

## NORTH DAKOTA LEGISLATIVE MANAGEMENT

## Minutes of the

**TAXATION COMMITTEE**

Thursday, September 10, 2015  
Roughrider Room, State Capitol  
Bismarck, North Dakota

Senator Jessica Unruh, Chairman, called the meeting to order at 9:00 a.m.

**Members present:** Senators Jessica Unruh, Brad Bekkedahl, Dwight Cook, Jim Dotzenrod, David Hogue, Lonnie J. Laffen, Connie Triplett; Representatives Jason Dockter, Glen Froseth, Patrick R. Hatlestad, Craig Headland, Tom Kading, Jim Kasper, Jerry Kelsh, Alisa Mitskog

**Members absent:** Representatives Wesley R. Belter, Vicky Steiner, Marie Strinden

**Others present:** John Walstad, Legal Division Director, Legislative Council  
See [Appendix A](#) for additional persons present.

**It was moved by Representative Hatlestad, seconded by Representative Kasper, and carried on a voice vote that the minutes of the July 29, 2015, meeting be approved as distributed.**

**ENHANCED OIL AND GAS RECOVERY STUDY****Allam Cycle Project**

Chairman Unruh called on Mr. Jason Bohrer, President & CEO, Lignite Energy Council, for presentation of information pertaining to the Allam Cycle project and the Kemper County carbon dioxide (CO<sub>2</sub>) capture and storage project in Mississippi, and a brief overview of the Clean Power Plan. Mr. Bohrer said the Allam Cycle project represents a joint effort by multiple parties. He said 8 Rivers Capital, a private development group from North Carolina, owns the intellectual property rights for the Allam Cycle. He said the Allam Cycle is a process that turns lignite coal into a gasified product that is used to generate electricity. At current natural gas prices, he said, the cost of electricity produced using the Allam Cycle would be competitive with electricity produced using natural gas. He said investing in electricity produced using the Allam Cycle would provide long-term price stability for North Dakota. He said representatives from the Lignite Energy Council, the Energy and Environmental Research Center, and 8 Rivers Capital have met to discuss timelines related to implementation of the Allam Cycle. He said an appropriation was granted during the 2015 legislative session to provide funding for research on the Allam Cycle. He said, the funding will be awarded at the end of 2015. He said the study of the Allam Cycle is a multimillion dollar undertaking. He said the Lignite Energy Council anticipates submitting its proposal to the Lignite Research Council at the end of this year to hopefully get the project started in 2016. He said corrosion is one of the main obstacles encountered when trying to gasify lignite, compress it, and then use supercritical CO<sub>2</sub> as a working fluid. He said this is one of the first issues the Lignite Energy Council would seek to address.

In response to questions from Representative Kasper, Mr. Bohrer said if the Allam Cycle were used in North Dakota, it is more likely that new plants would be built rather than retrofitting existing plants. He said existing coal-fired plants would not lend themselves to being retrofitted because the materials used in a plant implementing the Allam Cycle are about 30 percent smaller than the materials used in a traditional coal-fired plant. He said by the time you finish retrofitting an existing plant, you may as well have just built a new one. He said the earliest a plant using the Allam Cycle could be up and running in North Dakota would be about 10 years from now. He said about one-third of the estimated load growth over the next 20 to 30 years could potentially be met with power generated using the Allam Cycle. He said plants using the Allam Cycle could use the same fuel source as existing coal-fired plants and be located at the same plant site because they are so compact. He said representatives from the Lignite Energy Council plan to followup on an existing project in Texas in June or July of 2016. He said the Allam Cycle project in Texas uses natural gas as the fuel source and is expected to be completed in late 2016. He said touring the Texas plant will allow the Lignite Energy Council to view how a full scale model of this technology operates, learn about the types of problems that may have been encountered throughout the implementation process, and examine how closely initial projections ended up matching actual results from this plant. He said the Lignite Energy Council would be able to provide the committee with an update following its tour of the Texas plant.

In response to a question from Senator Bekkedahl, Mr. Bohrer said CO<sub>2</sub> generally would not be moved from an existing plant to a plant using the Allam Cycle because CO<sub>2</sub> used in the Allam Cycle must be kept at a very high pressure. He said this is typically accomplished by using a closed loop system so it would be difficult to inject CO<sub>2</sub> from an outside source. He said it would be impractical to try to meld flue gas into the purified CO<sub>2</sub> steam used in an Allam Cycle project.

