

**ALASKA STATE LEGISLATURE  
JOINT MEETING  
HOUSE SPECIAL COMMITTEE ON ENERGY  
SENATE SPECIAL COMMITTEE ON ENERGY**

March 24, 2009

3:11 p.m.

**MEMBERS PRESENT**

HOUSE SPECIAL COMMITTEE ON ENERGY

Representative Charisse Millett, Co-Chair  
Representative Nancy Dahlstrom  
Representative Kyle Johansen  
Representative Jay Ramras  
Representative Chris Tuck

SENATE SPECIAL COMMITTEE ON ENERGY

**MEMBERS ABSENT**

HOUSE SPECIAL COMMITTEE ON ENERGY

Representative Bryce Edgmon, Co-Chair  
Representative Pete Petersen

SENATE SPECIAL COMMITTEE ON ENERGY

Senator Lesil McGuire, Chair  
Senator Lyman Hoffman  
Senator Albert Kookesh  
Senator Bert Stedman  
Senator Bill Wielechowski

**COMMITTEE CALENDAR**

Overview: The Alaska coal industry, by Steve Denton, Usibelli Coal Mine, Inc.

- HEARD

**PREVIOUS COMMITTEE ACTION**

No previous action to report

**WITNESS REGISTER**

STEVE DENTON, Vice President  
Business Development  
Usibelli Coal Mine, Inc.  
Healy, Alaska

**POSITION STATEMENT:** Gave a PowerPoint presentation on Alaska's coal industry.

#### **ACTION NARRATIVE**

**CO-CHAIR CHARISSE MILLETT** called the joint meeting of the House and Senate Special Committees on Energy to order at 3:11 p.m. Present at the call to order were Representatives Tuck, Dahlstrom, Ramras, Johansen, and Millett.

OVERVIEW; THE ALASKA COAL INDUSTRY, BY STEVE DENTON, USIBELLI COAL MINE, INC.

CO-CHAIR MILLETT announced that the first order of business would be an overview of the Alaska coal industry by Steve Denton, Usibelli Coal Mine, Inc.

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STEVE DENTON, Vice President of Business Development, Usibelli Coal Mine, Inc., began a PowerPoint presentation with an explanation of the fundamentals of the development of coal. Slide 2 showed the three basic forces that turn vegetation into coal: time, pressure, and heat. Typically, burial first turns the vegetation into peat; in fact, coal from the Healy area was buried in excess of 4,000 feet. Most of Alaska's coal is about 20 million years old and is very young compared to anthracite in Pennsylvania that is 300 million years old. Slide 3 indicated that of the total fossil fuel resources in Alaska, discovered and undiscovered oil resources are 6 percent; discovered and undiscovered gas resources are 3 percent; and identified resources of coal are 91 percent. He pointed out that on the North Slope, identified sources of coal total 136 billion tons, and hypothetical resources of coal total 3.6 trillion tons.

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MR. DENTON, in response to a question from Representative Dahlstrom, gave the proper pronunciation of bituminous, sub-bituminous, and lignite. Slide 3 also indicated the location of coal fields throughout Alaska. Slide 4 listed five Alaska coal deposits with export potential: Nenana, Wishbone Hill, Cook

Inlet, Deadfall Syncline, and Bering River. He noted that Deadfall Syncline is particularly rich in high quality coal. Coal transportation starts at the mine where the coal is processed, stockpiled, and then loaded on the Alaska Railroad railcars. All of the Usibelli coal is transported on the railroad and there are limitations to railroad service caused by severe grades and summer traffic congestion. Slide 5 was a photo of the Seward Coal Terminal where the coal is stacked after its delivery by train, and before being transported onto ships.

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REPRESENTATIVE TUCK asked about the function of the conveyor.

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MR. DENTON explained that there are 10 conveyors that carry the coal to a "tripper" that then takes the coal off of the conveyor belt and moves it to the stacking conveyor. The coal is then transported onto the ships in layers.

