2025 SENATE ENERGY AND NATURAL RESOURCES
SB 2360

#### 2025 SENATE STANDING COMMITTEE MINUTES

#### **Energy and Natural Resources Committee**

Peace Garden Room, State Capitol

SB 2360 2/6/2025

Act to provide for a legislative management study regarding geothermal energy.

3:00 p.m. Chairman Patten opened the hearing.

Members present:

Chairman Patten, Senators: Beard, Boehm, Enget, Gerhardt, and Van Oosting. Vice Chairman Kessel absent.

#### **Discussion Topics:**

- Geothermal permits
- Geothermal projects
- Temperature logging program
- Nearby developments
- High-temperature formations
- Renewing resource
- Major cost factors and obstacles
- Goals of the study
- Economy security
- Steady energy supply

3:00 p.m. Senator Hogan introduced the bill and submitted testimony in favor #35468 and #35469.

3:02 p.m. Jessica Eagle-Bluestone, Policy Team, Geothermal Rising, testified in favor and submitted testimony #35704.

3:06 p.m. Ned Kruge, Geologist, Department of Mineral Resources, testified in favor and submitted testimony #35539.

3:14 p.m. Alamooti Moones, CEO, GeoTinkers Inc., testified in favor and submitted testimony #35715.

3:21 p.m. Jensen Paul, Citizens Climate Lobby, Green Way Energy LLC, testified in favor and submitted testimony #35466.

#### Additional written testimony:

Cara Artman submitted testimony in favor #33347.

Johanna Ostrum, Gradient Geothermal of Geothermal Developers, submitted testimony in favor #35350.

Senate Energy and Natural Resources Committee SB 2360 2/6/2025 Page 2

William D. Gosnold submitted testimony in favor #35387.

Rebecca Le. Phillips, Citizens Climate Lobby, ND Chapter, submitted testimony in favor #35934.

Tyler J. Hamman, Energy and Environmental Research Center, submitted testimony as neutral #35954.

3:23 p.m. Chairman Patten closed the hearing.

Kendra McCann, Committee Clerk

I support SB 2360

We must do everything we can to prepare for the future and get in on the ground floor of new energy solutions.

Not doing so will only cost everyone in the future, with our lives and with our dollars.



#### Testimony in Support of North Dakota Senate Bill 2360 Johanna Ostrum, Gradient Geothermal February 6, 2025

Chair Patton, members of the committee, thank you for the opportunity to provide testimony in support of Senate Bill 2360. My name is Johanna Ostrum, and I am the Chief Operating Officer of Gradient Geothermal, a company dedicated to advancing geothermal energy development in North Dakota and beyond. I strongly support this bill, which calls for a legislative management study of geothermal energy in the state.

North Dakota has long been a leader in energy production, leveraging its abundant natural resources to drive economic growth and energy security. As the energy landscape evolves, it is critical to explore all viable options for maintaining North Dakota's leadership role while ensuring long-term sustainability and economic resilience. Geothermal energy represents a significant opportunity to diversify the state's energy portfolio, create new job opportunities, and provide a reliable, emissions-free power source that complements existing industries.

A legislative study of geothermal energy is a necessary first step toward unlocking this potential. While North Dakota's subsurface resources are well-mapped for oil and gas production, additional research is needed to assess the feasibility and best practices for harnessing geothermal energy within the state. A comprehensive study would provide valuable insights into the state's geothermal potential, regulatory framework, and economic benefits, positioning North Dakota as a leader in an emerging energy sector.

My company, Gradient Geothermal, is actively deploying geothermal technology in oil and gas fields, demonstrating how existing infrastructure can be harnessed to generate geothermal energy that also provides value for oil and gas operators.

Geothermal energy is produced every day in this state from oil and gas wells. This heat is simply radiated into the atmosphere right now. Our work in North Dakota, with Enerplus and Chord Energy and partially funded by a Clean Sustainable Energy Authority Grant, has shown that geothermal coproduction from oil and gas wells is not just theoretical—it is practical, cost-effective, and can be easily integrated into horizontal well development. A legislative study would help identify ways to support such initiatives and encourage investment in geothermal projects.

Repurposing idle or shut-in oil and gas wells for geothermal energy provides a second life for these existing assets, transforming them into productive energy sources instead of liabilities. Many wells that are no longer viable for oil and gas production still have the necessary subsurface heat to generate geothermal power. This approach reduces the environmental impact associated with well abandonment and creates a new revenue stream for well owners, while maximizing the value of previous energy investments.

In addition to economic benefits, geothermal energy development aligns with North Dakota's commitment to energy innovation and responsible resource management. By studying geothermal



potential, the state can proactively develop policies that foster growth, attract industry investment, and ensure that North Dakota remains at the forefront of energy leadership.

I urge the committee to support Senate Bill 2360 and recognize the importance of this study in shaping the future of North Dakota's energy landscape. Thank you for your time and consideration. I am happy to answer any questions the committee may have.

Johanna Ostrum

COO, Gradient Geothermal

Johanna Ostrum

Honorable Representatives of the State of North Dakota,

I am William D. Gosnold, Jr., Chester Fritz Distinguished Professor at the University of North Dakota in Grand Forks. I hold a bachelor's degree in physics with a minor in geology and a doctorate in geophysics. My research interests include heat flow from the Earth's interior, which finds applications in the thermal maturity of oil and gas, geothermal energy, and Earth's climate. I have collaborated with the US Department of Energy and state geological surveys to conduct geothermal resource assessments in North Dakota, South Dakota, Nebraska, and Minnesota. From 2010 to 2015, I partnered with scientists at Southern Methodist University, the Arizona Geological Survey, Texas Christian University, and the US Department of Energy to develop The National Geothermal Data System. The University of North Dakota has researched, compiled an outstanding database, and conducted numerous focused projects on developing North Dakota's geothermal resources with the support of excellent resources from the Oil and Gas Division of the North Dakota Industrial Commission and the North Dakota Geological Survey. The geothermal resources consist of hot water within the same sedimentary rocks that yield oil and gas, and the infrastructure required to harness geothermal energy is similar, if not identical, to that used for oil and gas production. The potential for geothermal energy development is vast, but this energy supply is renewable, unlike oil and gas.

