) to levels approaching that of natural gas power generation. However, costs to do so were high, ranging from $250m - $350m for capital and resulting in additional operating costs ranging from $4/MWhr - $22/MWhr.
- Amine Case: Significant energy efficiencies of 20% were achieved with an improved process, and an additional 11% due to effective integration with the power plant. However, a competing process developed by MHI was not able to be evaluated.

- CO_2/O_2 Combustion: In spite of great efforts by the contractors in developing new designs, the high cost and performance penalties imposed by the large scale air separation required could not be overcome.
- Retrofit: Technologies were identified to control all non-CO_2 emissions, CO_2 removal options were compared, costs and performance were estimated. Amine scrubbing was identified as likely to be the most appropriate retrofit technology.
- New: Gasification appeared to offer the best prospects for new plants by combining relatively simple processes to control conventional emissions with simple CO_2 capture processes. But not all gasification technologies could be studied, and it became apparent that for low-rank coals, considerable uncertainty exists in regard to costs and performance. Also, the most advanced SuperCritical Rankine cycle technology was not reviewed and cost reduction strategies such as simplification of the design was not able to be applied to the CO_2/O_2 Combustion option.

Phase II

The $2.8 million Phase II work started in December 2003 will be complete in the second quarter of 2007. Phase II of the CCPC provided the information that defined two site-specific demonstration projects (EPCOR, SaskPower) that are being carried forward. North Dakota Lignite Industry Members participated in Phase II.

The tasks carried out were:

- Phase I Technology Gap Analysis. This reviewed the Phase I reports and made recommendations to the CCPC Technical Committee on areas of the technology where more development effort is required.
- Gasification technology and feedstock evaluation. The focus on low-rank coal made this work unique. This work reviewed available gasification technologies, and potential

process improvements. In particular, processes such as ESTR which was not available for analysis in Phase I (the technology having been bought by ConocoPhillips) was included.

A detailed IGCC study was performed in 2005 and 2006 by Jacobs Consultancy that provided costs and performance information for plants “with” or “without” carbon capture. The study was based on the ConocoPhillips gasification technology for subbituminous coal and the Future Energy (Siemens) gasification technology for lignite coal. The study was done using Canadian costs, labor productivity and metric engineering units. Basin Electric and Minnesota Power are near completing the process to adjust the key conclusion to more typical Midwest U.S. values.

A major issue for the Jacobs Consultancy study was obtaining timely, quality information from the gasification and power island technology providers. Another challenge was determining how to attain the best performance and costs using Alberta subbituminous and Saskatchewan lignite as feedstocks.

A second phase to this study was recently completed by Jacob Consultancy. The base IGCC study was expanded to explore potential performance and economic opportunities through polygeneration (i.e. producing hydrogen with power production while capture CO_2).

- Amine Extraction Optimization. In the Phase I study, the Econamine (owned by Fluor) process for capturing the CO_2 was used as the basis. In Phase II (nearing completion) an optimization study was based on the Mitsubishi Heavy Industries (MHI) amine CO_2 removal process. Other participants in the Phase II study are Doosan Babcock Energy,

Alstom Power, Air Products and Neill & Gunter. State-of-the-art Advanced SuperCritical Rankine cycle technology being developed and used in Europe is also included. This uses higher temperature and pressure steam conditions to give greater efficiency from the power cycle.

- CO_2/Oxygen Combustion (Oxyfuel) Optimization. Concerns about the large parasitic energy requirements for air separation require that the competitive potential of this technology be validated. Three important issues were addressed. As in the gasification case with the H_2S, the benefits of leaving the SO_2 (all or in part), and possibly other flue gas constituents, in the extracted CO_2 and pipelining the gas mixture for use in Enhanced Oil Recovery (EOR) or to storage is being evaluated. Also, as in the amine case, data from state-of-the-art Advanced SuperCritical Rankine cycle technology being developed and used in Europe is included. Finally, performance, operational and economic impacts of deleting air-firing capability from the design was evaluated. This study is being done in conjunction with the Amine Study described above. Preliminary results will be available soon and the study will be concluded in the second quarter of 2007.

