ENERGY DEVELOPMENT AND TRANSMISSION COMMITTEE

EmPower Report to the Committee
October 2020
Chairman Rich Wardner

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VICTORY THROUGH INNOVATION, NOT REGULATION

- State
  - Invest significant research money into CCUS, enhanced oil recovery and lignite as well as research councils, e.g. renewables
    - Approximately $65MM
  - Improve regulatory friendliness and technology use to promote safety and support industry
- Industry
  - Lead Environmental, Social and Corporate Governance (ESG) initiatives
    - Use Grand Farm model to integrate and synchronize efforts among industry, state agencies, the EERC, universities, etc.
    - Invest in iPIPE model to solve for unique challenges within industry
    - Capture, report and document ESG successes and related activities

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BUSINESS FRIENDLY DEVELOPMENT

- Continue educating regulators and legislators on growth requirements
- More effective collaboration between governments at all levels and industry
- Quarterly workgroup meetings
- Perform regulatory review and make recommendations to reduce burdensome regulations
- Modernize workforce training

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INDUSTRIAL PARK AND VALUE-ADDED ENERGY

- PetChem
- Biomass growth
- Data Center
- Monetizing carbon
- Growth incentives
  - Taxes
  - Investment

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PUBLIC EDUCATION AND COMMUNICATION

- Educate communities throughout the state:
  - Industry importance
  - Growth and opportunities

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ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE

- What is ESG* and its $45 trillion impact on equity
- The Opportunity
- How ND can lead
- Private sector and gov't responsibilities

*Not to be confused with fiduciary duties

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TRANSMISSION

- The Challenge
- The Vision
- Coal Creek Opportunity
- Need for federal help

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NEXT STEPS

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EmPower

Growing a More Resilient Energy Sector

NORTH Dakota

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NORTH DAKOTA EMPOWER COMMISSION
STRATEGY DEVELOPMENT • JULY 2020

Contents

Executive Summary

Chairman Wardner,

The ND Department of Commerce as well as EmPower Commission are pleased to join the committee and present a roadmap to achieving the very best for the energy industry in North Dakota. The global economy is changing at a rapid clip and so are consumer preferences. As a result of a transformative evolution on how energy is utilized, purchased, transported and financed, North Dakota is in amazing position to leverage new opportunities and growth. As a leader in many areas of energy production, North Dakota's EmPower Commission will make several recommendations to the 67th North Dakota Legislative Assembly. Leveraging top-notch research, development facilities and subject matter expertise, EmPower will develop an aligned public-private model on funding to sequester and re-use carbon, commercialize research and seek designation for the Energy and Environmental Research Center (EERC)to become a designated research center. With robust private sector involvement, the state of North Dakota will continue to improve its business-friendly culture.

Complementing policy to create business friendliness, the state will work with the industry to grow value-added energy production capabilities, including sourcing private equity and developing infrastructure to support expansion. To ensure that the energy industry is prepared to source equity for both raw and value-added material, Commerce will work with companies throughout the state to create environmental, social and corporate governance (ESG) approaches that enable a more attractive environment for investment.

Simultaneous to creating a more robust energy sector, Commerce will support efforts to educate the public and key stakeholders on industry's growth, value chain and transformation. Equally as important, the state will improve its transmission capacity through working with the Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) to ensure new electricity generation within the state has a place to go.

The EmPower Commission will work with the Executive Branch and North Dakota Legislature to advance these key initiatives. Strategies to achieve appropriate growth and development are included in this report.

Business-Friendly Development

North Dakota is among the most business-friendly states in the nation. As a result of its commitment to industry, the energy sector has enjoyed tremendous private sector investment and growth since 2000. North Dakota remains committed to this trajectory of growth; EmPower will focus its efforts on the following:

More effectively educating regulatory agencies and the legislature on industry requirements

Educating regulatory agencies and the legislature will occur through the fall and into the legislative session. In addition, this will be a continuing process given the rapid evolution of the impact of regulations, short- and long-term forecasts on commodity pricing and private equity requirements within the ESGrealm. This effort will be private sector driven and supported by state government agencies where there is value.