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MR. DENTON presented slide 6 that listed information on the Seward Coal Terminal: the Usibelli coal mine safely moves 1.5 million tons per year through the terminal; the terminal is owned by the Alaska Railroad Corporation; and the terminal is operated by Aurora Energy Services, LLC, an affiliate of Usibelli Coal Mine, Inc. The other bulk material port is located at Port MacKenzie; however, there is no railroad service there. Port MacKenzie has the potential of servicing coal from Wishbone Hill, although the coal would be hauled to the port by truck. The port can accept vessels equal in size to the Seward terminal, but the season is limited by ice in the inlet. He opined Port MacKenzie would not replace the Seward terminal, but could serve as an additional port to handle an increase in coal exports. Mr. Denton informed the committee that the 2008 consumption of coal in Alaska was about 960,000 tons out of 1.54 million tons produced. He presented slide 8 and pointed out "how nice the sky looks in Fairbanks." This is because there are no plumes coming from smokestacks burning coal in any of the buildings in downtown Fairbanks. He explained that coal in Alaska is primarily used for co-generation. Co-generation produces electricity and heat that is piped by steam or hot water to nearby buildings. This is a very efficient system, improves the air quality, and provides very low cost space

heating. Co-generation is underused in the U.S., but is commonly used in Europe and Russia, and is a very environmentally effective and efficient means of providing heat. Aurora Energy, the University of Alaska, and three military bases utilize co-generation units. Another use for coal in Alaska is mine mouth generation. Mine mount generation will begin again at the Golden Valley Electrical Association Healy No. 1 (Unit 1) and Healy Clean Coal Project (HCCP), if HCCP returns to operation. He pointed out that Unit 1 was running at full load at the time the picture was taken and there was no smoke from the smokestack. He said the biggest advantage to mine mouth generation is the use of waste coal that preserves resources at a low cost.

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MR. DENTON displayed slide 9 that was a graph indicating the effect of coal generation on the price of electricity in the U.S. during 2004. It showed that more coal utilized in the total power system lowered the average retail rates to consumers. Alaska's generation mix statewide is about 10 percent coal, about 75 percent oil and gas, and about 15 percent hydroelectric. Slide 10 indicated 2007 North American production of coal was 1,234 million short tons. Production for the same year by Asia and Oceania totaled 4,069 million short tons. Mr. Denton said the Pacific Rim is the export market for Alaskan coal. The largest Pacific Rim importer was Japan with imports of 207 million short tons. Pacific Rim coal exporters were listed on slide 11; the largest competitors to North America were Australia and Indonesia. Slide 11 showed the estimated Usibelli coal exports booked for 2009 to be 770,000 metric tons.

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MR. DENTON, in response to Representative Johansen, explained that a metric ton is 10 percent more than a short ton: 2,205 pounds in a metric ton and 2,000 pounds in a short ton. He then turned to the subject of clean coal and said that he agreed with those who say there is no such thing as clean coal. As a matter of fact, there is no such thing as clean fossil fuel, and even natural gas as it comes from the ground "is some pretty nasty stuff." Therefore, coal, as a crude fuel with no refining, is difficult to burn cleanly; however, there is now technology to refine oil, gas, and coal. Slide 13 listed the pollution control factors of clean coal technology: strategies; pollutants; and green house gases. Clean Coal technology (CCT)

strategies include the pre-combustion strategies of washing and selective mining; for example, the removal of the top eight feet of the coal seam that is high in ash and sulfur. The resulting waste coal will be utilized in the future by a plant equipped with the technology to process coal of that nature. Washing the material will further remove sulfur and ash. Combustion technologies use the actual combustion to control pollutants such as particulate and nitrogen oxides (NOX). Mr. Denton stated that the HCCP uses the following approaches to address particulate and NOX: low NOX burners; a slagging combustor to make slag at a very high temperature; staged combustion to control the rate of combustion; and fluid bed combustion. Post-combustion strategies remove pollutants from the gas stream. This "scrubbing" is commonly used to deal with all of the pollutants such as mercury and NOX.

