ENERGY DEVELOPMENT AND TRANSMISSION COMMITTEE

The Energy Development and Transmission Committee was created in 2007 and was made permanent in 2011. Under North Dakota Century Code Section 54-35-18, the committee must study the impact of a comprehensive energy policy for the state. The study may include reviewing and recommending policies related to extraction, generation, processing, transmission, transportation, marketing, distribution, and use of energy.

In addition to its statutory study responsibilities, the committee was assigned the following two studies for the 2015-16 interim:

- Section 6 of 2015 House Bill No. 1176 provides for a study of oil and gas tax revenue allocation formulas. The study must include consideration of the allocations to political subdivisions.
- Senate Bill No. 2372 (2015) provides for a study of the impacts and costs of the federal Environmental Protection Agency (EPA) regulations of carbon dioxide emissions from new and existing electrical generation units. The study must include consideration of the cost of regulations on the industry and ratepayers as well as the status of technologies designed to reduce carbon dioxide emissions.

The committee is responsible for receiving various reports, as assigned by the Legislative Management, including:

- A biennial report from the Energy Policy Commission regarding recommendations for a comprehensive energy policy pursuant to Section 17-07-01.
- A biennial report from the North Dakota Transmission Authority regarding its activities pursuant to Section 17-05-13.
- A biennial report from the North Dakota Pipeline Authority regarding its activities pursuant to Section 54-17.7-13.
- A report, beginning December 2014 and every 4 consecutive years thereafter, on the amount of money in the carbon dioxide storage facility trust fund and on the amount of fees needed to satisfy the fund's objectives pursuant to Section 38-22-15. (The committee did not receive a report because the next report is scheduled to be received in December 2018.)
- A report from a coal conversion facility that achieves a 20 percent capture of carbon dioxide emissions and receives a tax credit pursuant to Section 57-60-02.1.
- A report, by December 1, 2015, from the Energy and Environmental Research Center regarding recommendations on the existing regulations for crude oil and produced water pipelines and recommendations on the feasibility and cost-effectiveness of requiring detection and monitoring technology on new and existing pipeline systems pursuant to Section 8 of 2015 House Bill No. 1358.
- A report each year of the 2015-16 interim regarding the status of retail electricity sales meeting or exceeding the state renewable and recycled energy objective pursuant to Section 5 of 2015 Senate Bill No. 2037.

Committee members were Senators Rich Wardner (Chairman), Kelly M. Armstrong, Brad Bekkedahl, Bill L. Bowman, Philip M. Murphy, and John M. Warner and Representatives Dick Anderson, Mike Brandenburg, Chuck Damschen, Ben Hanson, Corey Mock, and Todd Porter.

OIL AND GAS TAX ALLOCATION FORMULAS STUDY

The Legislative Management assigned the committee the responsibility to study oil and gas tax revenue allocation formulas, including allocations to political subdivisions. The committee received information on the historical and current oil and gas tax rates and allocation formulas from state agencies. The committee also received information from political subdivisions regarding the use of oil and gas tax allocation funding, infrastructure projects, and challenges in government operations.

Information from State Agencies

Oil and Gas Tax Revenue

The committee received information from the Tax Department regarding oil and gas tax revenue collections for the 2013-15 biennium. The collections exceeded $6 billion, which was approximately $120 million more than the March 2015 revised revenue forecast. Oil prices ranged from a low of $35.99 per barrel to a high of $97.18 per barrel during the 2013-15 biennium. Oil and gas tax revenue collections decreased in the 2015-17 biennium compared to the 2013-15 biennium primarily due to lower oil prices and lower oil production.

Tax Allocations

The committee learned the State Treasurer's office allocates the oil and gas tax collections to political subdivisions and state funds pursuant to the allocation formulas. The oil extraction tax allocation formulas are based on percentage allocations to five funds including the common schools trust fund, the foundation aid stabilization fund, the resources trust fund, the legacy fund, and the general fund. Twenty percent of oil and gas gross production tax allocations are distributed to hub cities, hub city school districts, and selected state funds based on specified amounts and percentages. The remaining 80 percent of oil and gas gross production tax allocations are allocated to counties and the state based on percentages. The changes to the allocations to state funds became effective in August 2015, while the changes to the political subdivision allocation formulas became effective in September 2015.