Developing succession planning, continued collaboration among industry partners and state agencies

State agencies are a key ingredient to continuing growth in the energy sector. As the state promotes regulatory friendliness and technology use to promote a safe but robust industrial climate, it must also collaborate more effectively to ensure requirements are met.

Enabling agencies to become part of sector growth solutions

A revitalized EmPower Commission, augmented by Commerce and other state agencies, has created a robust relationship focused on industry growth. Throughout 2019, state government took the lead for attracting a petrochemical industry. Moving forward with a more integrated approach involving industry and public sector leaders will enable more effective growth developments.

Leveraging successful quarterly workgroup meetings with Public Service Commission (PSC) and using the model as a success

Currently, there are several workgroups, such as those with the PSC, offering successful models for workgroups. EmPower aims to identify other workgroups to determine which may be revised to reflect successful processes that occur within state government.

Creating informal advisory committees

Perform a regulatory review and make recommendation to reduce the regulatory burden

A private sector-led subcommittee will be established in the fall of 2020, in conjunction with various state agencies, to identify state government regulations that may be impacting energy growth and development. In addition to identifying regulations that are constraining growth, the committee will recommend policy adjustments that foster ESG stewardship while adding opportunities to the sector. This includes both value-added and raw products deriving from the

energy industry. As industry goes through a reset period, EmPower requests patience and an open mind throughout the process.

Creating unique workforce growth and development solutions

In conjunction with the Workforce Development Council, the EmPower Commission will identify unique workforce training, recruitment and retention policies and programs. The energy sector has highly unique requirements and therefore, it is important to identify cutting edge training opportunities to keep residents of the region trained and prepared to meet workforce demands. The goal through these efforts is to rely less on an out-of-state workforce pipeline while providing well-paying jobs to North Dakotans.

Policy and Fiscal Recommendations

The state has an opportunity to improve the business climate through continued investment in Carbon Capture, Utilization and Storage (CCUS) enhanced oil recovery and lignite as well as research councils, e.g. renewables. In addition, the state will strive to improve regulatory friendliness and technology use to promote safety and more effectively support industry.

Industrial Park and Value-Added Energy

Areas of Interest

North Dakota has an abundance of natural resources which could attract more capital, higher wages and longer-term economic stability if there were more value-added energy opportunities in the state. The EmPower Commission has identified the following areas of interest as it pertains to growing new energy development opportunities:

Petrochemical Facility

Biomass Facility

Datacenter

Selling Carbon

Petrochemical Facility

The global petrochemical industry is projected to reach $944 billion by 2023. There are various types of facilities which can cost $2 billion to construct, or large state-of-the-art campuses which can reach over $10 billion. Facilities can produce numerous products from plastics to industrial gases. The commonalities of these facilities are they all have a large power requirement, use large quantities of water and require large storage capacity.

Commerce has done extensive work researching this area, including infrastructure requirements, market trends, economic costs and benefits of a facility to the state, as well as policies/incentive analyses and comparisons with other states that have a prominent petrochemical sector. An update about the effects of current trends would be beneficial to identify any strategic changes that should be made to attract a company under current conditions.

Challenges or Issues

North Dakota is ideal for petrochemical development; however, many challenges exist.

Petrochemical companies consider North Dakota a greenfield site because there is no existing petrochemical industry here and much of the associated infrastructure would need to be built to support the industry.

There are many mature petrochemical clusters that we compete against for investment, including Texas, Louisiana and Alberta, Canada. In these locations, infrastructure currently exists or is less expensive to create and incentives exist to encourage brownfield expansion.

Trained workforces in place to accommodate growth and development place North Dakota at a disadvantage for recruitment.

Although ethane is a byproduct of natural gas, which is a byproduct of oil production, capturing adequate feedstock to support facility operations does not come without challenges.

The global economy is in recession and many companies are not moving forward with plans to expand petrochemical production.

Where and How Many Facilities

Preliminary estimates indicate that there is adequate gas to support multiple petrochemical production facilities and support existing projected midstream infrastructure plans.