The quantity of thermal energy stored in the Williston Basin is estimated to be 28 EJ (6.8 PWh), which exceeds the energy in oil and gas reserves in the Basin, i.e., 3.6 PJ (9.97 TWh) (EIA, 2020), by four orders of magnitude. One EJ (exajoule) is  $10^{18}$  joule, and one PW (petawatt) is  $10^{15}$  watts. Although a barrel of oil contains thousands of times more energy than a barrel of water at 150 °C, it can be produced only once. Geothermal heat mining at the scale we envision, with looping injection and production wells, can produce tens of barrels of water per minute. With good reservoir management, such a system can generate power for 20 to 30 years before new wells are needed. However, because the heat is conducted from the Earth's interior, a geothermal field will recover over time and can be redeveloped as a renewable resource.

In 2016, UND partnered with Continental Resources, Calnetix, and the US Department of Energy to demonstrate that geothermal electricity can be produced using oil-field infrastructure. Our analysis using the National Renewable Energy Laboratory (NREL) Cost of Renewable Electricity Spread Sheet (CREST) model found the cost to be \$0.06 per kWh for that application. Using the existing infrastructure, there was no cost for exploration, drilling, or pumping. Including those costs raised the LCOE to \$0.08 to \$0.12 per kWh. The amount of electricity generated by the Calnetix machines was 250 KW. A later collaboration with the Swedish company Climeon found that their machine could generate 1 MW with the same fluid flow. My point is that technology is improving, and the cost of geothermal energy is decreasing.

I have two final points. The first is that electrical power and direct-use geothermal systems can be developed. Distributed geothermal power plants, with capacities ranging from 1 to 10 MW, can operate independently from the power grid and are safe from grid attacks. Using existing

technology, the direct use of geothermal energy for space heating can provide all of the state's heating and cooling needs.

The second point is that it will require a new industry. The petroleum industry is profitable in producing and selling oil and gas. Several oil companies have geothermal divisions, but their business primarily focuses on producing essential oil and gas. In 2016, I collaborated with scientists at NREL to address questions about why geothermal energy in the oil patch has not been developed. We identified that the challenges are economic, particularly concerning the economy of scale compared to petroleum and fossil fuel-based power plants.

Thank you for reading my comments supporting the development of geothermal energy. I welcome any questions and comments.

William D. Gosnold, Jr. Chester Fritz Distinguished Professor University of North Dakota Testimony of Paul Jensen, President of Green Way Energy, Fargo, ND

In support of study bill SB 2360 for the following reasons.

Dear Chairperson and members of the Energy and Natural Resources Committee

I am Paul Jensen, President of Green Way Energy, LLC in Fargo North Dakota, which has been in operation since 2011 and specializing in alternative fuels for transportation such as compressed natural gas systems for vehicle fueling and electric vehicle charging systems.

I stand before you today to voice my unwavering support for Senate Bill 2360, which calls for a thorough legislative study on the development of geothermal energy in North Dakota. This initiative goes beyond being just a study – it serves as a strategic opportunity to place North Dakota at the forefront of America's energy transformation.

#### Geothermal energy,

- is a clean and abundant resource for production of reliable electricity generation
- is included in energy sources under the Trump Administration's Emergency Energy Policy as stated on January 20 of 2025.
- has no harmful emissions associated with proper operation of geothermal wells
- is dispatchable energy when converted to electricity, to serve as baseload and as an intermittent energy source supporting peak loads on the grid
- can interconnect at medium voltage and high voltage power levels through the application of steam turbines and connected generators into existing substations
- has the capability to offset project expenses by up to 40%, by utilizing existing depleted and abandoned oil and gas wells in the state
- can heat and cool large public buildings throughout the year with no variation in energy output.
- has the potential to provide good paying and reliable jobs for citizens throughout the state but in particular the Williston Basin for high output systems
- has the potential to be a reliable energy source for many municipalities, industries, households, and farms for decades of time before major system overhauls
- can be an important and reliable energy source for new data processing centers

To further the economic growth of our state I urge you to pass this Bill so that Dr. Moones Alamooti and her colleagues at UND, together with private business, can identify our opportunities more precisely and help implement this abundant and unlimited energy source. I ask that you vote a pass for this bill.

## Testimony SB 2360

# Senate Energy and Natural Resources Committee Senator Kathy Hogan February 6, 2025

Chairman Patton and members of the committee, Senate Bill 2360 is a bill that I was asked to introduce by a constituent.

After a brief discussion regarding the possibility of developing geothermal energy as another option to our "all of the above" approach to energy development, I did a cursory review of this topic. There is a lot of information regarding this new movement. Here is a good link with background information <a href="https://www.energy.gov/eere/geothermal/electricity-generation">https://www.energy.gov/eere/geothermal/electricity-generation</a>

Geothermal balances both reliability with a reduced carbon footprint in a potentially major new approach. Because of North Dakota's over fifteen-year history with fracking and our stable, well-documented geological structures, ND may be a new frontier for geothermal energy.

There are several people who know much more about this emerging idea. I am more than willing to answer any questions. Thank you for considering this study resolution.



Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

## Geothermal Energy?

#### **Fast Facts**

**Renewable:** Geothermal power plants around the world are still running after 50+ years. And geothermal heat has been used throughout human history!

**Reliable:** Geothermal is always available, regardless of weather conditions.

**Clean:** Geothermal emissions are as low as solar, wind, and hydropower.

## GEOTHERMAL

"Farth"

"Heat"

Literally "heat from the earth," geothermal energy is a renewable energy heat source found under the surface of the earth.