### **Kemper County Carbon Dioxide Capture and Storage Project**

Mr. Bohrer continued his presentation and provided information pertaining to the Kemper County CO<sub>2</sub> capture and storage project in Mississippi. He said the facility captures and stores CO<sub>2</sub> from coal that is combusted within the plant. He said the plant cost \$6 billion to construct, which was about \$3 billion over the initial budget estimates. He said the technology implemented in the plant is working as expected. He said the plant has been producing electricity using natural gas as a feedstock for almost a year. He said the plant will ultimately produce synthetic natural gas from lignite and use that gas as a fuel to power turbines to produce electricity. He said it is more appealing to convert lignite to synthetic natural gas, rather than just purchasing natural gas outright, because a plant operator can sign a 30 to 40 year contract for lignite at a known price that will fluctuate very little over the life of the contract. He said this type of plant, though expensive to develop at the outset, provides price certainty over the long term. He said the Kemper County plant should be running exclusively on lignite by February of 2016. He said the CO<sub>2</sub> produced from the plant will be captured and shipped to neighboring oil fields for use in enhanced oil recovery techniques.

In response to a question from Representative Kelsh, Mr. Bohrer said using the current price of natural gas a plant would increase its fuel costs by about 20 percent by purchasing lignite coal to convert to synthetic natural gas rather than just purchasing natural gas directly.

In response to a question from Representative Froseth, Mr. Bohrer said research is continuing to uncover better ways to sequester CO<sub>2</sub> underground. He said industry representatives have determined that approximately 90 to 95 percent of sequestered CO<sub>2</sub> will remain in place. He said the potential exists to store hundreds of millions of tons of CO<sub>2</sub> underground. He said not all of the CO<sub>2</sub> used in enhanced oil recovery techniques remains underground but a very large portion of the CO<sub>2</sub> stays in place.

In response to questions from Representative Kasper, Mr. Bohrer said CO<sub>2</sub> makes up less than 1 percent of the atmosphere. He said CO<sub>2</sub> has both physical and legal properties. He said the federal Environmental Protection Agency (EPA) has the ability to classify something is a pollutant even if it would not be defined as a pollutant in a traditional sense. He said while CO<sub>2</sub> does not cause the same harm to human health as arsenic or mercury would, the EPA has determined that CO<sub>2</sub> is a pollutant.

In response to questions from Senator Bekkedahl, Mr. Bohrer said the Kemper County project is essentially employing the same concepts as Dakota Gasification Company's Great Plains Synfuels Plant except on a much larger scale. He said the Kemper County plant also burns all of the synfuels it produces rather than marketing them for sale. He said all of the lignite used in the Kemper County facility is Mississippi feedstock. He said it would be possible to convert North Dakota's coal-fired plants to natural gas-fired plants. He said the main obstacle to using natural gas produced from oil production as a fuel source in North Dakota plants is the ability to transport the gas to the plants. He said while North Dakota may have a large volume of excess natural gas, the state lacks an adequate transportation network to deliver the gas for use in these plants.

### **Clean Power Plan**

Mr. Bohrer continued his presentation and provided an overview of the Clean Power Plan. He said when the proposed provisions of the Clean Power Plan were announced roughly a year ago, North Dakota appeared to have an achievable path to compliance. He said the proposed plan that applied to North Dakota entailed an 11 percent reduction in CO<sub>2</sub> emissions by 2030. He said the proposed percentage was calculated by taking into account the reductions the EPA thought North Dakota could achieve in its existing plants, the amount of renewable capacity the state had, and the state's ability to displace coal generation with natural gas generation. He said the proposed plan took the realities on the ground in each state into consideration. He said when the final rule was issued, North Dakota saw a drastic increase in the percentage reduction in CO<sub>2</sub> emissions the state was expected to achieve by 2030. He said under the final rule, the percentage reduction in CO<sub>2</sub> emissions in the state was expected to achieve jumped from 11 to 45 percent. He said there is no way North Dakota can achieve a 45 percent reduction in CO<sub>2</sub> emissions without closing power plants. He said it is simply a mathematical impossibility. He said the state would need to build an additional 6,000 megawatts of wind-powered generation to build up enough CO<sub>2</sub> credit to allow the state to continue to operate its coal-fired power plants. He said the dramatic increase from 11 to 45 percent resulted from the EPA aggregating North Dakota with the eastern states. He said the EPA made the assumption that North Dakota was essentially the same as states operating in the eastern region of the country based on North Dakota's access to natural gas and the performance of North Dakota's power plants. He said this comparison is

not accurate for many reasons. He said the eastern region operates bituminous-fired power plants while North Dakota operates lignite-fired power plants. He said power plants on the east coast are also older and less regulated so plant operators on the east coast have the opportunity to make more significant improvements. He said this aggregation results in a situation where an older plant on the east coast, with very few technological upgrades, can achieve a much greater percentage increase in its efficiency than a newer North Dakota plant that has already implemented upgrades. He said another reason for the increase is the provision in the final rule requiring any CO<sub>2</sub> emissions from a new power plant to be offset in an equal amount. He said this provision essentially eliminates the option of building new natural gas-fired power plants to meet load growth. He said this leads to a scenario where North Dakota can only meet increased load growth through the use of renewables. He said complying with the new regulations will ultimately cause immense harm to consumers.