Oil and Gas Employment

The committee received information from Job Service North Dakota regarding the process for compiling oil- and gas-related employment data related to hub cities. The agency identifies jobs by worksite to provide greater accuracy in determining the location of oil- and gas-related jobs. The agency monitors company operations and business models to determine if jobs are related to the oil and gas industry. Oil- and gas-related employment reached a peak in calendar year 2014 before decreasing in calendar year 2015. The decrease in employment was related to the decrease in oil and gas development activity due to low oil prices and was related to operational efficiencies in the oil industry. The committee learned North Dakota's unemployment rate has remained steady even though oil- and gas-related employment has decreased. The unemployment rate is based on North Dakota residents and does not include out-of-state workers.

Impact Grants

The committee learned the 2015 Legislative Assembly appropriated $139.3 million from the oil and gas impact grant fund for grants, including $132.5 million of designations for specific grant categories. The Department of Trust Lands awarded $42 million, but suspended future grants due to lower than anticipated oil tax revenues to the fund. An additional $6 million of grants is required to be awarded in January 2017. Future grant rounds will not be scheduled until the fund receives sufficient revenues to provide for the existing obligations. The Department of Trust Lands received guidance from the Attorney General's office that the department seek legislative guidance regarding the intent of any grant designations that are unable to be awarded during the 2015-17 biennium due to revenue collections being less than anticipated.

Oil and Gas Activity

The Department of Mineral Resources provided information to the committee regarding oil and gas activity in the state. The committee learned the decrease in oil prices led to a decrease in drilling and fracturing operations, which resulted in a decrease in oil production. Based on the department's analysis, the statewide average breakeven price for an oil well is $26 per barrel ranging from $16 per barrel in Dunn County to over $100 in Bottineau, Bowman, Renville, and Slope Counties. Drilling activity is concentrated primarily in Dunn County and McKenzie County because of lower breakeven prices. Since the oil and gas tax allocations are based on oil and gas tax revenue collections in each county, the allocations to counties located on the edges of the Williston Basin are anticipated to decrease as the oil production in those counties decreases.

Enhanced Oil Recovery

The committee traveled to the Energy and Environmental Research Center to receive information regarding energy-related research, including enhanced oil recovery research. Under current techniques, approximately 3 to 10 percent of the available oil can be recovered, but a small increase in the recovery percentage can result in billions of barrels of additional production. Enhanced oil recovery with water may not be effective in North Dakota because of the geology of the Williston Basin. Enhanced oil recovery using carbon dioxide is still in the process of being tested for the Williston Basin. The length of time before oil production starts, after injecting the carbon dioxide, is unknown, but could range from a few days to a few years. The committee learned the additional oil production from enhanced oil recovery could result in an increase in oil tax collections as well as an increase in economic activity.

Core and Sample Library

The committee also toured the Wilson M. Laird Core and Sample Library in Grand Forks and received information on the status of an expansion project. Oil companies use the library to conduct research prior to drilling wells.

Information from Political Subdivisions

The committee traveled to Williston, Watford City, and Stanley to receive information from entities in oil-producing counties as a part of the oil and gas tax allocation formula study. The entities included cities, school districts, counties, developmental disabilities providers, nursing homes, providers serving victims of domestic abuse and sexual violence, utility companies, law enforcement, and health care providers. The entities provided information on the following:

- Infrastructure projects, including the use of state funds for certain projects, the status of current projects, and future infrastructure needs.
- Challenges in operations, including safety concerns and employee recruitment and retention issues.
- Financial status, including current and projected debt levels, funding needs, and sources of revenue.

The committee learned state funding has helped political subdivisions address infrastructure challenges and has helped social service providers and health care providers with some of their challenges in operations. The committee also learned the decrease in oil and gas development activity has eased some of the infrastructure, operating, and financial challenges for entities located in oil-producing counties. However, some challenges, such as the need for behavioral health services, have remained constant or even increased despite the decrease in oil and gas development activity.