Geothermal energy from deep wells is converted to clean power. The cooled water is reinjected into the reservoir.

Geothermal energy is visible on the surface as volcanoes, geysers, or hot springs.

> A geothermal heat pump circulates water through pipes buried in the ground, or submerged in a water body, to heat and cool a building's HVAC system.

Reinjected water can replenish the geothermal reservoir.

Heat from the Earth is brought up to the surface in the form of hot ground water and steam.





**SB 2360 February 6, 2025** Senate Energy & Natural Resources Committee **Testimony of Ned Kruger** 

Introduced by Senators Hogan, Cory, Patten

A BILL for an Act to provide for a legislative management study regarding geothermal energy.

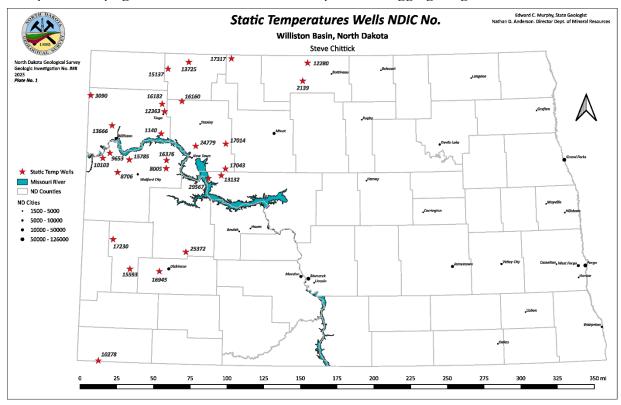
The Geological Survey Division of the Department of Minerals Resources is charged with the duty of enforcing regulations and orders of the Industrial Commission applicable to geothermal energy extraction facilities, while encouraging and promoting the proper use of geothermal resources, and since 1984 has regulated Geothermal Resource Development under North Dakota Century Code Chapter 38-19 (NDAC 43-02-07 for shallow geothermal installation projects). Under this program, the NDGS has issued 1,936 permits. Of those 600 have been for commercial properties and 1,338 have been residential. A typical well field of vertical loops will range from 3-10 well-borings for residential systems and from the tens to hundreds of borings for commercial systems. These loops are generally installed to depths of 200-300 feet. Cumulatively more than 41,000 holes and over 8,600,000 drilling feet of loop depth have been permitted.

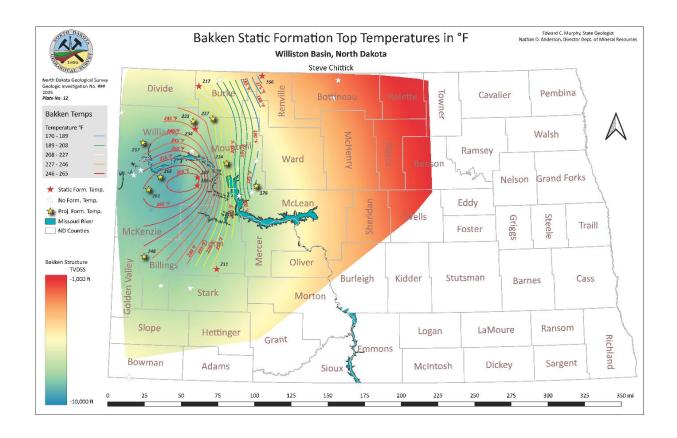
In anticipation of future interest in deep geothermal power production facilities within the state utilizing wells measuring thousands of feet in depth, the NDGS promulgated a new chapter of Administrative Code (43-02-7.1) in 2020. To date no permits have been issued under this chapter. We are however, monitoring the developments of DEEP Energy Production Corp. which has drilled deep geothermal production wells as nearby as two miles north of the US-Canadian border near the town of Torquay, Saskatchewan, from which it has measured water temperatures as high as 261°F (127°C) in the Deadwood Formation. It should be noted that the deepest portion of the Williston Basin, where temperatures are expected to be the highest, is in North Dakota.

In 2014, the NDGS initiated a temperature logging program in the Williston Basin. The primary goal of the program is to gain further insight into the thermal history of the basin that may result in the development of improved models for use in exploration for oil and natural gas. The program has also been designed to gather data useful in the evaluation of the geothermal potential of the Williston Basin. The NDGS has recorded temperatures of 297 and 299°F (147 and 148°C) at depths of approximately 13,000 feet (3,962 m) within the Interlake and Stony Mountain Formations, respectively in McKenzie County. These temperatures were obtained 1,700 to 1,800 feet (518 to 549 m) above the Deadwood Formation at those locations. This program has generated multiple reports and temperature gradient maps of various formations.

The Department of Mineral Resources is supportive of SB 2360.

Examples of maps generated from the NDGS Temperature Logging Program.







ND Senate Energy and Natural Resource Committee Hearing February 6, 2025

Testimony of Jessica Eagle-Bluestone, Geothermal Rising, on <u>Senate Bill No. 2360</u>

North Dakota Sixty-Ninth Legislative Assembly

Chairperson and Members of the Committee:

My name is Jessica Eagle-Bluestone, I'm a North Dakota resident and member of the Mandan, Hidatsa and Arikara Nation. I am here to support Senate Bill No. 2360, which calls for a study on the feasibility of developing geothermal energy in North Dakota. As a geologist with experience in North Dakota's oil and gas sector, I understand the state's subsurface resources and their potential for energy development. In my current role with Geothermal Rising, the world's oldest geothermal non-profit association, serving as the main professional and educational organization for the geothermal community in the United States, I work to advance geothermal energy as a reliable and scalable resource.

North Dakota has long been an energy leader. This study presents an opportunity to evaluate how geothermal energy can strengthen energy security, create jobs, and drive economic growth while utilizing our state's skilled workforce and expertise.