In response to a question from Senator Laffen, Mr. Bohrer said it is clear the EPA did not prioritize the effect increased rates may have on consumers when developing the final rule. He said coal is the cheapest form of electricity and requiring North Dakota to move away from generating electricity using coal will result in increased rates.

In response to a question from Representative Kasper, Mr. Bohrer said both the Lignite Energy Council and individual industry representatives were present in Washington, D.C. when the rule was being discussed. He said the Lignite Energy Council spent several hours meeting with EPA and White House officials to explain the operation of North Dakota plants and offer potential solutions to reduce emissions. He said the submitted documents and comments do not appear to have been taken into account.

In response to a question from Representative Headland, Mr. Bohrer said he has not received any indication that North Dakota will take a similar stance as Indiana in refusing to comply with the federal regulations. He said it is more likely that North Dakota would attempt to challenge the rule as it applies to this state in a similar manner as regulations regarding regional haze were challenged. He said he feels the state has a strong legal argument against being aggregated with the eastern region.

In response to a question from Chairman Unruh, Mr. Bohrer said North Dakota will not receive a full credit for investments the state has made in wind energy over the last 10 years. He said the rule only takes into account renewables that were built within the last three years. He said anything installed before 2012 does not count towards the EPA's standard. He said many of the prime spots for wind generation have already been used and the state's wind capacity is already nearing the point where it could no longer be reliably incorporated into the grid. He said many of the steps North Dakota has already taken are of no benefit in regard to the EPA's final rule.

In response to a question from Senator Triplett, Mr. Bohrer said if North Dakota had been aggregated into the same region as Montana, North Dakota's 45 percent emission reduction rate would decrease by roughly 10 percent.

In response to questions from Representative Bekkedahl, Mr. Bohrer said the Lignite Energy Council spent hours discussing the differences in British Thermal Unit content for lignite versus bituminous coal with the EPA but these discussions do not appear to have been taken into account in the development of the final rule. He said the fact that North Dakota has some of the highest air quality standards also did not have any effect on the EPA's final rule. He said this fact actually appears to have worked against the state. He said the EPA essentially disregarded the billions of dollars North Dakota has already invested in air quality and plant efficiency. He said the final rule requires North Dakota to make the same percentage improvements as states in the eastern region that have not invested in prior improvements.

Chairman Unruh thanked Mr. Bohrer and said the committee will be receiving additional testimony on this topic at future meetings from a representative of the Health Department and potentially the Attorney General's office.

At the request of the committee, Mr. Bohrer provided supplemental written materials (Appendices [B](#), [C](#), [D](#), [E](#), and [E](#)) following his presentations.

### **Consultant Proposals**

Chairman Unruh said two proposals were submitted to the Legislative Council in response to the request for proposal (RFP). She said proposals were received from the Energy and Environmental Research Center and IHS Energy.

Chairman Unruh called on Legislative Council staff for presentation of a memorandum entitled [Enhanced Oil and Gas Recovery Study - Information Regarding the Request for Proposal and Proposal Responses](#). Legislative Council staff said the memorandum provides a brief overview of the information the committee is seeking in

response to the study directive provided in 2015 Senate Bill No. 2015. Legislative Council staff said the Legislative Council issued a RFP for consultant services on July 31, 2015. Legislative Council staff said as of the closing date of September 1, 2015, the Legislative Council received two proposals for consulting services from the parties referenced by Chairman Unruh. Legislative Council staff said the memorandum contains a summary of selected components of each of the consultants' proposals for the committee's review.

Chairman Unruh called on representatives of IHS Energy for presentation of a proposal ([Appendix G](#)) for assistance in the study of scientific and economic information regarding oil and gas recovery and enhanced recovery techniques. Mr. Tim Zoba, IHS Energy, provided a brief overview of the structure of IHS Energy. Mr. Zoba said IHS Energy is a \$8 billion global company with 8,000 employees around the world. He said IHS Energy derives roughly half of its revenue, approximately \$2 billion per year, from the energy sector. He said IHS Energy is one of the largest integrated information, data, software, and consulting companies in the world. He said IHS Energy has been publicly traded since 2005 and has conducted business with over 75 percent of all fortune 500 companies. He said IHS Energy's consulting business brings in nearly \$60 million per year. He said IHS Energy employs approximately 300 full-time consultants, 1,200 experts and researchers, 1,400 industry analysts, 800 software developers, a very large economic forecasting sector, and has over 140 offices worldwide. He said IHS Energy has completed over 40 acquisitions in the energy sector since 1995 so the company is well suited to address all phases of energy development. He said IHS Energy has provided consulting services to companies seeking to invest in the Eagle Ford and Bakken Formations and has worked with various international companies looking to invest in North America. He said IHS Energy's proposal encompasses services from three separate branches of the company. He said the reservoir engineering aspects of the proposal will be addressed by IHS Energy's Calgary team, formerly Fekete Associates Inc., which was acquired by IHS Energy in 2013. He said the economic impact aspects of the proposal will be addressed by Global Insight, which was acquired by IHS Energy in 2010, and the regulatory aspects of the proposal will be addressed by team members based in Houston, Texas and London. He said the regulatory team will be lead by Irena Agalliu and has previously completed work for numerous government bodies including the federal government of the United States; the governments of Alaska, Texas, and New Mexico; and various foreign governments.