Committee Consideration

The committee discussed the current oil and gas tax allocation formulas as well as possible changes to the formulas. An issue for the 2017-19 biennium is balancing an adequate level of funding for political subdivisions to meet their needs with an adequate level of funding for necessary state programs. Another issue for the 2017-19 biennium is providing an adequate level of funding for the hub cities to continue servicing their debt payments. The possible changes to the oil and gas tax allocation formulas considered by the committee include:

- Adjust the amounts allocated to hub cities from the 1 percent of the 5 percent oil and gas gross production tax.
- Adjust the amounts allocated to hub city school districts from the 1 percent of the 5 percent oil and gas gross production tax.
- Maintain funding levels for school districts.
- Address concerns related to the allocations to the oil and gas impact grant fund and the designation of grants from the fund.
- Adjust the funding level for political subdivisions.
- Change the base year used for the allocations to political subdivisions from 2014 to 2016.
- Change the allocations to the strategic investment and improvements fund and the political subdivision allocation fund.
- Add an allocation to the budget stabilization fund.
- Simplify the allocation of the state's share to provide $300 million to the general fund, $300 million to the tax relief fund, up to $22 million to the state disaster relief fund, and all remaining revenue to the strategic investment and improvements fund.

Recommendation

The committee makes no recommendation regarding the study of oil and gas tax allocation formulas.

ENVIRONMENTAL PROTECTION AGENCY REGULATIONS STUDY

The Legislative Management assigned the committee the responsibility to study the impacts and costs of the EPA regulations of carbon dioxide emissions from new and existing electrical generation units.

Regulations and Compliance

The committee learned the EPA's Clean Power Plan establishes a federal-state process of regulations for limiting carbon dioxide emissions from power plants. The rules apply to new electrical generation facilities, which are regulated under Section 111(b) of the federal Clean Air Act, and apply to existing electrical generation facilities, which are regulated under Section 111(d) of the Clean Air Act. The rules in the proposed Clean Power Plan are intended to reduce carbon dioxide emissions nationally by 32 percent by the year 2030. The final rules, published in October 2015, focus on the following three primary methods for reducing carbon dioxide emissions:

- Improving the average efficiency of coal-powered electrical generation units.
- Displacing coal-powered electrical generation systems with natural gas-powered electrical generation systems.
- Reducing the need for future fossil fuel-based electrical generation systems by increasing electrical generation from zero-carbon systems.

The committee received information from the Lignite Energy Council regarding options to comply with the Clean Power Plan. North Dakota is able to comply with the EPA regulations, but compliance has a cost. The Allam Cycle is a potential technology solution for compliance that allows coal to continue to be used for electrical generation. However, the Allam Cycle is still in the early stages of development, and the estimated cost to fully develop a commercially viable system using the Allam Cycle ranges from $300 million to $1 billion. Other options for compliance include:

- Replace 45 percent of the existing coal-powered generation with wind-powered generation;
- Capture carbon dioxide emissions from coal-powered generation for use in enhanced oil recovery;
- Develop cofiring facilities capable of using coal and either natural gas or biomass;
- Construct a nuclear power plant; or
- Purchase renewable energy credits, which are estimated to cost $200 million to $400 million per year.

The committee received information from the State Department of Health regarding the compliance requirements. States can achieve compliance using a rate-based calculation or a mass-based calculation. The rate-based calculation uses pounds of carbon dioxide per megawatt hour of electricity produced. The mass-based calculation uses total tons of carbon dioxide produced. The rate-based reductions increased from a reduction of 24.7 percent under the EPA's proposed rules to a reduction of 44.9 percent under the EPA's final rules, while the mass-based reductions increased from a reduction of 10.5 percent to a reduction of 37.4 percent. North Dakota had the second largest increase in the required reductions under the EPA's final regulations compared to all other states.

The committee learned states are required to submit final drafts of their compliance plans by September 2016 or states can file initial drafts of their compliance plans by September 2016 along with a request for an extension to file the final draft by September 2018. However, a motion to stay was granted during the litigation process, and as a result, states are not required to submit their compliance plans while the litigation is pending.