Industry partners prefer to cluster around road, rail, salt caverns, water and feedstock pipelines as economies of scale are realized with shared infrastructure. Proximity to feedstock is paramount; as such, given a requirement for infrastructure and feedstock, western North Dakota appears to be the most geographically viable location for the development of an industrial park to accommodate this industry. Economic benefit, however, would be realized throughout the state.

There is potential to convert existing brownfield sites within the energy industry to save on infrastructure; analyses can occur for several sites within the central and western regions of the state.

Why is North Dakota Ideal

North Dakota is ideal for a petrochemical industrial complex as it has abundant natural gas with rich ethane content, the ingredients for infrastructure, e.g. salt and water, to support the industry and is consistently looking to reinvent itself and diversify its economy.

Estimates place feedstock for a petrochemical site at highly competitive rates given that a sophisticated market doesn't exist.

As a result, North Dakota is attractive for industry but must understand that significant challenges remain.

What's Required

To realize a largescale investment, the state of North Dakota will likely have to invest significant capital into a petrochemical complex. This would include the requisite infrastructure so that industry can simply plug and play facilities into the industrial park. Industry may also request incentives beyond what is currently available within the existing economic development framework; like Texas- and Louisiana-based incentives.

Biomass/Biofuels Facility

The biomass market is expected to reach $55 billion by 2025. Biomass facilities can use various agricultural products for feedstock that are grown in abundance in North Dakota. Canola, wheat straw and flax, to name a few examples, can all be used as a feedstock and can all be found in the state.

Biomass facilities have been found to reduce waste for a state and make waste management more efficient. They also create a reliable source of electricity. However, the general costs of

these facilities, both new construction and converted spaces can be more expensive than alternative facilities, such as natural gas. They also can have high emission issues that would need to be addressed.

What's Required

To realize its full potential, North Dakota must continue to encourage private equity and awareness to biomass opportunities. Over the last several years, many out-of-state investors were recruited to North Dakota as a result of aggressive economic development efforts. Hundreds of millions of dollars were invested in mid-2020 and almost $2 billion in proposed projects were on the books. Commerce, supported by other state agencies, must continue to be funded appropriately and continue a robust recruitment approach for biomass. Industry augmentation also is critical to this approach given the need for public-private support.

Datacenter Facility

The datacenter market is rapidly growing as the demand for cloud computing services is increasing at an accelerated rate. In the United States, the market is expected to reach revenues of approximately $70 billion by 2024. Companies like Amazon, Facebook and Microsoft, to name a few, are increasing their investments in datacenter construction, while crypto currency mining is becoming larger and more mainstream industry on a global scale.

North Dakota is already home to datacenters of various types. Due to the high heat content that servers produce, the state's cold climate reduces the cost of cooling, making it an attractive destination. North Dakota also has a low likelihood of natural disasters and the availability of space and energy makes it an ideal location for most all datacenter business structures.

What's Required

In January of 2019 Google and Xcel Energy announced they were negotiating on a site for a 300-megawatt data center in Becker, Minnesota. The facility is expected to require over $600 million in capital investment and will be closest mega sized data center to North Dakota. In 2017 alone, the "big five" (Apple, Microsoft, Facebook, Google, and Amazon) spent over $50 billion in data center development driven by increased demand in cloud-based computing and storage. Mega sized data center operators are expected to increase investment by 20% and continue to look for efficient places to operate. North Dakota is positioned to take advantage of upcoming data center investment by leveraging an abundance of energy, cold climate, and low risk of natural disasters.

Historically once a mega data center opens, investment in the facility continues providing employment opportunities for supporting companies. For example, Des Moines Iowa landed a Facebook data center in 2013 and has seen the facility expand four times providing opportunities for local business to support the construction and ongoing operations. Large investments such as these have proven to help expand and diversify local support industries creating additional investment and jobs. In addition, landing large stable data loads will help

consume power locally making North Dakotas electrical infrastructure more efficient benefiting all energy stakeholders.