QUALIFICATIONS

Canadian Clean Power Coalition

The Canadian Clean Power Coalition's seven founding member companies represent over 90 percent of Canada's coal-based electrical generation capacity. Members of the CCPC include: ATCO Power, EPCOR, IEA Coal Research, IEA Greenhouse Gas, Luscar Ltd, SaskPower, Ontario Power Generation, TransAlta, and Nova Scotia Power. California-based Electric Power Reach Institute (EPRI) joined the coalition as a participant in Phase II.

The Government of Canada, through Natural Resources Canada, is a partner in the CCPC project. The Alberta government through the Alberta Energy Research Institute and the Saskatchewan government through the Saskatchewan Industry and Resources are members of the CCPC project. "Cutting-edge technology to burn coal cleanly is an important step in decreasing greenhouse gas emissions, as outlined in our Climate Change Plan for Canada," said the Honorable Herb Dhaliwal, Minister of Natural Resources Canada. "By finding a cleaner way to use economical and abundant sources of energy, we are contributing to a better quality of life for all Canadians through healthier communities and greater economic prosperity."

"By working together with the Government of Canada, the Canadian Clean Power Coalition is one step closer to making the first generation of clean coal technology a reality," said Jim Dinning, CCPC Chair. "Coal is our country's most abundant fossil fuel resource and an essential part of Canada's clean energy future.

Basin Electric Power Cooperative

Basin Electric Power Cooperative is a consumer-owned, regional cooperative headquartered in

Bismarck, North Dakota. Basin Electric owns electricity-generating power plants with a total capacity of 2750 megawatts. Basin Electric serves 120 rural electric member cooperative systems that in turn serve approximately 2.5 million consumers in the nine states of North Dakota, South Dakota, Montana, Wyoming, Minnesota, Nebraska, Iowa, Colorado and New Mexico.

Basin Electric has various subsidiaries, including Dakota Gasification Company, which produces natural gas from the coal gasification process and products such as chemicals and fertilizers; Dakota Coal Company purchases lignite coal for our power plants and owns a lime processing plant. Basin Electric and its subsidiaries employ about 2,000 people.

VALUE TO NORTH DAKOTA

The successful use of lignite in an IGCC or SuperCritical PC with carbon capture capabilities will benefit North Dakota lignite industry by demonstrating the technical and economic viability of lignite fuel in a high efficient power plant. The CCPC technology evaluations, combined with the current North Dakota activities (lignite upgrading projects, lignite gasification test in advanced Department of Energy (DOE) gasification facility, Plains CO_2 Reduction (PCOR) Partnership) could provide lignite-based options for new generation plants.

The high reactivity of the lignite provides a market advantage against other coals for IGCC technology, and the impact of high moisture is minimized. Clearly, this IGCC technology could provide lignite-based options for new generation plants. These coal gasification systems also offer the best potential competition to natural gas-based generation and the future vision of coal-based generation.

The success to the North Dakota lignite industry would be the integration of the CCPC information into the existing operations ranging from retrofit CO_2 capture for existing plants, sequestration and/or technical information supporting construction of an advanced IGCC or supercritical PC technology with CO_2 capture capabilities.

Identification of an efficient, effective retrofit technology that addresses CO_2 removal from existing plants and identifying possible CO_2 sinks will also benefit the North Dakota lignite industry by providing an option for continued operations federal regulation or legislation mandate CO_2 control. A substantial study of how North Dakota could use carbon dioxide for Enhanced Oil Recovery or Enhanced Coal Bed Methane Recovery would augment the state’s energy production potential.

MANAGEMENT

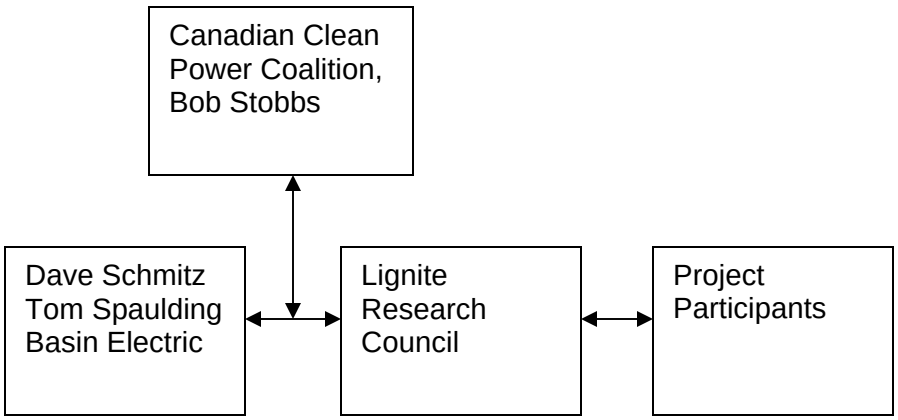
Dave Schmitz will coordinate the project. Mr. Schmitz is a registered Professional Engineer in the State of North Dakota with over 35 years of electric utility experience. He is the Project Manager of the NextGen Power Project for Basin Electric Power Cooperative and has extensive experience and knowledge of new plant development.