Geothermal is a reliable, baseload energy source that delivers 24/7 power generation, providing a stable and predictable energy supply. Unlike intermittent sources, geothermal offers a steady output, making it ideal for long-term energy planning. Beyond electricity, thermal energy networks can provide cost-effective heating and cooling for homes, businesses, and industries across North Dakota.

Adding geothermal to North Dakota's energy mix strengthens energy security and ensures long-term reliability and resilience. By leveraging our existing subsurface expertise and skilled workforce, we can advance this proven energy source while maintaining North Dakota's position as a leader in energy development.

Geothermal energy creates high-paying jobs and provides a direct path for oil and gas workers to apply their expertise in a growing sector. By tapping into North Dakota's skilled workforce, we can accelerate development and ensure local workers benefit from this expanding industry.

At the same time, a clear regulatory framework will give private investors confidence to develop projects here, driving new economic opportunities and keeping North Dakota at the forefront of U.S. energy leadership.



While upfront costs can be higher, geothermal plants last over 30 years with low maintenance and operating costs, making them a smart, long-term investment. Innovations like closed-loop and next-gen geothermal systems are lowering costs and expanding geothermal's reach into moderate-temperature regions.

Additionally, if present, lithium co-production from geothermal brines could significantly accelerate return on investment, further enhancing geothermal's economic potential for North Dakota.

This bill currently contains the phrase "shall consider studying", which does not compel action. To ensure meaningful progress, I recommend changing it to "shall conduct a study" so that North Dakota fully evaluates its geothermal potential.

North Dakota has led the way in energy development. Geothermal is the next frontier. Supporting this study means investing in energy security, job creation, and long-term economic growth.

I urge you to support Senate Bill No. 2360 with stronger language to ensure this study moves forward.

Thank you for your time and consideration. I welcome any questions.

Jessica Eagle-Bluestone Geothermal Rising Policy Team



February 5, 2025 Senate Energy and Natural Resources Committee State Capitol 600 East Boulevard Avenue Bismarck, ND 58505

Distinguished Chairperson and Committee Members,

I am Moones Alamooti, CEO of GeoTinkers Inc., a North Dakota-based startup specializing in energy and geotechnical solutions. I hold a Ph.D. in Geophysics and a second Master's degree in Energy Engineering, both from the University of North Dakota.

I express my strong support for Senate Bill 2360, which proposes a comprehensive legislative study on geothermal energy development in North Dakota. This initiative is not merely a study – it represents a strategic opportunity to position North Dakota at the forefront of America's energy evolution.

#### North Dakota's Unique Geothermal Advantage

Our state possesses extraordinary geothermal potential, particularly within the Williston Basin. With over 30,000 inactive oil and gas wells, we have a pre-existing infrastructure that can be transformed into a sustainable energy network. This transformation presents three primary opportunities:

- 1. Power Generation Through Enhanced Geothermal Systems (EGS)
- The Williston Basin's temperature gradient of 25-50°C per kilometer creates ideal conditions for geothermal development
- Each repurposed well could generate 2-5 MW of electricity
- Allows for energy volumes to be interconnected to Medium Voltage 34.5 69kV or High Voltage 115 -345 kV transmission power lines.
- Converting just 10% of our inactive wells could:
  - Generate 6,000 MW of installed capacity, capable of powering up to 2 million homes (~26,000 kwh annually per home). This capacity significantly exceeds our state's current residential demand, as North Dakota's population is under 800,000. This excess capacity positions us perfectly to support growing industrial needs and export power to neighboring states.
  - Create \$1.5 billion in annual electricity revenues at current wholesale rates
  - o Save \$500 million in well-plugging costs

#### Meeting North Dakota's Growing Data Center Demands

Our state has emerged as a premier destination for data centers, with electricity consumption from these facilities reaching 3,915,720 MWh in 2023 — representing 15.42% of the state's total electricity consumption. Between 2019 and 2023, North Dakota experienced the nation's fastest relative growth in data center energy demand, increasing by 37% (2.6 BkWh). This growth trend is expected to continue, making our abundant geothermal potential particularly valuable for:

- Supporting the expanding data center infrastructure
- Providing reliable, 24/7 baseload power



- Offering sustainable energy solutions that align with corporate environmental goals
- Strengthening North Dakota's position as a leading data center hub

#### 2. <u>District Heating Systems</u>

Drawing from successful international models like Iceland and France, where geothermal district heating has reduced costs by 50%, we can implement similar systems for:

- Educational institutions (University of North Dakota, Bismarck State College, North Dakota State University)
- Municipal facilities in major cities (Fargo, Bismarck, Grand Forks, Minot)
- State government buildings
- Industrial complexes
- 3. <u>Direct-Use Applications</u>
- Agricultural Innovation: Year-round greenhouse operations
- Aquaculture Development: Temperature-controlled fish farming
- Industrial Processing: Paper production, biofuels, and refrigeration

#### **Economic Impact and Investment Strategy**

Other notable states demonstrate the economic potential of geothermal development:

#### Texas Model:

- \$10 million feasibility study attracted \$5 billion in private investment
- Secured \$84 million in Department of Energy funding
- Estimated 20 GW geothermal potential from oil and gas fields

#### Oklahoma Success:

- \$50 million federal pilot investment
- 6:1 return on investment
- \$300 million in economic benefits over a decade

Proposed Investment for North Dakota: A \$5-10 million feasibility study would enable:

- Scientific mapping of optimal geothermal sites
- Comprehensive infrastructure analysis
- Economic modeling for well conversion
- Strategic planning for power generation and heating systems

#### Federal Support Framework

Recent federal initiatives have provided unprecedented support for geothermal development:

1. HEATS Act (H.R. 7409) – Expands federal tax credits for geothermal energy projects, incentivizes private R&D investment, and promotes the use of enhanced geothermal systems (EGS) and direct-use applications.