North Dakota has an existing framework to help with the attraction of data centers that only needs slight modification in order to increase the effectiveness. The primary tool currently used is the sales and use tax exemption for enterprise information technology equipment and computer software used in a qualified data center 57-39.2-04.13. This program allows operators, owners, and tenants of a qualified data center a sales tax exemption on information technology equipment, computer software, and other expenses related to constructing and running a data center. Modifications to strengthen this tool include extending the program until 2030, removing the four data center limit, and allowing a qualified data center to be a minimum of 15 thousand square feet to qualify. The second tool that could be leveraged as a marketing piece to help attract data center operators is the property tax exemption for new or expanding business (North Dakota Century Code ch. 40-57.1). In this program, a data center if designated primary sector could receive up to a 5-year abatement on property taxes. Competing states like Minnesota and Iowa have offered up to 20 years in property tax exemptions. Adding "qualified data centers" as an eligible recipient for up to 10 years of property tax abatement will increase the visibility of the program to data center developers.

With the two provided modification to existing programs, electrical utilities and economic developers can form a coalition to create a targeted marketing effort and work together to attract additional data centers with the specific goal of landing a mega data center in North Dakota.

Selling Carbon

With growing trends to reduce emissions, creating ways to generate revenue from carbon would allow the state to capitalize in a new way on our resources. Carbon capture and storage facilities enable many of our energy producers to take advantage of current credits (45Q) while also finding new purchasers of carbon. Carbon is utilized in a multitude of industries and processes, from water treatment (which is done here in the state) to the plastics and health care industries. Being able to take CO2 from our high-producing facilities, which is considered an unwanted externality of production, and using it in a beneficial way not only generates revenue but eliminates the nuisance of its production to help keep us ahead of trends and possible future policy.

Carbon capture and storage technologies are becoming more advanced and economically efficient. Carbon credits can be used in conjunction with these technologies to make them more economically viable. There are already various carbon capture technology projects in the state in various stages of completion and targeting carbon being produced from different sources. North Dakota can take the lead in this arena while making many of our energy subsectors more

resilient through diversifying revenue streams and limiting their exposure to policies that may target emissions in the future.

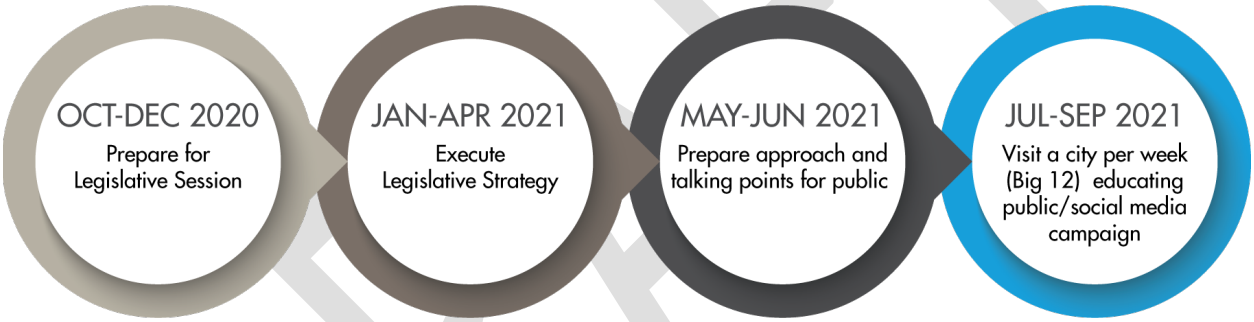
What's Required

As this concept matures and technologies become available, e.g. Project Tundra, North Dakota will be in a better position to examine options moving forward.

Public Education and Communication

EmPower has a great opportunity to develop a cohesive message and educate stakeholders, as well as the public, on its efforts to grow the energy sector. In addition, focusing on how the entire state connects to the energy industry is paramount to the success of this marketing push. Examples include, but are not limited to, agricultural nexus points to energy, inexpensive access to energy, and the number of direct and indirect jobs and industries that are interconnected with the sector. Equally important, it is critical that the public and legislators understand the value chain associated with energy production. A synergistic approach to communication will enable the public to understand the energy's impact on North Dakota.