Additionally, Tom Spaulding will provide technical support for the project. Mr. Spaulding is a registered Professional Engineer in the State of North Dakota with over 15 years of electric utility experience. Mr. Spaulding has the responsibility for the technical review of projects related to the use of gasification and other advanced technologies for new coal and existing based generating plants.

Communication:

Communications are essential for a successful project. In an effort to accommodate project participants with planning, scheduling and facilitating discussion on the project the following communication flow will be followed.

Communications Flow:



TIMETABLE

The CCPC Phase III project is a continuation of CCPC's Phases I & II. The overall plan is shown below in the Gantt Chart which includes spin-off projects. The overall goal of Phase III is to continue to evaluate gasification technology for low-rank coals to provide an overall coordination role for clean coal development, particular in regard to the spin-off projects.

ACTIVITY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CCPC Phase I: Feasibility Studies											
CCPC Phase II: Optimization Studies											
CCPC Phase III: Technology Breakthough											
Technology											
Retrofit 0ptions											
First-of-a-kind Commercial Project Feedback / International Activities											
Assessing Technology Improvements											
Evaluating New or Emerging Technologies											
CO2 Transportation, Use & Storage (includes NS work)											
Communications											
Information and Database Development											
Website Updates											
Key Message Development for Stakeholders, Conferences, etc.											
Program Administration											
Spin-off Projects:											
EPCOR/CCPC IGCC FEED Study											
SaskPower Advanced SuperCritical Oxyfuel FEED Study											
SaskPower Advanced SuperCritical Oxyfuel Project											

BUDGET

The total cost of the Phase III work plan is currently $7.5 million (Canadian funds). Each industrial participant's share is $312,500 (Canadian funds) or ≅ $ 260,000 (U.S. funds) spread over 2006 - 2009.

CCPC PROJECT PHASE III

		GOVERNMENT FISCAL YEAR				CALENDAR YEAR				
		2006/07	2007/08	2008/09	2009/10	2006	2007	2008	2009	TOTAL
Cost per Year:		$1,153,846	$2,307,692	$2,307,692	$1,730,769	$576,923	$2,307,692	$2,307,692	$2,307,692	**$7,500,000**
Total Funding Breakdown										
Federal		$384,615	$769,231	$769,231	$576,923	$192,308	$769,231	$769,231	$769,231	**$2,500,000**
Provincial	Alberta	$384,615	$769,231	$769,231	$576,923	$192,308	$769,231	$769,231	$769,231	**$2,500,000**
	New Brunswick	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Ontario	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Sask.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	B.C.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Nova Scotia	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TOTAL:	$384,615	$769,231	$769,231	$576,923	$192,308	$769,231	$769,231	$769,231	**$2,500,000**
Industry	TBD	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	ND Lignite Devel.	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	EPCOR	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	EPRI	$24,038	$48,077	$48,077	$36,058	$12,019	$48,077	$48,077	$48,077	**$156,250**
	TBD	$24,038	$48,077	$48,077	$36,058	$12,019	$48,077	$48,077	$48,077	**$156,250**
	NSPower	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	SASKPOWER	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	TBD	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	TransAlta	$48,077	$96,154	$96,154	$72,115	$24,038	$96,154	$96,154	$96,154	**$312,500**
	TOTAL:	$384,615	$769,231	$769,231	$576,923	$192,308	$769,231	$769,231	$769,231	**$2,500,000**

MATCHING FUNDS

Total Project value is $260,000 (US funds). Basin Electric Power Cooperative and Lignite Industry members requests $130,000 from the North Dakota Industrial Commission Lignite Research & Development Program. The Lignite Industry Members would provide industrial matching cost share of $130,000 with written commitments following funding approval by the Industrial Commission. Matching funds commitment are subject to Board of Directors approval of the participating organizations (as required).