The committee received information from the Attorney General's office regarding legal action related to the EPA's Clean Power Plan. North Dakota submitted extensive comments on the proposed Clean Power Plan during the comment period. North Dakota filed a petition for review on October 23, 2015, related to the final rules for new power plants. Since North Dakota was the first to file, all other cases related to the final rules for new power plants will be consolidated with the North Dakota case. North Dakota also filed a petition to challenge the final rules related to existing power plants. North Dakota's case will be consolidated with West Virginia's case, because West Virginia was the first to file. North Dakota's primary legal arguments include:

- The EPA cannot regulate existing power plants under the new rules, because existing power plants are already regulated under a different set of existing rules.
- The EPA exceeded its authority in violation of state's rights under the Clean Air Act.
- The EPA did not provide an opportunity for comments on the changes in the final rules from the proposed rules.

Potential Impact of the Regulations

The committee learned the EPA anticipates the Clean Power Plan will result in climate benefits, health benefits, and economic benefits. The EPA estimates the net benefit of the Clean Power Plan includes $26 billion to $45 billion of climate- and health-related benefits. The EPA estimates the Clean Power Plan will result in 3,600 fewer premature deaths, 1,700 fewer heart attacks, and 90,000 fewer asthma attacks.

The committee received information from the Energy and Environmental Research Center regarding carbon management. Current carbon management projects include the Boundary Dam project in Estevan, Saskatchewan; the Bell Creek project in Bell Creek, Montana; and a lignite field test in northwestern North Dakota. The Boundary Dam project is a $1 billion project that will capture approximately 1 million tons of carbon dioxide per year, which can be used in enhanced oil recovery or which can be sequestered through underground injection. The Bell Creek project will inject 1 million tons of carbon dioxide per year into the Bell Creek oil field for enhanced oil recovery, and the project is anticipated to produce approximately 40 million to 50 million barrels of incremental oil. The lignite field test successfully injected approximately 90 tons of carbon dioxide into an unminable lignite seam for long-term storage. Capturing carbon dioxide emissions from power plants in North Dakota could benefit the oil and gas industry by providing a source of carbon dioxide for enhanced oil recovery.

The committee learned the Congressional Budget Office estimated the cost of complying through renewable energy credits to be approximately $890 per household by the year 2020. A study conducted by the National Economic Research Associates estimated average annual electricity prices in North Dakota would increase by approximately 43 percent under the final rules of the Clean Power Plan. The committee received information from the Public Service

Commission, which estimated North Dakota's compliance costs to be $375 million per year or approximately $50 per person per month.

The committee received information from industry representatives regarding the potential impact of the Clean Power Plan. Coal-powered electrical generation may not be an option in the future resulting in lost jobs, less economic activity, and less state revenue. The coal industry, including mining and power generation, provides approximately 16,000 jobs and contributes $3 billion of annual economic activity for North Dakota. The regulations may limit the ability of utility companies to supply additional electricity for future demand growth.

The committee received information from Job Service North Dakota regarding employment in the coal industry. Coal-related employment consistently provides some of the highest wages in the state. In the first quarter of calendar year 2015, coal mining jobs paid an average quarterly wage of approximately $25,000 compared to the state average of $12,775. Utility-related jobs, which are closely related to the coal industry, paid an average quarterly wage of approximately $21,000.

The committee received information from the Tax Department regarding the coal severance tax and the coal conversion facilities privilege tax. Revenue from the tax collections is distributed to political subdivisions and to state funds. The combined tax collections for both tax types have averaged approximately $35 million to $40 million per year since 1999.

Recommendation

The committee makes no recommendation regarding the study of EPA regulations of carbon dioxide emissions from new and existing electrical generation units.

COMPREHENSIVE ENERGY STUDY

The committee is responsible for studying comprehensive energy policy for the state. As part of this study, the committee received a report from the Energy Policy Commission, also known as the EmPower ND Commission.

Energy Policy Commission

In 2009 the Energy Policy Commission was created by Section 17-07-01 to develop a comprehensive energy policy and to monitor progress toward reaching the goals of the policy. The commission consists of the Commissioner of Commerce as Chairman and members appointed by the Governor to represent the agricultural community, Lignite Energy Council, North Dakota Petroleum Council, biodiesel industry, biomass industry, wind industry, ethanol industry, North Dakota Petroleum Marketers Association, North Dakota investor-owned electric utility industry, generation and transmission electric cooperative industry, lignite coal-producing industry, refining or gas-processing industry, and additional nonvoting members.

The committee received a report from the Energy Policy Commission regarding policy recommendations. The commission's recommendations relate to infrastructure, research and development, and the regulatory environment.