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MR. DENTON described the final CCT strategies for the gasification of coal. The primary reason for gasification is to provide the opportunity to control all pollutants to nearly 100 percent removal, which is possible with today's technology. In addition, gasification is the potential path to carbon capture. Finally, gasification provides the ability to make power generation, chemicals, fertilizer, and fuels. The basic gasification process is: organic material, plus water, plus some oxygen, and heat. The result is heat, carbon monoxide (CO), hydrogen (H<sub>2</sub>), ash, and pollutants. Slide 16 illustrated a cut-away view of a gasification reactor. The desired product is a relatively pure carbon monoxide and hydrogen stream called synthesis gas (syngas). He advised thousands of products can be made from syngas such as power generation, hydrogen, and chemicals. Furthermore, in Alaska, the use of Fischer-Tropsch (F-T) fuel has been tested in vehicles at Denali National Park, the Fairbanks North Star Borough, and the University of Fairbanks; in fact, the military has confirmed there is a use for F-T fuel in jet aircraft due to its excellent thermal stability.

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REPRESENTATIVE TUCK spoke about the possibility of converting the HCCP plant to a gas plant that would provide gas through coal. He asked, "What would be the difference as far as economy, transportation, and conversion, and the amount of energy it would take to change that to gas?... Not very efficient at all?..."

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MR. DENTON said no. He further explained that coal can be turned into natural gas and methane. In fact, the HCCP combustors are gasifiers, but only about one-half of the fuel is burned and the rest is gas going into the boiler where the combustion is completed. This is the process to control the NOX. If the plant were fired with oxygen instead of air, it would produce syngas.

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REPRESENTATIVE TUCK surmised that the most common use anticipated now is airplane fuel.

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MR. DENTON opined that the most common use is for petrochemicals.

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REPRESENTATIVE TUCK observed if you want to heat a home, it is best to "generate electricity out of it, cost effective wise, using coal, than it would be to use the gasification process."

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MR. DENTON agreed. However, the most cost effective use depends on the location; for example, if a consumer lived on the Yukon River, it would be more cost effective to convert the coal to liquid fuel and save on transportation costs.

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REPRESENTATIVE RAMRAS asked Mr. Denton to relay his observations from the Synthetic Fuels Industry Summit in Anchorage.

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MR. DENTON stated the military wants to see 50 percent of its jet fuel in Alaska to be F-T fuel by 2012. He opined the military may be asking for proposals to see "what the industry comes back with," and expressed his belief that [the military] will follow through with the process.

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REPRESENTATIVE RAMRAS recalled experimental gas-to-liquids projects around the state. Furthermore, the Alaska Energy Authority is looking at 77 demonstration projects. He asked whether a small coal-to-liquids demonstration project can be done at a reasonable cost.

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MR. DENTON said yes. He then opined that the coal-to-gasification and -liquids fledgling industry is about to experience a shift from mega-projects and their problems of scalability. He said he is now receiving inquiries about plants that would produce on a smaller scale.

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REPRESENTATIVE RAMRAS further asked how to overcome anxiety about coal and carbon sequestration at the federal level.

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MR. DENTON answered that certain areas of the state accept coal "relatively painlessly." For example, after gasification, if there is a pure CO<sub>2</sub> and water vapor stream, the CO<sub>2</sub> can be separated out fairly easily and the water vapor condensed out of the CO<sub>2</sub>. On the North Slope and in Cook Inlet there are spent reservoirs to use for disposal of the CO<sub>2</sub>. However, in Fairbanks it is difficult to know what the sequestration resources are.

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REPRESENTATIVE RAMRAS observed the viability of this process may not be for the Fairbanks area because the CO<sub>2</sub> has nowhere to go.

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MR. DENTON agreed this could be a serious impediment.

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#### **ADJOURNMENT**

There was an at-ease called at 3:50 p.m. in order to prepare for the regular meeting of the House Special Committee on Energy.

[The regular meeting of the House Special Committee on Energy convened at 3:52 p.m.]