- 2. CLEAN Act (H.R. 1449) Provides loan guarantees for geothermal development, offers federal grants for exploratory drilling and well repurposing, and supports state-level geothermal infrastructure projects.
- 3. REGROW Act by Senator Cramer: Provides \$25 million for well repurposing
- 4. National Energy Emergency Declaration (January 2025) by President Donald J Trump: Recognizes geothermal heat as a critical domestic resource

#### **Strategic Implementation Plan**

- 1. Immediate Actions:
- Commission a comprehensive \$5-10 million feasibility study
- Establish public-private partnerships with energy sector stakeholders
- Apply for available DOE innovation grants (\$84 million pool)
- 2. Legislative Framework:
- Implement state tax credits for well repurposing
- Mandate geothermal consideration in public infrastructure projects
- Create streamlined permitting processes for geothermal development
- 3. Long-term Development:
- Foster collaboration between oil and gas companies, universities, and energy innovators
- Develop workforce training programs and balance labor availability between oil and gas vs. geothermal
  jobs.
- Create geothermal technology innovation hubs

#### **Economic and Environmental Benefits**

This initiative will:

- Diversify North Dakota's energy portfolio
- Generate substantial private investment and create skilled jobs
- Reduce energy costs for residents and businesses
- Strengthen our state's energy independence
- Support national clean energy goals while maintaining our energy leadership

#### Conclusion

Senate Bill 2360 represents more than a study – it is a gateway to North Dakota's energy future. By leveraging our existing infrastructure, skilled workforce, and natural resources, we can pioneer a new era of sustainable energy development while maintaining our position as a national energy leader. I strongly urge this committee to support Senate Bill 2360 and help launch North Dakota's geothermal revolution.

Thank you for your consideration. I welcome your questions.

Respectfully submitted,

Moones Alamooti, PhD CEO, GeoTinkers Inc.

Email: moones.alamooti@geotinkers.com



North Dakota Chapter 195 69th St SE Hazelton, ND 58544 leebecca@pm.me 701-425-1433/Dr. Rebecca Phillips

February 6, 2025

Dear Committee Members,

#### We support resolution SB2360 and its call for an interim study of North Dakota's geothermal resources and opportunities.

North Dakota has long been an energy powerhouse, yet geothermal energy remains an untapped opportunity. With our state's rich subsurface resources, strong workforce skilled in drilling and energy production, and existing expertise at the University of North Dakota (Drs. William Gosnold and Moones Alamooti), we are uniquely positioned to harness geothermal energy in ways that benefit our economy, energy security, and environment.

A recent report by the U.S. Department of Energy highlighted that sedimentary basin geothermal resources, such as those found in North Dakota, could supply up to 120 gigawatts (GW) of clean energy nationwide—enough to power millions of homes and industries without relying on imports or weather-dependent sources [DOE, 2023].

Geothermal power involves a very small operational footprint, which is an important consideration in protecting the views and vistas in western North Dakota. Geothermal power generation does not emit greenhouse gases yet provides a firm power source.

#### **Geothermal: A Path to Energy Independence & Economic Growth**

Developing geothermal energy in North Dakota could:

- Strengthen Energy Security: Unlike wind and solar, geothermal energy operates 24/7, providing consistent power without dependency on unpredictable weather conditions [EIA, 2023].
- Support Rural & Tribal Communities: Many of North Dakota's low-income and rural areas face energy insecurity. Geothermal direct heating and power generation could provide affordable, local energy while creating good-paying jobs in energy production and infrastructure.
- Protect Natural Landscapes: Geothermal power involves a very small operational footprint, making it ideal for preserving the views and vistas of western North Dakota while providing clean, firm power with no greenhouse gas emissions.

@citizensclimate 🏏 f 🧿 🔽









 Attract Investment & Innovation: Geothermal development has the potential to bring in over \$3 billion in investment nationally by 2030 and support tens of thousands of new jobs in subsurface engineering, construction, and plant operations [Geothermal Rising, 2023].

#### Leveraging Existing Infrastructure: A Win-Win for Industry & the Environment

North Dakota's oil and gas sector has built a world-class workforce and highly sophisticated drilling infrastructure. Both can be strategically repurposed for geothermal energy development.

With over 30,000 inactive oil and gas wells statewide, this presents an unparalleled opportunity to:

- Reduce environmental liabilities from well plugging and abandonment
- Extend the life of existing infrastructure by using geothermal technology to extract heat from depleted reservoirs
- Generate new revenue streams for the energy sector, providing a long-term transition pathway for North Dakota's energy workers [NREL, 2023]

A study by the National Renewable Energy Laboratory (NREL) found that converting just 5% of inactive wells into geothermal systems could generate hundreds of megawatts of clean power, while saving millions in well closure costs [NREL, 2023].

#### Aligning North Dakota's Energy Future with Market Demand

The demand for clean, reliable energy is growing, with more than 40 U.S. utilities setting net-zero carbon goals by 2050. Geothermal energy can help North Dakota remain competitive in the evolving energy economy, ensuring long-term market stability and positioning our state as a leader in nextgeneration energy solutions [INL, 2023].

#### A Call for Action: Advancing Geothermal Exploration in North Dakota

By supporting Senate Bill 2360, we can:

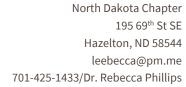
- Conduct a comprehensive assessment of North Dakota's geothermal potential
- ♦ Leverage existing expertise at the University of North Dakota and within the energy industry
- Explore policy incentives that encourage private investment and research partnerships
- Position our state as a leader in emerging energy technologies

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North Dakota has never shied away from energy innovation—and this study is a necessary first step to ensuring we fully evaluate the potential for geothermal energy to strengthen our economy, create jobs, and provide sustainable, locally produced energy for decades to come. This resolution for an interim study of geothermal resources and opportunities is a practical and essential step toward realizing an "all of the above" energy portfolio.

As an organization committed to sustainable energy policies, economic resilience, and climate solutions, we believe this legislation represents a forward-thinking step in strengthening North Dakota's energy leadership while safeguarding its environmental and economic future.