Lignite Industry Members interested in participation in CCPC's Phase III include:
Basin Electric Power Cooperative, Great River Energy, Dakota Gasification Company, Minnesota Power, Montana-Dakota Utilities, Westmoreland Properties, Otter Tail Power Company, and Great Northern Power Development

TAX LIABILITY

I, Clifton T. Hudgins, certify that Basin Electric Power Cooperative does not have any outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.

Shawn L. Quiss Acting CFO

Clifton T. Hudgins
Senior Vice President
Chief Financial Official

4/1/07

Date

CONFIDENTIAL INFORMATION

All data will be placed in the public domain as part of the CCPC's Phase III. The final report summarizing the project and its findings will be public information.

REFERENCES

1. From the Canadian Clean Power Coalition website:

   www.canadiancleanpowercoalition.com

2. Department of Energy Fossil Energy website:

   http://fossil.energy.gov

APPENDIX A

Resumes of key personnel

DAVID P. SCHMITZ, P.E.

Basin Electric Power Cooperative

1717 E. Interstate Avenue

Bismarck, N.D. 58503-0561

(701) 355-5701

dpschmitz@bepc.com

Qualifications

B.S., Mechanical Engineering, North Dakota State University

Registered Professional Engineer, North Dakota

Member of National Society of Professional Engineers

Over 32 years of electric utility experience

Professional Experience

December 2005-Present

Basin Electric Power Cooperative

Project Manager – NextGen Power Project

Manage the development, design and construction of a 500-700 MW new coal-based generation facility located on Basin Electric's east side interconnected transmission system. Project options include self building or including joint participants in the project. Advanced technologies including IGCC are being evaluated.

May 2001 to November 2005

Basin Electric Power Cooperative, Headquarters, Bismarck, ND

Vice President, Engineering & Construction

Manage and direct the Engineering & Construction Division to continue providing a broad range of design engineering, technical, construction coordination, capital projects planning and administration, facility life assessment, and economic evaluation support for existing generation, transmission and lime production facilities. Continue to administer existing and negotiate new microwave, fiber optic and mobile radio system agreements and licenses. Responsibilities also include direct and indirect support for planning, project coordination, engineering and construction of major new generation, transmission and telecommunications facilities.

October 1985 to April 2001

Basin Electric Power Cooperative, Headquarters, Bismarck, ND

Manager of Engineering

Responsible for combining and downsizing the previous Production Department engineering staff and the previous Engineering Department (responsible for transmission design, construction, and maintenance) engineering staff. Managed the new Engineering Division to provide a broad range of design engineering, technical, operational performance, construction coordination, capital projects planning and administration, facility life assessment, and economic evaluation support for essentially all areas of the Cooperative. This included varying levels of involvement with DGC starting with its acquisition. It also included negotiation and administration of the microwave and mobile radio system agreements and licenses.

October 1978 to September 1985

Basin Electric Power Cooperative, Headquarters, Bismarck, ND

Manager of Design

Managed and supervised the new Design Division with responsibilities for overseeing and directing design engineering projects for new generation projects and modifications to existing generation facilities. This included the remaining project coordinator duties for LRS and also picked up project coordinator responsibilities for the remainder of the 900 MW Antelope Valley Station project until its completion.

June 1977 to September 1978

Basin Electric Power Cooperative, Headquarters, Bismarck, ND

Project Coordinator – LRS

Responsible for supervising project engineering staff and for coordinating, monitoring, and guiding all day-to-day activities of internal departments/divisions, consultants, and other parties involved in the design and construction of the Laramie River Station and the Grayrocks Dam.

October 1975 to May 1977

Basin Electric Power Cooperative, Headquarters, Bismarck, ND

Project Engineer – LRS

Worked as a project design engineer on the 1650 MW Missouri Basin Power Project. This involved working with engineering consultants Burns & McDonnell on design of the Laramie River Station and Banner Associates on design of the Grayrocks Dam. It also involved working with REA (now RUS) for contract specifications and administration.