Ms. Irena Agalliu, IHS Energy, provided additional information ([Appendix H](#)) regarding IHS Energy's proposal. She said she has a policy background and has spent the majority of her time with IHS Energy analyzing fiscal regimes and taxation policies in the oil and gas upstream sector. She said she has worked on projects for the governments of Russia, Ukraine, Columbia, Mexico, Angola, and Qatar. She said the services IHS Energy proposes to provide entail both scientific and economic analysis. She said results from the scientific analysis would be incorporated into the economic models IHS Energy would create in order to analyze impacts on the current fiscal framework in North Dakota. She said the scientific analysis would involve a technical analysis of enhanced oil recovery techniques, including an overview of the fundamentals of enhanced oil recovery techniques, and a screening of suitable reservoirs in North Dakota for potential implementation of enhanced oil recovery techniques. She said IHS Energy possesses the largest exploration and production database. She said information on every well that has been drilled in the United States and Canada, as well as various other locations around the world, have been entered in IHS Energy's databases. She said the compilation of information pertaining to reservoirs and each well's production enables IHS Energy to conduct a thorough analysis in a much faster manner when compared to services provided by other consultants. She said IHS Energy's geologists and engineers would conduct an assessment of various factors including each reservoir's depth, pressure, and residual oil amounts to assess whether a reservoir might be a good candidate for enhanced oil recovery techniques. She said IHS Energy will also review other enhanced oil recovery techniques projects that have been undertaken in North America and Canada to identify any challenges, opportunities, or lessons that may be applicable to undertaking an enhanced oil recovery techniques project in North Dakota. She said the economic model IHS Energy would provide would apply current tax rates and regulations, on both the state and federal level, to provide an accurate picture of the entire fiscal system. She said IHS Energy would conduct an analysis of before tax and after tax economics and analyze impacts at the state level including any direct, indirect, and induced impacts. She said any taxes that apply at the county level would also be taken into account. She said the cost data on which the economic analysis would be based would reflect actual costs as closely as possible.

In response to a question from Senator Triplett, Ms. Agalliu said IHS Energy would begin its analysis with the current costs of enhanced oil recovery techniques and then apply its outlooks to estimate where costs may be headed in future time periods. She said IHS Energy has the capability to calculate long-term scenarios and outlooks. She said IHS Energy takes a global, macroeconomic view to assess what is happening in the global economy and all of these factors are taken into account when developing a forecast. She said geopolitical and environmental factors are also taken into account to develop the most accurate forecast possible. She said IHS Energy's forecasts are known and used by industry members worldwide. She said once the model is complete, various scenarios and sensitivities would be run through the model to view indicators such as profits before tax, rate of return, cashflow after tax, and various other items. She said once all of these variables were assessed, the

committee would have a good idea of the break-even prices for enhanced oil recovery techniques projects to enable the committee to assess whether there is room for improvement in the current fiscal system. She said the results would also be conveyed to IHS Energy's team in Philadelphia to assess global economic impacts industrywide and review any direct, indirect, and induced impacts at the state and local level pertaining to the environment. She said IHS Energy has a climate change forum that convenes both regulators and industry participants and the forum has conducted a tremendous amount of research regarding carbon emissions from the oil sands in Canada. She said input from this team would be used to address any environmental impacts for purposes of the committee's study.

In response to a question from Representative Kasper, Ms. Agalliu said the services necessary to address the technical and economic analysis requested in the RFP could be provided at a cost of \$395,000. She said IHS Energy would only require a period of 10 weeks to generate, assemble, and report all of the necessary information. She said the reason for the \$635,000 amount quoted in the proposal is due to IHS Energy's understanding that the RFP requested that services be provided over an entire one-year period. She said in IHS Energy's experience, services that span over a one-year period have entailed many meetings with the client and the provision of testimony pertaining to multiple revisions and alternatives over the course of the legislative session. She said if the committee does not require additional services following the submission and presentation of IHS Energy's final report, the additional \$240,000 fee quoted in the proposal for "Ongoing Support" could be eliminated.

In response to a question from Representative Froseth, Ms. Agalliu said IHS Energy is one of the largest consultants in the energy industry. She said she would estimate roughly 70 percent of the companies operating locally use IHS Energy's subscription services and many have also requested consulting services. She said IHS Energy completed a study for the National Stripper Well Association, which analyzed the economic impact of removing various incentives for stripper wells in the United States. She said IHS Energy also completed a study for the United States Department of the Interior. She said this study served to compare the oil and gas fiscal systems that apply to federally owned offshore and onshore lands with the oil and gas fiscal systems adopted by select jurisdictions that compete with the United States for investments in the upstream oil and gas industry. She said IHS Energy ultimately built 152 different models for the United States Department of the Interior over the course of this study.