On behalf of Citizens Climate Lobby - North Dakota Chapter, we urge you to support Senate Bill 2360 and move forward with this critical study.

Thank you for your time and consideration.

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#### Energy & Environmental Research Center

15 North 23rd Street, Stop 9018 • Grand Forks, ND 58202-9018 • P. 701.777.5000 • F. 701.777.5181 www.undeerc.org

Chairman Patten, members of the committee, on behalf of the Energy and Environmental Research Center we appreciate this opportunity to offer comments on Senate Bill 2360. As a leading developer of cleaner, more efficient energy and environmental technologies, the EERC supports an all-of-the-above approach to developing energy resources. Over the past several years the EERC has been involved with numerous projects to reduce carbon emissions while ensuring reliability, such as carbon capture technology for fossil-fuel electric generation as well as new and emerging fuels such as hydrogen, and options for energy storage.

At the direction of the legislature, and in conjunction with the Lignite Energy Council, the EERC just completed a study on a lignite plant of the future. That study explored regulatory, financial, technological, and other issues related to construction of a new, lignite-fired power facility in North Dakota. This legislation being heard today would implement a similar review for geothermal energy. As the state of North Dakota explores options for increased energy production, it is important to fully understand the feasibility, costs, impacts, and the role that geothermal might play in North Dakota's energy industry.

We appreciate the legislature's ongoing support of energy innovation and pursuing solutions to environmental challenges while growing our energy sector and its contributions to the state. Thank you again for this opportunity to provide comment.



#### 2025 SENATE STANDING COMMITTEE MINUTES

#### **Energy and Natural Resources Committee**

Peace Garden Room, State Capitol

SB 2360 2/7/2025

Act to provide for a legislative management study regarding geothermal energy.

9:37 a.m. Chairman Patten opened the hearing.

#### Members present:

Chairman Patten, Vice Chairman Kessel, Senators: Beard, Boehm, Enget, Gerhardt, and Van Oosting.

#### **Discussion Topics:**

- Study funding sources
- Depleted oil wells
- Reasons for study
- Geothermal policy
- Private contractors

9:44 a.m. Senator Gerhardt moved a Do Pass.

9:44 a.m. Senator Boehm seconded the motion.

Senators	Vote
Senator Dale Patten	Υ
Senator Greg Kessel	Υ
Senator Todd Beard	Υ
Senator Keith Boehm	Υ
Senator Mark Enget	Υ
Senator Justin Gerhardt	Υ
Senator Desiree Van Oosting	Υ

Motion Passed 7-0-0.

9:44 a.m. Senator Gerhardt will carry the bill.

9:45 a.m. Chairman Patten closed the hearing.

Kendra McCann, Committee Clerk

#### REPORT OF STANDING COMMITTEE SB 2360 (25.1368.01000)

Module ID: s\_stcomrep\_22\_003

**Carrier: Gerhardt** 

**Energy and Natural Resources Committee (Sen. Patten, Chairman)** recommends **DO PASS** (7 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). SB 2360 was placed on the Eleventh order on the calendar. This bill does not affect workforce development.

2025 HOUSE AGRICULTURE SB 2360

#### 2025 HOUSE STANDING COMMITTEE MINUTES

#### **Agriculture Committee**

Room JW327C, State Capitol

SB 2360 3/20/2025

A BILL for an Act to provide for a legislative management study regarding geothermal energy.

8:28 a.m. Chairman Beltz opened the meeting.

Members Present: Chairman Beltz, Vice Chairman Hauck, Representatives Anderson, Dobervich, Henderson, Holle, Hoverson, Kiefert, Nehring, Olson, Rios, Schreiber-Beck, Tveit, Vollmer

#### **Discussion Topics:**

- Reliable energy
- Enhance energy independence
- Reduce carbon footprint
- Abandoned well usage

8:29 a.m. Senator Kathy L. Hogan, District 21, Fargo, ND, introduced, testified and submitted testimony #42982

8:32 a.m. Paul N. Jensen, President, Green Way Energy, LLC testified in favor and submitted testimony #43125.

8:44 a.m. Ned W. Kruger, Geologist, ND Department of Mineral Resources - Geological Survey Division, testified in favor and submitted testimony #43077.

8:53 a.m. Dennis Pathroff, GA Group, Power Companies of North Dakota, testified in favor and submitted testimony #43004.

8:55 a.m. Moones Alamooti, CEO, GeoTinkers Inc., testified (online) and submitted testimony in favor #43167.

8:59 a.m. Jessica Eagle-Bluestone, Geothermal Reising, testified (online) and submitted testimony in favor #43184.

9:04 a.m. Representative Dobervich moved Do Pass.

9:04 a.m. Representative Hoverson seconded the motion.

Representatives	Vote
Representative Mike Beltz	Υ
Representative Dori Hauck	Υ
Representative Karen A. Anderson	Υ
Representative Gretchen Dobervich	Υ

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Representative Donna Henderson	Y
Representative Dawson Holle	Υ
Representative Jeff Hoverson	Υ
Representative Dwight Kiefert	Υ
Representative Dennis Nehring	Υ
Representative SuAnn Olson	Υ
Representative Nico Rios	Υ
Representative Cynthia Schreiber-Beck	Υ
Representative Bill Tveit	N
Representative Daniel R. Vollmer	Υ

Motion passe 13-1-0.

9:06 a.m. Representative Dobervich will carry the bill.

#### **Additional Written Testimomy:**

Tyler Hamman, Energy & Environmental Research Center (EERC), Bismarck, ND, submitted testimony in favor #43155.

Michael Graalum, Dakota Resource Council, submitted testimony in favor #43160.

9:06 a.m. Chairman Beltz closed the meeting.