This effort will be particularly critical going into the next legislative session and beyond. As the energy industry prepares its legislative engagement strategy, it should also focus on transitioning to public education in the spring of 2021. Below is a timeline:



Environmental, Social and Corporate Governance

The "So-What"

In January 2020, Larry Fink, CEO of the world's largest investment fund BlackRock, shocked the investment world in his annual letter to shareholders indicating that the $7 trillion under management would invest only in companies that put sustainability and climate at the center of its investment approach.[1] Simultaneous to this, just about every Fortune 500 company and major private equity firm in the world adopted similar ESG policies as part of their investment strategies. In fact, the ESG investment portfolio is worth about **$30 trillion**, more than the entire Standard and Poor's Index. [2] This number is projected to increase as consumer preferences evolve. Private equity is moving into new standards-based investment practices; energy producers, processors and companies along the value chain are subject to these new requirements.

How ESG Works

Energy markets were the first to be impacted by evolving ESG investment standards. With energy representing the largest industry in the state, it is critical to get ahead of these trends to ensure long-term financial stability for the industry. Across the value-chain, ESG standards with an emphasis on an environmentally sustainable approach must be met to capture private investment. Allianz, a global insurance and investment firm, screens EVERY insurance or investment transaction for ESG compliance. With more than $1 trillion in investment asset management, Allianz created a flow chart to reflect how investment decisions are made. [3] The red box is what the energy industry must avoid.