March 1974 to September 1975

Basin Electric Power Cooperative, Leland Olds Station, Stanton, ND

Results Engineer

Responsible for monitoring and guiding overall plant performance, supervising plant engineering staff, and supervision of the instrument maintenance group, the water & coal lab technicians, and the coal handling crew.

February 1972 to February 1974

Basin Electric Power Cooperative, Leland Olds Station, Stanton, ND

Mechanical Engineer

Conducted tests, monitored plant performance and designed smaller plant modifications

Professional Memberships, Certifications, Organizations

Registered Professional Engineer, North Dakota

National Society of Professional Engineers

TOM SPAULDING

Basin Electric Power Cooperative

1717 E. Interstate Avenue

Bismarck, N.D. 58503-0561

(701) 355-5716

tspaulding@bepc.com

Qualifications

B.S., Mechanical Engineering, North Dakota State University

15 years chemicals/plastics industry experience and 2 years gasification/electrical utility experience

Professional Experience

May 2006 to present

Basin Electric Power Cooperative, Headquarters Office, Bismarck, ND

Mechanical Engineer III

A participant in various project development stages for NextGen Power Project that utilizes GE IGCC entrained-flow technology. Currently duties include involvement with the Transport Reactor Integrated Gasification (TRIG) testing project at the Power System Development Facility (PSDF) in Wilsonville, Al. Member of the CO_2/GHG Work Group commissioned to access emerging technologies and applications to control carbon dioxide and other green house gases from Basin Electric facilities.

January 2005 to May 2006

Dakota Gasification Company, Beulah, ND

Mechanical Engineer IV

Provide engineering support to meet plant operating, environmental and safety performance objectives. Typical responsibilities included: 1) defining job scopes, 2) prepare estimates, 3) prepare/evaluate bid proposals, 4) prepare equipment specifications, 5) perform preliminary/final designs and 6) prepare design packages for submittal.

September 1995 to January 2005

Chevron Phillips Chemical Company, Borger/Houston, TX

Team Leader/Production Engineer

Responsibilities included various operating aspects, including production, product quality, environmental and safety performance. Typical responsibilities included: 1) preparing daily operating instructions, 2) preparing month end financial/production reports, 3) initiating/overseeing maintenance activities, 4) providing technical/troubleshooting support and work direction, 5) initiating/implementing improvement projects, 6) preparing annual operating budget forecasts and 7) investigating quality/environmental/operating excursions.

October 1989 to September 1995

Phillips Petroleum Company, Borger TX

Plant-Design Engineer

Provide engineering support to meet plant operating, environmental and safety performance objectives. Managed Capital Budget Projects from inception through completion phases.

Summary of typical design related activities included: 1) Develop scope/establish premises, 2) preliminary design, 3) conduct Process Hazards Analysis, 4) prepare equipment specifications, 5) prepare/submit/evaluate bid packages, 6) prepare cost estimate, 7) prepare economic analysis & safety justification for capital funds approval, 8) final design, 9) equipment/material procurement, 10) oversee construction activities and 11) conduct Pre Start-Up Safety Review (PSM requirement).

Robert A. Stobbs, P. Eng.

SaskPower

2901 Powerhouse Drive

Regina, Sask. S4N 0A1

Tel: (306) 566-3326

Qualifications

B.S., Chemical Engineering, University of Saskatchewan

Professional Experience

2004 to present

Canadian Clean Power Coalition, Regina, Saskatchewan

Executive Director

Seconded from SaskPower to the Canadian Clean Power Coalition (CCPC) to manage the second phase of feasibility studies on clean coal technologies. Responsible for all activities to implement the approved work plan within prescribed budget and schedule. Negotiate and execute contracts with engineering firms for the required studies.

2001 to 2003

SaskPower, Regina, Saskatchewan

Project Leader, Operations Support

Coordinated the environmental issues and clean coal activities for the Power Production Business Unit. Corporation Representative on several committees and groups that were developing and promoting clean coal technologies.

1999 to 2000

SaskPower, Regina, Saskatchewan

Project Leader, Power Production Business Unit

Coordinated the data conversion and creation activities within Power Production to meet the requirements of the Delta Project. Provided direction and training to staff in five locations to ensure the data converted and created met the requirements of SAP.