Diane Lillis, Committee Clerk

### REPORT OF STANDING COMMITTEE SB 2360 (25.1368.01000)

Module ID: h\_stcomrep\_44\_002

**Carrier: Dobervich** 

**Agriculture Committee (Rep. Beltz, Chairman)** recommends **DO PASS** (13 YEAS, 1 NAY, 0 ABSENT OR EXCUSED AND NOT VOTING). SB 2360 was placed on the Fourteenth order on the calendar.

# SB 2360 Testimony House Agriculture Committee Senator Kathy Hogan March 20,2025

Chairman Beltz and members of the committee, Senate Bill 2360 is a bill that I was asked to introduce by a constituent.

After a brief discussion regarding the possibility of developing geothermal energy as another option to our "all of the above" approach to energy development, I did a cursory review of this topic. There is a lot of information regarding this new movement. Here is a good link with background information <a href="https://www.energy.gov/eere/geothermal/electricity-generation">https://www.energy.gov/eere/geothermal/electricity-generation</a>

Geothermal balances both reliability with a reduced carbon footprint in a potentially major new approach. Because of North Dakota's over fifteen-year history with fracking and our stable, well-documented geological structures, ND may be a new frontier for geothermal energy.

There are several people who know much more about this emerging idea. I am more than willing to answer any questions. Thank you for considering this study resolution.



Good morning, Chairman Beltz and members of the House Agriculture Committee,

The Power Companies of North Dakota ("PCND") urges a "Do Pass" recommendation on SB 2360.

PCND is a coalition of the state's leading shareholder-owned gas and electric utilities. Our members include MDU Resources Group, Xcel Energy, Otter Tail Power Company, and ALLETE. Together, PCND members serve over 427,000 North Dakota customers, employ over 1,200 North Dakotans, and manage significant power generation and transmission infrastructure across our state.

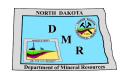
Today, we express PCND's strong support for SB 2360, the legislative management study on geothermal energy.

PCND member companies are committed to exploring all forms of energy production, including geothermal, to ensure the delivery of affordable, safe, and reliable electricity to communities across North Dakota. We look forward to actively participating in this important study and offering our members' expertise to develop practical and effective recommendations.

Accordingly, PCND strongly urges a "Do Pass" recommendation on SB 2360.

Thank you, Chairman Beltz and committee members.





**SB 2360** March 20, 2025 **House Agriculture Committee Testimony of Ned Kruger** 

Introduced by Senators Hogan, Cory, Patten

A BILL for an Act to provide for a legislative management study regarding geothermal energy.

The Geological Survey Division of the Department of Mineral Resources enforces the regulations and orders of the Industrial Commission applicable to geothermal energy extraction facilities, while encouraging and promoting the proper use of geothermal resources, and since 1984 has regulated Geothermal Resource Development (under North Dakota Century Code Chapter 38-19 and NDAC 43-02-07 for shallow geothermal installation projects). Nearly 2,000 permits have been issued for commercial and residential shallow geothermal systems. A typical well field of vertical loops will range from 3-10 well-borings for residential systems and from the tens to hundreds of borings for commercial systems. These loops are generally installed to depths of 200-300 feet where ground temperatures are approximately 45°F throughout the year.

Anticipating future interest in deep geothermal power production facilities utilizing higher temperature wells measuring thousands of feet in depth, the NDGS promulgated a new chapter of Administrative Code (43-02-7.1) in 2020. To date no permits have been issued under this chapter. However, there is a geothermal-power production project underway just several miles north of the US-Canadian border near the town of Torquay, Saskatchewan. There, DEEP Energy Production Corp. has performed test-drilling and measured water temperatures as high as 261°F (127°C) in a sandstone layer of the Deadwood Formation. They anticipate a phase one construction of a 5 MW facility consisting of two injection wells and two extraction wells drilled horizontally to a depth of approximately 3.5 km to be completed in 2026. Phase two construction could add 18 more wells and bring the facility up to 25 MW of power generation. It should be noted that the deepest areas of the Williston Basin, where temperatures are expected to be the highest, are in North Dakota.

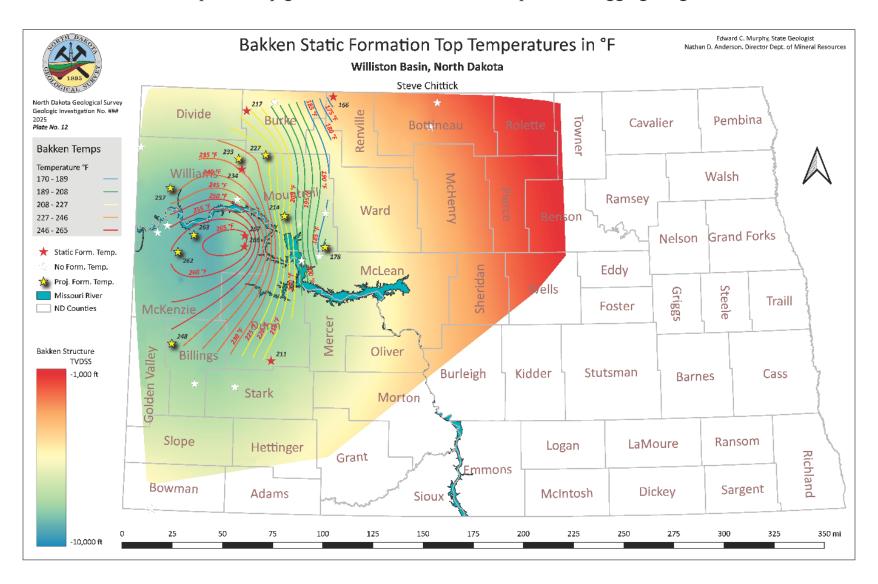
In 2014, the NDGS initiated a static temperature logging program in the Williston Basin utilizing oil wells which were no longer producing but had not yet been permanently abandoned. The primary goal of the program is to gain further insight into the thermal history of the basin that may result in the development of improved models for use in exploration for oil and natural gas. The program has also been designed to gather data useful in the evaluation of the geothermal potential of the Williston Basin. The NDGS has recorded temperatures of 297 and 299°F (147 and 148°C) at depths of approximately 13,000 feet (3,962 m) within the Interlake and Stony Mountain Formations, respectively in McKenzie County. These temperatures were obtained 1,700 to 1,800 feet (518 to 549 m) above the Deadwood Formation at those locations. This program has generated multiple reports and temperature gradient maps of various formations.