Copies of both reports were provided at the committee's request following Ms. Agalliu's testimony and are on file with the Legislative Council office.

Senator Bekkedahl said IHS Energy appears to have premier staffing and information gathering capabilities in regard to the oil and gas industry. He asked if IHS Energy also has staff with expertise in the coal industry. In response, Ms. Agalliu said IHS Energy acquired the McCloskey Group Ltd. several years ago, which was a leading coal markets research firm. She said while she does not see the intent of the study to include an in-depth analysis of coal or lignite, she does believe it will be relevant to assess the needs of the industry in terms of carbon emissions and targets within North Dakota. She said any analysis related to the coal industry will be focused mainly on issues relating to carbon capture and sequestration. In response to an additional question from Senator Bekkedahl, Ms. Agalliu said recommendations would be provided in IHS Energy's final report based on the results of the analysis. She said the committee is free to draw its own conclusions from the analysis but various recommendations, in addition to identification of what is considered the optimal solution, will be provided in the report for the committee's consideration.

In response to a question from Senator Triplett, Ms. Agalliu said she did not see any conflict of interest arising due to IHS Energy's work for members of the oil and gas industry. She said the work product delivered by IHS Energy is based on the company's independent data and analysis. She said IHS Energy has a policy that it does not serve as a lobbyist. She said the company's work product can be likened to expert testimony.

In response to a question from Senator Cook, Ms. Agalliu said IHS Energy will assess the amount of CO<sub>2</sub> that has been used in other projects, potential sources of CO<sub>2</sub> in North Dakota, and the effect EPA regulations may have on the availability of CO<sub>2</sub>. She said the lowest cost options for acquiring CO<sub>2</sub> would be considered first. She said current projects would be analyzed to get a picture of the volume of CO<sub>2</sub> that might be necessary if similar technology were employed in North Dakota.

In response to a question from Senator Dotzenrod, Ms. Agalliu said the analysis contained in the final report would take both a deterministic approach and a probabilistic approach. She said the study would identify fields with the most potential for utilizing enhanced oil recovery techniques technology but the decision to invest in enhanced oil recovery techniques ultimately rests with the industry. She said the study would not provide certainty as to the actions industry members would take but it would provide the range of potential for industry members to invest in this technology and whether the fiscal system would encourage those types of investment activities.

In response to a question from Representative Froseth, Ms. Agalliu said the worldwide aspect of IHS Energy's analysis would be used to determine the viability of fields that are in play in North Dakota. She said technology applied in other reservoirs having similar characteristics to those found in North Dakota would be analyzed to determine if the technology could be effectively applied in this state. She said IHS Energy would not provide a detailed analysis of each of these other reservoirs but would simply provide any relevant lessons that may be applicable if North Dakota is able to utilize similar technology.

Chairman Unruh called on Mr. John Harju, Vice President for Strategic Partnerships, Energy and Environmental Research Center, for presentation of a proposal ([Appendix I](#)) for assistance in the study of scientific and economic information regarding oil and gas recovery and enhanced oil recovery techniques. Mr. Harju provided committee members with additional materials ([Appendix J](#)) regarding the Energy and Environmental Research Center's proposal. He reviewed how an enhanced oil recovery techniques project might evolve. He said a conventional, non-Bakken, oil field typically goes through a period of primary extraction where the reservoir's fluids are lifted from the subsurface. He said the secondary phase of recovery generally involves a water flood and the final phase of recovery involves application of a tertiary recovery method such as the injection of CO<sub>2</sub>. He said a reservoir's response to a water flood is probably the best indicator of how it would respond to CO<sub>2</sub> injection. He said there are currently 71 water floods in the state but no existing CO<sub>2</sub> floods. He said there is a world class CO<sub>2</sub> project underway in the Weyburn Field in Saskatchewan. He said the CO<sub>2</sub> used in that field is provided by Dakota Gasification Company. He reviewed various graphs that compared the Weyburn Field to those present in North Dakota.