Infrastructure:

- Continue support for key infrastructure for energy and community development throughout the state.
- Provide funding and low-interest loan programs to ensure the completion of critical infrastructure projects.
- Expand existing water systems, including increased access to Lake Sakakawea for community and commercial needs.
- Monitor railroad infrastructure upgrades to ensure commodities can be delivered to markets.
- Continue support for the Department of Agriculture's ombudsman pipeline program.
- Clarify state permitting and jurisdictional authority to streamline the permitting process and avoid duplication with local political subdivisions.

Research and development:

- Continue support for existing research and development programs.
- Remove the expiration date related to the allocation of 5 percent of the general fund share of coal conversion tax revenue to the lignite research fund.
- Provide $10 million per biennium for fundamental research with oversight by the Lignite Research Council and the Oil and Gas Research Council.

- Provide $50 million per biennium for pilot and commercial demonstration projects.
- Create a strategy to develop hydrocarbon and biochemical industries in the state.
- Create an impact model to understand the integration of traditional and renewable electrical generation.

Regulatory environment:

- Encourage federal agencies to work with state agencies when developing regulations.
- Encourage state agencies to provide updates on energy-related issues.
- Establish opportunities for state and federal regulatory agencies to collaborate on federal rulemaking.
- Develop opportunities for value-added technologies.
- Provide adequate funding and staff for the Environmental Health Section of the State Department of Health.

Additional recommendations:

- Remove the expiration date related to a sales and use tax exemption for the materials used in the construction of a wind-powered electrical generation facility.
- Support incentives to encourage carbon dioxide capture and enhanced oil recovery.
- Provide funding for career and technical education programs to ensure a quality workforce.

CONSIDERATIONS

Oil Extraction Tax Credit for Enhanced Oil Recovery With Carbon Dioxide Bill Draft

The committee considered a bill draft relating to an oil extraction tax credit for enhanced oil recovery with carbon dioxide. The bill draft provides a $10 credit against oil extraction taxes for each ton of carbon dioxide purchased or acquired for use in enhanced oil recovery in the state. Oil producers would be required to report to the Industrial Commission regarding the amount of carbon dioxide initially injected into an oil reservoir. The committee made no recommendation regarding the bill draft because the Taxation Committee was assigned the responsibility to study enhanced oil recovery.

Wind Turbines Bill Draft

The committee considered a bill draft relating to a sales and use tax exemption for materials used in the construction of wind turbines. The bill draft removes the expiration dates for the sales tax exemption and the use tax exemption. The bill draft includes a retroactive application to provide continuity between the existing expiration date and the effective date of the proposed changes.

The committee received information from the Tax Department regarding the estimated fiscal impact of the bill draft. An official estimate for the fiscal impact of the bill draft cannot be determined because the number of wind turbines that may be installed is unknown. Based on a theoretical example from the Tax Department, if the sales and use tax exemption was made permanent and a 500 megawatt wind farm project were completed during the 2017-19 biennium, state sales tax collections would decrease by $20 million to $30 million.

The committee received information from the Department of Commerce regarding a cost-benefit analysis relating to a sales and use tax exemption for wind turbines. Information regarding the actual incentives received by companies is not available due to confidentiality restrictions. The estimated return to the state from the sales and use tax exemption was calculated using publicly available data and an economic model. Based on a sample scenario, the cost of the exemption is approximately $10.5 million with 50 percent of the cost returned to the state in 2 years and 7 percent per year returned to the state thereafter.

The committee received comments from the Department of Commerce, the Lignite Energy Council, and the electrical generation industry in support of the bill draft. The committee learned the construction of new wind turbines benefits landowners through easement payments, local political subdivisions through property tax revenues, and economic growth through job creation. The sales and use tax exemption will benefit customers with reduced rates, will keep North Dakota's tax environment competitive with Montana and South Dakota, and will provide tax fairness for all types of electrical generation facilities.

Coal Conversion Tax Revenue Allocations Bill Draft

The committee considered a bill draft relating to the allocation of coal conversion tax revenue. The bill draft removes an expiration date which will continue the 5 percent allocation of the general fund share of coal conversion

tax revenue collections to the lignite research fund. The removal of the expiration date is estimated to decrease general fund revenues by $1 million in the second year of the 2017-19 biennium and by $2 million in each biennium thereafter.