[1] Letter
[2] Guide
[3] Allianz

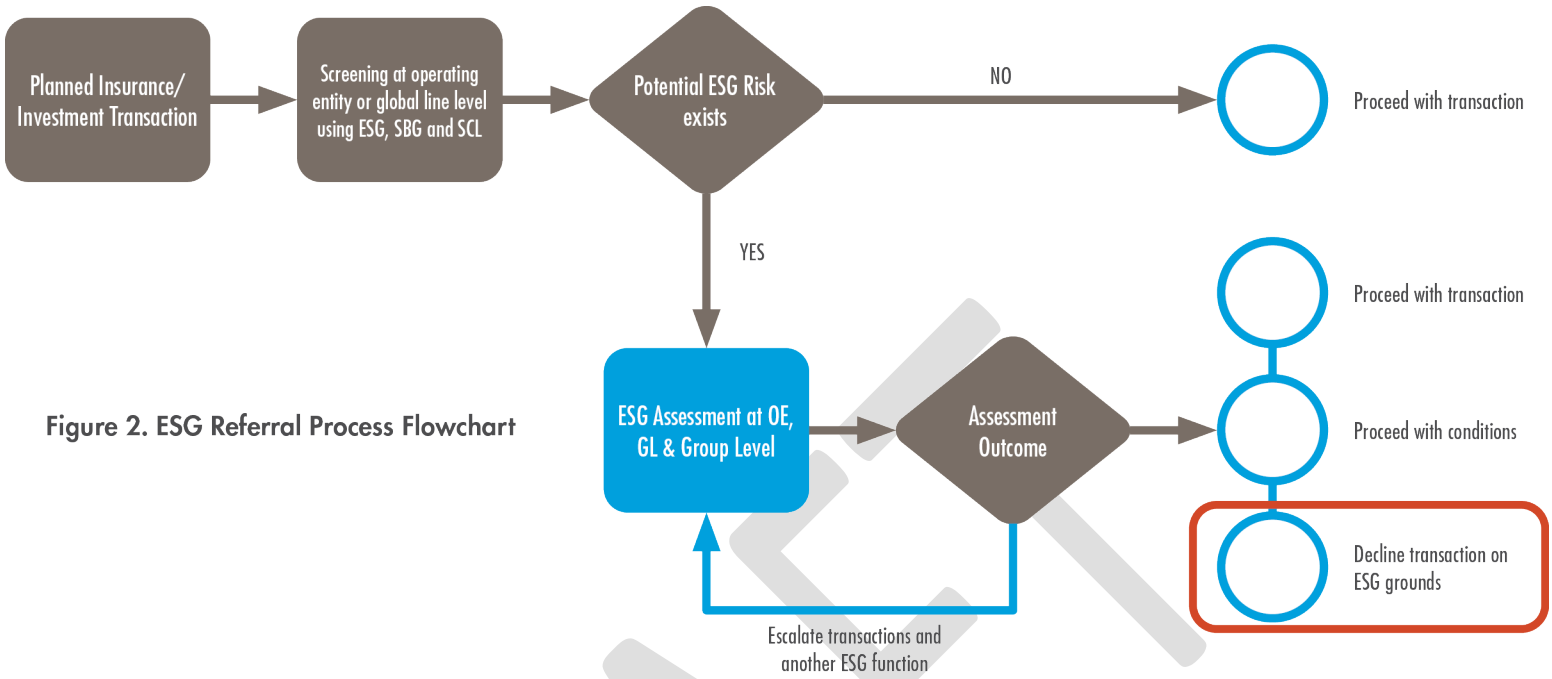


Figure 2. ESG Referral Process Flowchart

The Opportunity

According to Bank of America, 60% of companies feel their investments can influence society and 50% consider ESG policy when making investment decisions.[4] Companies like PepsiCo have gone as far to source over 80% of their raw and value-added product from ESG compliant sources.[5] This is important to highlight as energy sources impact the total score thereby impacting other industries and their decisions to purchase North Dakota-produced energy. It is anticipated that these numbers will grow higher as the world exits the COVID-19 pandemic. Energy producers and those along the value chain have an opportunity to rethink their business strategies to meet private equity demands, grow their companies, mitigate risk, improve returns on investment and bolster supply chains. In turn, communities and companies in North Dakota can become more economically diverse and resilient.

EmPower Value Proposition

Growth

1. Use ESG policies to develop new customers and market share.
2. Gain continued access to private capital through ESG programs.
3. Develop a value-driven network that enables long-term business development.

[4] BofA
[5] Pepsico

Managing Risk

1. Reduce exposure to energy supply risks through addressing ESG issues, compliance and regulatory requirements.

2. Set an example for the nation through the development of leadership skills and an industry culture that adapts to rapidly evolving political and economic trends.

Return on Investment

1. Improve human capital management by attracting and retaining ESG managers and motivated employees.

2. Build pricing power through the development of a solid reputation and brand loyalty.

3. Enhance operational efficiency through the improvement of environmentally sustainable practices such as improving the use of energy, water, waste and raw materials.

The Deliverables

Energy

1. Identify areas for more ESG compliant investment to improve readiness for impactful and long-term private equity investments.

2. Find opportunities for more innovative energy technology use to reduce waste, mitigate impact on the environment and encourage more sustainable energy production methods through the connection to federal programs, public private partnerships and innovation platforms/entrepreneurs.

Supply Chains

1. Create more resilient energy supply chains.

2. Identify alternate transport and logistics networks to mitigate exposure to freight movement disruptions and/or export restrictions.

3. Find and reduce chokepoints that inhibit rapid transitions from commercial or retail demand, should energy consumption patterns become erratic thereby strengthening economic resilience for North Dakota.

The How

The EmPower Commission and Commerce can create an ESG economic resilience and diversification strategy that will be researched, synthesized and delivered over 12 months.

Months 1-2:

· Meet with key stakeholders to include targeted industries, entrepreneurs, communities, community groups, state agencies as well as other key entities to create buy-in.

Months 3-6:

· Identify path-dependence, key hazards, exposures to risk (macroeconomic and microeconomic), vulnerabilities, causes of system shock, shock resistance, etc.

· Classify dependencies within economic and supply chain systems

· Determine measures of regional economic performance

· Collect workforce and supply chain data regarding targeted industries

· Perform environmental scans of existing infrastructure.

· Analyze workforce trends for region, as well as education systems to support long-term labor pipeline.

· Collect input from targeted industries, communities, entrepreneurs, government and quasi-government institutions.

Months 7-8:

· Analyze data

· Create economic systems maps

· Map workforce needs against existing and projected offerings

Months 9-10

· Develop feasible solutions to mitigate risks and diversify economy

· Create recommendations

· Work with public and private partners to create internal buy-in

· Generate achievable metrics and milestones for partners

Months 11-12

· Educate partners on results

· Offer plan to private sector partners so they can use it to encourage private sector investment.