Mr. Harju said Dr. Benjamin Cook, an economist with the University of Wyoming, would be one of the team members contributing to the study. He reviewed a series of outlooks generated from a proprietary model Dr. Cook developed for the State of Wyoming. He said the Energy and Environmental Research Center's proposal would include incorporating North Dakota specific data into this model. He reviewed the large amount of upfront capital investment that is required for an enhanced oil recovery techniques project. He said a project generally does not realize any profit for an extended period of time. He said there are some projects in Texas that have been ongoing for upwards of 30 years. He described a project underway in the Bell Creek Field in eastern Montana and said the Energy and Environmental Research Center has been very involved in this project. He said the main limiter in using CO<sub>2</sub> for enhanced oil recovery techniques is the availability of CO<sub>2</sub>. He said in 2012, enhanced oil recovery techniques produced roughly 2 million barrels of oil per day. He said only 350,000 of those barrels were produced as a result of enhanced oil recovery techniques using CO<sub>2</sub>. He said the majority of the remaining barrels were produced through the use of water flooding. He reviewed slides illustrating the challenges of using enhanced oil recovery techniques technology in the Bakken Formation. He said substantial investments have been made by the United States Department of Energy, the Industrial Commission, and various industry members to seek a workable solution to making enhanced oil recovery techniques in the Bakken Formation economically viable. He said to date, there have only been five injection tests conducted in the Bakken Formation. He said three involved gas phase injection and two involved water with the intention to follow with injection of CO<sub>2</sub>. He said the Energy and Environmental Research Center has studied the results of all of these tests. He said thus far, these test have shown that an enhanced oil recovery techniques project would not be viable under any tax rate.

Mr. Harju reviewed the credentials of various other team members who would be contributing to the study. He said James Sorensen, Senior Research Manager, Energy and Environmental Research Center, has excellent credentials for conducting and managing research in the field of enhanced oil recovery techniques. He said Dean Bangsund, Research Scientist, North Dakota State University, has generated many landmark economic impact studies in the state relating to agriculture and oil and gas. He said former Tax Commissioner Cory Fong, Public Affairs Senior Specialist, Odney, would be assisting the team in navigating the tax code, and Dr. Nick Azzolina, CETER Group, Inc., would be analyzing CO<sub>2</sub> storage associated with enhanced oil recovery techniques projects. He said in addition to the analysis provided by these team members, the Energy and Environmental Research Center would also consult with a technical advisory board. He said members of the technical advisory board are Ron Ness, President, North Dakota Petroleum Council; Lynn Helms, Director, Oil and Gas Division, Industrial Commission; Mike Jones, Vice President, Research and Development, Lignite Energy Council; and Vicky Steiner, Executive Director, North Dakota Association of Oil and Gas Producing Counties.

Mr. Harju said, as the team lead, the Energy and Environmental Research Center brings broad experience and capabilities to the study. He said the Energy and Environmental Research Center has engaged more than 150 members from the private and public sectors representing fossil energy stakeholders across the globe. He said the Energy and Environmental Research Center has lead the Plains CO<sub>2</sub> Reduction Partnership for over 10 years and has conducted regional assessments of enhanced oil recovery techniques opportunities under this project. He said the Energy and Environmental Research Center's Partnership for CO<sub>2</sub> Capture Technology Development Project, established in 2008, has focused on reducing capture costs of CO<sub>2</sub> from coal-fired power generation. He also noted the Energy and Environmental Research Center's involvement in the Bakken CO<sub>2</sub> Storage and Enhanced Recovery Program, established in 2012, and the Bakken Production Optimization Program, initiated in 2013. He compared the

results from a study completed by the Energy and Environmental Research Center in 2005 and one completed by Advanced Resources International, Inc., out of Washington, D.C. in 2006 to illustrate the variation in the results of each study. He said several fields identified by the Energy and Environmental Research Center as having potential for enhanced oil recovery techniques were not even mentioned in results provided in Advanced Resources International, Inc. He said this comparison highlights the value of the Energy and Environmental Research Center's use of local data and resources when assessing a field. He said local knowledge of these fields, using boots on the ground assessment in North Dakota, is what allowed the Energy and Environmental Research Center to identify fields that were not identified by Advanced Resources International, Inc. He said the Energy and Environmental Research Center was also retained as a subcontractor by the firm KLJ in the firm's study of North Dakota oil and gas impacts for the 2013-14 interim Energy Development and Transmission Committee. He said in that study, the Energy and Environmental Research Center focused on fields having the greatest potential for enhanced oil recovery techniques within the next five years. He said enhanced oil recovery techniques projects have an extremely high attrition rate from the point of contemplation to the point of implementation. He said this is almost always due to the lack of available CO<sub>2</sub> at a price that is economically feasible for a project to go forward.

Mr. Harju said the economic portion of the study would be addressed by building on existing models and methods and incorporating updated data in order to evaluate the long-term potential for enhanced oil recovery techniques. He said the economic analysis would take into account additional estimated oil production, additional CO<sub>2</sub> demand, cashflows associated with a wide range of oil prices, potential environmental factors, impacts on population, community infrastructure needs, and potential revenues from taxes. He said the effects of existing and alternative tax incentives would also be evaluated. He said the report would include analysis of impacts on state, regional, and local government expenditures associated with the growth of the industry. He said the report would also include recommendations for the top tax incentive options to encourage enhanced oil recovery techniques in this state and provide the greatest benefit to North Dakota industries. He said the scientific portion of the study would assess the long-term potential for enhanced oil recovery techniques in this state using the Energy and Environmental Research Center's deep knowledge of CO<sub>2</sub> capture technology. He said additional enhanced oil recovery techniques methods would also be assessed including thermal, chemical, and gas phase injection. He said the long-term incremental production estimates for each of these additional methods would be assessed within each of the applicable North Dakota formations. He said the final product would include a summary of the most effective enhanced oil recovery techniques techniques and the attendant time lines related to each technique. He said the total cost of the project would be just under \$400,000 and progress would be communicated to the Taxation Committee as specified in the RFP.