The committee received comments from the Lignite Energy Council in support of the bill draft. The committee learned the bill draft allows the lignite industry to continue receiving grant funding for research to help the industry identify solutions to reduce carbon dioxide emissions.

Recommendations

The committee recommends a bill [17.0273.01000] relating to wind turbines which removes expiration dates to continue the sales and use tax exemptions for materials used in the construction of wind turbines.

The committee recommends a bill [17.0271.01000] relating to the allocation of coal conversion tax revenue which removes an expiration date and continues the 5 percent allocation of the general fund share of coal conversion tax revenue collections to the lignite research fund.

NORTH DAKOTA TRANSMISSION AUTHORITY REPORT

The committee received a report from the North Dakota Transmission Authority pursuant to Section 17-05-13. The transmission line from Fargo to Monticello, Minnesota was completed as part of the CapX2020 transmission line project while the remaining lines to connect various cities in Minnesota are expected to be complete in 2017. The CapX2020 project is part of a regional effort to enhance electrical reliability and to provide access to renewable energy within the Midwest. The report included a preliminary analysis of the impact of the EPA's Clean Power Plan and identified the loss of 14 gigawatts of coal electrical generation in the Midcontinent Independent System Operator region, which includes North Dakota, South Dakota, Nebraska, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Michigan, Montana, Missouri, Kentucky, Arkansas, Texas, Louisiana, and Mississippi. Installed electrical generation capacity in North Dakota totals 7,001 megawatts, consisting of 4,184 megawatts from coal, 1,876 megawatts from wind, 583 megawatts from water, and 358 megawatts from natural gas.

NORTH DAKOTA PIPELINE AUTHORITY REPORT

The committee received multiple updates from the North Dakota Pipeline Authority on oil and gas pipelines in the state. The committee learned oil exports by rail continue to decrease while exports by pipeline continue to increase. Approximately 50 percent of the oil exports from the Bakken Formation were by pipeline in August 2015, and approximately 60 percent of the oil exports were by pipeline in August 2016. Oil exports by rail are primarily destined for the east and west coasts because the pricing premiums in those regions result in higher profits for oil producers. However, the economic benefit of exporting oil by rail is decreasing because transportation costs are increasing and the pricing premiums in the coastal areas are decreasing.

The committee learned pipeline capacity is increasing as new pipelines are constructed. Natural gas pipeline capacity and gas processing plant capacity are anticipated to match the supply of natural gas from the Bakken Formation within a few years. Natural gas flaring is anticipated to decrease as the natural gas gathering and processing capacity increases. Oil pipelines being considered or under construction during the 2015-16 interim included the Dakota Access Pipeline project, the Sandpiper Pipeline project, and the Upland Pipeline project.

CARBON DIOXIDE CAPTURE TAX CREDIT REPORT

The committee was assigned the responsibility to receive a report from a coal conversion facility that achieves a 20 percent capture of carbon dioxide emissions and receives a tax credit. The information was submitted to the Legislative Council office pursuant to Section 57-60-02.1.

The only project in this state receiving a credit at this time is located at the Antelope Valley Station near Beulah. Basin Electric Power Cooperative owns the Antelope Valley Station that is part of an energy complex that includes the Great Plains Synfuels Plant and the Freedom Mine. Great Plains Synfuels is a commercial coal gasification facility that produces synthetic natural gas resulting in the production of carbon dioxide, which is transported to Canada for sequestration.

A facility that achieves a 20 percent capture of carbon dioxide emissions is entitled to a 20 percent reduction in the general fund share of the coal conversion tax. The facility may receive an additional reduction of 1 percent for each 2 percentage points of captured carbon dioxide emissions up to a maximum tax reduction of 50 percent reflecting an 80 percent capture of carbon dioxide emissions. The tax credit is limited to 10 years from the date the carbon dioxide emissions were first captured or from the date the coal conversion facility became eligible for the credit. The schedule below provides information on the tax credits received and the carbon dioxide captured since 2010, the year in which the tax reduction first became available.