1998

SaskPower, Regina, Saskatchewan

Team Leader, Process and System Integrity, Delta Project

Developed the business process design to ensure adequate risk-based controls were integrated into the new business processes. Developed the policies and procedures necessary to maintain authorized access and set the appropriate parameters to reflect the Corporation’s risk assessment.

1995 to 1998

SaskPower, Regina, Saskatchewan

Senior Auditor, Internal Audit

Conducted programs of operational audits to improve the competitiveness of the Corporation's business units by reviewing business processes from the perspective of economy, efficiency, effectiveness and control. Administered corporate environmental audit program.

1996 to 1997

SaskPower International, Regina, Saskatchewan and Zelenodolsk, Ukraine

Technical Specialist

Specialist for chemical and environmental issues on a CIDA technical assistance project in southeastern Ukraine. The project required the rehabilitation of three units of a ten unit power station. The scope of work was to provide guidance to the plant staff on project management techniques and the preparation of technical specifications. These specifications were necessary for bidding in the international market to meet the requirements for World Bank funding.

1994 to 1995

SaskPower, Regina, Saskatchewan

Member of Business Unit Implementation Phase 1 Team which reviewed the Corporation for reengineering opportunities. Subsequently, team leader of the Capital/Project Management team on Phase 2 of the Business Unit Implementation which developed recommendations for reducing the current level of capital expenditures, establishing a ranking criteria for capital projects and restructuring engineering and support to match the capital program.

1992 to 1994

1981 to 1992

1994 to 1995

Environment Canada, Ottawa, Ontario

Senior Advisor, Greenhouse Gas Program

Administered consulting contracts for studies related to the objectives of the Greenhouse Gas Program - to develop and maintain comprehensive inventories of greenhouse gas emissions and, in partnerships with stakeholders, to assess actions to reduce greenhouse gas emissions.

SaskPower, Regina, Saskatchewan

Chemical & Environmental Engineer

Reporting to the Director of Generation Engineering, designed and developed cost estimates of chemical and environmental related systems for new generating projects and power station improvements, developed engineering standards for these systems and ensured environmental controls were incorporated in the design of major capital projects.

In particular, managed the design of the zero discharge water and waste water treatment facilities for the Shand project, implemented environmental monitoring for the Shand project; managed corrosion investigation and implemented surface and ground water quality monitoring programs for the Nipawin Hydroelectric Project.

1984

Project Manager, Meadow Lake Gas Turbine Project

Managed and controlled the cost, schedule, public information and interfaces between participating divisions.

1986 to 1988

1979 to 1981

Project Manager, Boundary Dam Supplementary Water Supply Project

Managed and controlled the cost, schedule, public liaison and overall coordination of the project.

1977 to 1979

SaskPower, Regina, Saskatchewan

Chemical Engineer

Reported to the Project Manager of the Poplar River Project, managed the design of the condensate polishing plant and stack gas monitoring system, and implemented surface and ground water quality monitoring programs for the project.

Whiteshell Nuclear Research Establishment, Atomic Energy of Canada Limited

Pinawa, Manitoba

Reactor Operations Engineer

Assisted in supervision of daily operation of an organic cooled nuclear reactor. Conducted daily checks of safety control devices, issued work permits for maintenance work and studied the various systems of the nuclear plant which led to check-out in operation of the reactor.

1973 to 1977

SaskPower, Regina, Saskatchewan

Environmental Surveillance Engineer

Conducted environmental surveys of operating power plants, including pollutant emissions from stacks, ambient ground level concentrations of air quality, and water quality sampling and analysis; prepared progress reports of environmental studies on power stations; prepared calculations of pollutant emissions and ground level concentrations for future power generating projects.

Professional memberships

Association of Professional Engineers & Geoscientists of Saskatchewan

National Association of Corrosion Engineers

Air and Waste Management Association

Technical committees

1979 – 1990

Environmental Requirements Subsection, Thermal and Nuclear Power Section, Canadian Electrical Association

1982 - 1986

Advisory Panel on Flue Gas Desulphurization, Canadian Electrical Association

1986 – 1987

Chairman of Flue Gas Emission Control Advisory Panel, Canadian Electrical Association

2001 to present

Chair, Technical Committee of the Canadian Clean Power Coalition