Transmission

North Dakota can produce, market and sell much more energy; both for statewide consumption as well as outside of the state. To accomplish this goal, the state must continue to work with the SPP and MISO to ensure that the power that is produced can be transmitted and sold. In addition, transmission requires a long construction process, including large lead times, to include both permitting and construction. In addition, there must be adequate and long-term funding in place to meet these requirements. CapEx will be very important moving forward as well.

Setting a Vison for Electric Transmission Needs for North Dakota as we go Into the 2020s

In 2020, an evaluation of power flow in the high-voltage transmission grid in North Dakota showed that the transmission system is utilized heavily and quite uniformly across the state. Expected growth of demand both in North Dakota and for export to other areas can be expected to exceed capabilities in several areas within a few years. Also, during the last year, studies that were made on behalf of generation interconnect requests in the state revealed that costly improvements would be needed to add generation within North Dakota. Many of the costs applied to these interconnects are a result of transmission grid deficiencies in other states.

In 2020, the impact of changing expectations for carbon-free and renewable energy became very apparent in North Dakota when Great River Energy announced its intent to shut down Coal Creek Station in August of 2022. Its plan is to replace the energy with wind energy. This decision is very impactful to North Dakota as in 2019, when 42.7% of energy exported from North Dakota was generated and transmitted to Minnesota via the Direct Current (DC) line from Coal Creek Station to Delano, Minn. For North Dakota's future in generation export, it is important that the DC line be retained as part of the North Dakota transmission grid.

Finding another entity to take ownership and continue to operate Coal Creek Station is a large task and recognized by many as a high priority "economic development" or economic retention project for North Dakota. The challenges of reapportioning more than 1,000 megawatts of generation into the area market within a two-year period needs to receive the attention and consideration of a new entity deciding to locate in North Dakota.

The pressure to "modernize" the grid that is driving Great River Energy and others to make decisions to shut down coal fired generation can on the contrary be viewed as an opportunity for North Dakota to become a leader in how to diversify the operation of our lignite fired generation. North Dakota plants in general can operate for decades to come if we do the right things. Evaluating addition of carbon capture systems is well along for both Coal Creek Station and the Milton R. Young Station. By adding these systems, carbon-free electricity can be delivered to the grid within a few years.

Another attribute that the future grid will need is storage to shift renewable energy from time of generation to time of consumption. There are parties interested in developing large storage capability in North Dakota. This is an additional installation that could be added at the Coal Creek Station site. By storing energy when market prices are low and generation when prices are higher, the profitability of such an installation can be enhanced. Also, operation of the storage can increase the utilization factor on the DC transmission line to improve profitability of operating the line. The storage can also be operated in conjunction with Coal Creek Station during ramp-up to improve the ability of the plant to meet higher ramp rates when the market demands.

In summary, EmpowerND can enhance the future of energy production in North Dakota with the following:

Give the future owner of Coal Creek Station every form of support that would be given to a startup business in North Dakota so it can continue the conventional operation long enough to see the advantages and opportunities of what North Dakota can do to respond to grid demand for more carbon free and renewable generation.

Continue support from the state to pursue installation of carbon capture systems on North Dakota generation facilities.

Support the future of the DC transmission line from Coal Creek Station to Minnesota by minimizing barriers to fully utilizing the line for a combination of conventional generation, carbon-free generation, renewable generation and electrical storage.

Work with the legislature and the governor on business climate and tax structures that can contribute to success of these changes.

Encourage the federal delegation from North Dakota to enhance the 45Q tax credit legislation to provide certainty that is required to develop a successful carbon capture business within North Dakota plants.

Timeline and Moving Forward

EmPower will move quickly over the next several months to prepare for informing the Executive Branch and legislature in the next session. Work groups will continue to meet to inform this report through July and August. This document will be converted from a framework and into a playbook and state strategy for moving into session and beyond. By early October, this strategy will be socialized among key stakeholders to ensure EmPower is prepared to meet its legislative objectives.