Year	Tax Credits	Average Percentage of Carbon Dioxide Captured
2010	$2.2 million	40%
2011	$2.5 million	36%
2012	$2.9 million	42%
2013	$2.6 million	40%
2014	$3.0 million	41%
2015	$1.9 million	32%
Total	$15.1 million	

CRUDE OIL AND PRODUCED WATER PIPELINE STUDY REPORT

The committee received a report regarding recommendations on the existing regulations for crude oil and produced water pipelines and recommendations on the feasibility and cost-effectiveness of requiring detection and monitoring technology on new and existing pipeline systems pursuant to 2015 House Bill No. 1358.

Energy and Environmental Research Center Report

The committee learned the Industrial Commission contracted with the Energy and Environmental Research Center to compile the information. The committee learned the study has two phases, including a research report to evaluate regulations and pipeline leak detection and monitoring technology as well as a demonstration project to test pipeline technology. According to the report, North Dakota had approximately 12,700 miles of gathering pipelines as of August 2011 and is anticipated to have approximately 36,000 miles of gathering pipelines by the year 2020. The committee learned oil spill volumes relative to total oil production decreased in North Dakota between 2008 and 2014. The report identified that North Dakota had a lower oil spill volume relative to total oil production in 2014 than New Mexico and Texas.

Contained oil and produced water spills are reported to the Department of Mineral Resources while uncontained spills are reported to the State Department of Health. Since the spills are reported in two separate databases, spill data may be missing or repeated. Industry personnel report the potential cause of a spill, but due to inconsistencies in the reports, categorizing and analyzing the potential causes of spills may not be possible in the current reporting systems.

The precise location of many miles of existing gathering pipelines is unknown because the locations were installed prior to the development of the geographic information system. The location of the existing gathering pipelines can be identified using various types of technology, including magnetometers and ground penetrating radar. Some companies have data on the location of existing gathering pipelines, but most records of older gathering pipeline locations have been lost during mergers and acquisitions or the records do not exist. The committee learned the study did not include an analysis of any potential incentives to encourage companies to locate and identify existing gathering pipelines.

The recommendations in the report relate to infrastructure, leak and spill analysis, materials, construction, maintenance and inspection, monitoring and leak detection, and abandonment. The recommendations include:

- Develop real-time data sharing between pipeline partners.
- Apply new regulations based on successes in other pipeline sectors with adjustments for the specific operating conditions in North Dakota.
- Develop a streamlined method for spill reporting and analysis that can be accessed by multiple state agencies.
- Analyze spill data to determine the root causes of pipeline leaks.
- Evaluate the impact of minimum reporting thresholds for spills.
- Require installation crews to have proper training and independent inspections of pipeline installations.
- Monitor the development of new pipeline products.
- Require a notice of intent prior to the installation of gathering pipelines.
- Consider requiring special pipeline installation methods for environmentally sensitive areas.
- Incorporate some of the construction standards from transmission pipelines into the regulations for gathering pipelines.
- Consider implementing regulations related to hydrostatic testing and the maintenance of pipelines.
- Research low-cost external leak detection technologies.
- Demonstrate the use of unmanned aerial systems for pipeline monitoring.
- Catalog the locations of existing pipelines.

Other Pipeline Information

The committee received information from the Public Service Commission regarding an overview of the pipeline siting process. Title 49 relates to the energy conversion and transmission facility siting process. The 2013 and 2015 Legislative Assemblies streamlined the siting process by allowing companies to install similar infrastructure within a corridor that has already been permitted and by allowing companies to adjust the route within the permitted corridor after providing certification to the commission.

The committee received information from the Department of Agriculture regarding the department's pipeline restoration and reclamation oversight program established in 2015 Senate Bill No. 2271. The Department of Agriculture helps to mediate conflicts between landowners or surface tenants and pipeline companies under the program. The department does not provide legal counsel; however, the program includes landowner education which encourages landowners to evaluate the use of the land, to be aware of the pipeline installation method, and to review the remediation process.

The Department of Mineral Resources provided information to the committee regarding the department's underground gathering pipeline program. The committee learned 2015 House Bill Nos. 1333 and 1358 provided the framework for the program. The department received authorization for 10 full-time equivalent positions to implement the program, and developed proposed administrative rules for underground gathering pipelines. The proposed rules relate to bonding requirements, installation oversight, inspections, reclamation, leak detection and monitoring, and spill response plans. At the time of this report, the proposed rules were still under review by the Administrative Rules Committee.