In response to a question from Representative Kasper, Mr. Harju said the Energy and Environmental Research Center interacts with the Department of Mineral Resources on a continuous basis to receive updated well data.

In response to a question from Representative Kelsh, Mr. Harju said the project cost is inclusive of the final report and the provision of any additional updates or presentations requested by the committee.

In response to questions from Representative Hatlestad, Mr. Harju said the Energy and Environmental Research Center was involved in a project in Williams County in which CO<sub>2</sub> was injected into an existing well to evaluate the utility of CO<sub>2</sub> in increasing productivity. He said the Energy and Environmental Research Center also lead a project in Burke County in which CO<sub>2</sub> was injected into a coal seam to evaluate its movement and the potential for storage of CO<sub>2</sub> within the coal seam. He said additional CO<sub>2</sub> is slated to be available from Dakota Gasification Company sometime within the next year.

Senator Triplett asked whether additional CO<sub>2</sub> could be made available from lignite-fired power plants in an economical manner. Mr. Harju said the Energy and Environmental Research Center has been involved in understanding lignite coal and its conversion to power since 1951 when the facility was originally commissioned by the United States Bureau of Mines. He said the Energy and Environmental Research Center has been involved with the lignite industry since 1993 both in the mining industry and the electrical generating industry. He said since 2008, the Energy and Environmental Research Center has been engaged with North Dakota's lignite industry in evaluating carbon capture as a retrofit for the existing fleet of power cells in the state and in evaluating the potential for new platforms. He said the Energy and Environmental Research Center has also had many discussions with the lignite industry, Lignite Energy Council, and the Lignite Research Council regarding the Allam Cycle.

In response to a question from Senator Triplett, Mr. Harju said there would be no conflict of interest created by the Energy and Environmental Research Center's previous work with members of the coal and oil industry. He said the Energy and Environmental Research Center always focuses on the needs of its clients and in this case the client would be the government of the State of North Dakota requesting the potential utility of various tax incentives or rates on enhanced oil recovery techniques and that is the information the Energy and Environmental Research Center would provide.

Senator Cook asked if Mr. Harju thought some of the members listed in the Energy and Environmental Research Center's proposal could be unbiased considering their employment. In response, Mr. Harju said, regardless of an individual's views on climate change, there is an obsession at the federal level to manage CO<sub>2</sub> and the hurdle to do so is very substantial. He said if North Dakota were to attempt to manage CO<sub>2</sub> without any enhanced oil recovery techniques revenue, one industry and its customers would bear the brunt of that management goal. He said the lignite industry has a commodity that is economically challenged as a result of federal regulation. He said the oil industry would like to possess that commodity, but likely not at the same price the lignite industry could provide it.

Senator Triplett said her concern with the advisory board related more to the economic aspect of the study. She said some of the members on the advisory board have ready access to legislators over the legislative session yet the structure of the Energy and Environmental Research Center's proposal allows these team members to, in a way, mediate the process upfront. In response, Mr. Harju quoted the portion of the RFP pertaining to the impact tax changes may have on the interests of various groups. He said, based on the language of the RFP, he believed the advisory board was critical in order to be responsive to the study that was requested.

Senator Triplett asked who would be representing environmental concerns on the Energy and Environmental Research Center's team. In response, Mr. Harju identified advisory board member Lynn Helms and said, as the chief regulator of the oil and gas industry, Mr. Helms also has the responsibility to regulate the environmental footprint of the industry.

In response to a question from Chairman Unruh, Mr. Harju said he believed the advisory board was a critical component of the Energy and Environmental Research Center's proposal. He said local knowledge in certain areas is something that can only come from regional leaders such as the ones the Energy and Environmental Research Center has recruited. He said none of the advisory board positions were paid positions.

Senator Triplett asked if the Energy and Environmental Research Center would consider revising its proposal to provide only the technical analysis and bring IHS Energy in as a consultant to provide the economic analysis. Mr. Harju said the Energy and Environmental Research Center has been an absolute force in the economic viability of enhanced oil recovery techniques assessment in the United States since 2003 and said the only assessment the Energy and Environmental Research Center has not conducted is to turn the knob on the tax number.

In response to a question from Chairman Unruh, Mr. Harju said if the committee directed the Energy and Environmental Research Center to work with IHS Energy, the Energy and Environmental Research Center would do so. He said he believes the client's needs should dictate the products they receive.