RETAIL ELECTRICITY SALES REPORT

Pursuant to the committee's assigned responsibilities, the committee received annual reports from the Public Service Commission regarding retail electricity sales meeting or exceeding the state renewable and recycled energy objective. In 2008, 4 percent of retail electricity sales in North Dakota were from renewable energy. The percentage of retail electricity sales from renewable energy increased to approximately 16 percent in 2014 followed by a slight decrease to 15.5 percent in 2015. The state's goal for retail electricity sales from renewable energy is 10 percent. The majority of the renewable energy reflects electrical generation from wind energy. Approximately 40 percent of the megawatt hours of electricity produced from renewable energy is utilized in North Dakota while approximately 60 percent is exported to other states.

WATER MANAGEMENT REPORT

The committee also received a report from the Energy and Environmental Research Center regarding water management in the oil and gas industry. Approximately 150,000 barrels of water are used in the fracturing process for each well. Oil producers also use water in the production phase as part of the well maintenance process with active wells using an average of 30 to 50 barrels of water per day for maintenance. As much as 584 million barrels of water per year may be needed by 2035 for well maintenance according to the report. In comparison, the average daily flow rate of the Missouri River provides enough water to fracture 4,000 oil wells, and the average daily evaporation rate provides enough water to fracture 200 oil wells.

Approximately 94 percent of produced water from oil wells is injected in the Dakota Formation through disposal wells, and the estimated annual volume of produced water is anticipated to increase to 811 million barrels by 2025 and to 1.04 billion barrels by 2035. The number of disposal wells increased from 297 in 2008 to 494 in 2015. The Energy and Environmental Research Center estimates 1,000 disposal wells may be needed by 2025 while 1,500 disposal wells may be needed by 2035.

The Energy and Environmental Research Center is in the process of modeling the Dakota Formation to determine the formation's capacity to handle produced water. The center is also researching the use of other formations for produced water disposal. Concerns about injecting produced water into the Dakota Formation include reservoir pressure, the need to drill through the Dakota Formation to reach the Bakken Formation, and salt build up that hinders the injection of additional produced water.

Based on research in other states, the report indicated the primary reason produced water recycling is not actively utilized in North Dakota is because of the additional costs to implement the process. Produced water recycling is more common in southern states because the fresh water supply is more limited. One oil producer in North Dakota used recycled produced water in the fracturing process. The well's performance was comparable to wells that were fractured using fresh water but the use of recycled water resulted in an additional $250,000 of costs for the oil producer.

OTHER

Technologically Enhanced Naturally Occurring Radioactive Material Disposal

The committee received information from the State Department of Health regarding the disposal of technologically enhanced naturally occurring radioactive material (TENORM). The department commissioned Argonne National Laboratories to conduct a study to determine a scientifically based safe disposal limit for TENORM. The study recommended a disposal limit of 50 picocuries per gram of TENORM for 25,000 tons per year in a special waste landfill. Technologically enhanced naturally occurring radioactive material monitoring across the state is limited because the State Department of Health does not have the resources to conduct detailed monitoring and continuous tracking of oilfield waste containing TENORM. The department imposes penalties for the illegal dumping of waste containing TENORM. The department developed administrative rules related to the proper disposal of TENORM, including permitting of special waste landfills, tracking and reporting waste, and disposal limits.

Soil Reclamation Projects

The committee learned the Department of Mineral Resources spent approximately $310,000 from the abandoned oil and gas well plugging and site reclamation fund on projects at three test sites to study options for reclaiming soils surrounding legacy brine pits pursuant to 2015 House Bill No. 1358. The committee learned the Energy and Environmental Research Center also conducted work on legacy brine pits during the 2015-16 interim. The original goal of the Energy and Environmental Research Center's project was to identify best practices for remediating legacy brine pits. However, the focus of the project changed when the size and characteristics of the impacted area at the project site could not be accurately identified from existing estimates. The research team drilled test wells, conducted soil samples, and mapped the project site to more accurately determine the size and characteristics of the impacted area at the project site. Accurate size and characteristic data are important for determining the best methods of remediation and for estimating the cost of the remediation.