Senator Triplett asked Mr. Zoba if IHS Energy would consider reworking its proposal to work with the Energy and Environmental Research Center to incorporate the Energy and Environmental Research Center's specific knowledge regarding reservoir characteristics into the data IHS Energy uses to conduct its economic analysis. In response, Mr. Zoba said this is something IHS Energy could take into consideration after receiving additional direction from the committee.

Senator Dotzenrod said he appreciates IHS Energy's willingness to work with the committee but said it appears that the technical analysis is a primary driver in determining the outcome of the economic analysis. He said it may be more difficult to have two teams attempting to jointly complete the project than it would be for just one team to complete both portions of the analysis.

Ms. Agalliu said she shared Senator Dotzenrod's concerns and said the economic analysis is dependent on the technical analysis and it may be challenging for IHS Energy to complete the economic analysis if IHS Energy does not agree with the results of the technical analysis. She said it would represent a significant challenge for IHS Energy to put its name on a product if it did not agree with the technical data on which that product was based.

## COMMITTEE DISCUSSION

Chairman Unruh said the committee has received two very thorough and informative proposals regarding its study and that she knows committee members want to be very diligent about spending taxpayer dollars. She said the committee should be mindful of the investment it is making in the future of North Dakota and invited committee members to provide comments regarding the two proposals that were received.

Senator Cook said this study provides a valuable opportunity. He said if the technology behind using CO<sub>2</sub> for enhanced oil recovery techniques can be worked out, the state could benefit from both increased oil production and increased compliance with federal CO<sub>2</sub> regulations. He said there was a time when the technology did not exist to capture any oil out of the Bakken Formation. He said tax incentives provided motivation for companies to overcome that technology barrier and the state has benefited from oil production. He said with this study the

committee needs to address both the technological and economic aspects of enhanced oil recovery techniques. He said when tax issues are debated during the next legislative session, members of the 2017 Legislative Assembly will need to make informed decisions based on information that is viewed as credible and unbiased. He said both consultants presented excellent proposals and are very capable. He said, unfortunately, he was not sure that one of the consultants could deliver results that would be viewed as completely unbiased. He said he would be more comfortable if the Energy and Environmental Research Center's proposal did not contain an advisory board.

Representative Dockter said he agreed with Senator Cook's statements.

**It was moved by Representative Dockter and seconded by Senator Cook that the committee recommend the Chairman of the Legislative Management enter into a contract with IHS Energy to assist with the study of enhanced oil recovery.**

Mr. Walstad suggested clarifying the motion to indicate that the costs identified for "Ongoing Support" in IHS Energy's proposal were not included in the committee's recommendation to the Chairman of the Legislative Management.

Chairman Unruh asked if Representative Dockter would care to amend his motion to provide for this clarification.

**The motion was amended and it was moved by Representative Dockter, seconded by Chairman Cook, that the committee recommend the Chairman of the Legislative Management enter into a contract with IHS Energy, exclusive of the costs identified for "Ongoing Support," to assist with the study of enhanced oil recovery.**

Senator Triplett said she thought the Energy and Environmental Research Center had more in-depth knowledge regarding the technical aspects of the study and encouraged IHS Energy to consider accessing some of the Energy and Environmental Research Center's expertise in the event the motion passes. She said she thought the economic analysis was much more complex than Mr. Harju's characterization of just needing to turn the knob on the tax code. She said if it were that easy the committee would not need to study the issue.

Senator Laffen said he would not be in favor of the motion. He said it is a rare occasion when in-state expertise aligns with items requested in a study. He said he likes the fact the Energy and Environmental Research Center is local and would be accessible to the committee. He said if the committee is uncomfortable with the Energy and Environmental Research Center's advisory board the committee could simply request the advisory board be excluded from the Energy and Environmental Research Center's proposal.

**The motion that the committee recommend the Chairman of the Legislative Management enter into a contract with IHS Energy, exclusive of the costs identified for "Ongoing Support," to assist with the study of enhanced oil recovery carried on a roll call vote.** Senators Bekkedahl, Cook, Dotzenrod, and Triplett and Representatives Headland, Dockter, Kelsh, and Mitskog voted "aye." Senators Unruh and Laffen and Representatives Froseth, Hatlestad, Kading, and Kasper voted "nay."

The committee discussed the possibility of delaying the date IHS Energy would begin its analysis so the most recent data would be included in the study. Committee members expressed a preference to have all relevant 2015 data included in the analysis and have a final report delivered by July 1, 2016.

Chairman Unruh called representatives of IHS Energy to the podium to discuss the possibility of a delayed start date for IHS Energy to undertaking its analysis. Mr. Zoba said a delayed start date would be feasible. Ms. Agalliu said if a contract is signed now the committee could lock in the stated rate and reserve the team. She said the team members could organize themselves as to how the work is completed and ensure the committee receives a final report by July 1, 2016, based on production data through the end of 2015.

No further business appearing, Chairman Unruh adjourned the meeting at 2:45 p.m.

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Emily L. Thompson  
Counsel

ATTACH:10