The Department of Mineral Resources is supportive of SB 2360.

Mark F. Bohrer ASSISTANT DIRECTOR OIL AND GAS DIVISION

Nathan D. Anderson DIRECTOR DEPT. OF MINERAL RESOURCES Edward C. Murphy STATE GEOLOGIST GEOLOGICAL SURVEY

#### Example of map generated from the NDGS Temperature Logging Program.





Honorable Chairman Beltz and Agricultural Committee members,

Thank you for the opportunity to testify on this important bill which is intended to enhance our state's long-term energy independence and economic competitiveness. The bill aims to pave the road for industries interested in and engaged in leveraging geothermal energy with existing power generators, and to feed power data centers in addition to boosting agricultural productivity. It is noteworthy that geothermal energy is part of the energy independence and sustainability plan, President Trump proclaimed on January 20, 2025.

By having the study develop a roadmap, North Dakota is preparing to efficiently utilize its underground energy while simultaneously repurposing abandoned wells, thereby transforming potential environmental liabilities into assets.

The recap testimonies presented to the Senate Committee, the main revenue element is electricity production. Note that each repurposed well could generate 2-5 MW of electricity. Using just 10% of our inactive wells, our state is expected to generate 6 GW capacity powering up to 2 million households at an annual unit rate of 26,000 kWh.

Globally, geothermal projects have proven successful for many decades:

- **The Geysers, California**: The world's largest geothermal installation producing 1,205 MW from 18 power plants from 350 wells, operational since the 1960s.
- Salton Sea Geothermal Field, California: Over 430 MW capacity from 11 plants, with potential for lithium extraction to support battery production since early 1980ies.
- Coso Geothermal Field, California: A 270 MW power project from 4 power plants running for decades near China Lake Naval Base since the late 1980ies.

The agricultural sector will also benefit from geothermal energy:

- Commercial growers save up to **80% on fuel costs** compared to traditional heating.
- Typical ROI for geothermal greenhouse heating ranges from \$1.50 to \$2.50 per sq. ft annually, with a 3–7-year payback period.
- Geothermal greenhouses extend growing seasons by 2-3 months in cold climates, increasing revenues by 20-30%.
- **Crop quality improves by 15-20%**, with higher nutrient content in vegetables due to optimized growing conditions.



#### Notable examples include:

- Edwards and Flint Greenhouses, Idaho: Annual savings of \$0.85-\$1.20 per sq. ft on heating costs.
- Chena Hot Springs Resort, Alaska: Produces 1,500+ pounds of produce monthly with annual energy savings exceeding \$30,000.
- Burgett Wholesale, New Mexico: Achieves 60–70% lower heating costs in its 13-acre rose facility.

These examples, large and small, demonstrate geothermal energy's potential to reduce costs, boost production, and enhance sustainability. I urge the committee to support this bill thereby attracting future geothermal investments to our state.





15 North 23rd Street, Stop 9018 • Grand Forks, ND 58202-9018 • P. 701.777.5000 • F. 701.777.5181 www.undeerc.org

Chairman Beltz, members of the committee, on behalf of the Energy & Environmental Research Center (EERC) we appreciate this opportunity to offer comments on Senate Bill 2360. As a leading developer of cleaner, more efficient energy and environmental technologies, the EERC supports an all-of-the-above approach to developing energy resources. Over the past several years the EERC has been involved with numerous projects to reduce carbon emissions while ensuring reliability, such as carbon capture technology for fossil-fuel electric generation as well as new and emerging fuels such as hydrogen, and options for energy storage.

At the direction of the legislature, and in conjunction with the Lignite Energy Council, the EERC just completed a study on a lignite plant of the future. That study explored regulatory, financial, technological, and other issues related to construction of a new, lignite-fired power facility in North Dakota. This legislation being heard today would implement a similar review for geothermal energy. As the state of North Dakota explores options for increased energy production, it is important to fully understand the feasibility, costs, impacts, and the role that geothermal might play in North Dakota's energy industry.

The EERC has looked at geothermal opportunities in the state in the past, and we believe that this technology would benefit from the topic areas identified by SB 2360, particularly the application to nonproductive oil and gas wells. While our research to-date has indicated potential, more work remains to demonstrate feasibility and warrant additional exploration.

We appreciate the legislature's ongoing support of energy innovation and pursuing solutions to environmental challenges while growing our energy sector and its contributions to the state. Thank you again for this opportunity to provide comment.



Testimony of Michael Graalum, Clean Energy Organizer, Dakota Resource Council, on Senate Bill 2360

Chairperson and Members of the House Agriculture Committee,

I am Michael Graalum, Clean Energy Organizer for the Dakota Resource Council. I write to you today in support of Senate Bill No. 2360, calling for detailed study of the viability of geothermal power in our state. North Dakota has been a leader in energy innovation for generations, including our early and emphatic adoption of wind-generation, coal gasification, fracking, biofuels, and other technologies. As a result of these previous efforts, our state has been left endowed with many deep wells, trained drillers and support staff, and supporting infrastructure.

This shift of the economics of this technology in our favor makes this an opportunity of high priority, as this source has the potential to provide both baseload power and can be used as a backup for intermittent technologies like wind or solar. This is a carbon neutral technology, which will be essential as this is increasingly a requirement in the large energy markets to which North Dakota exports. As this energy source is highly scalable, reliable and ecologically sound, North Dakota will be able to present a stronger case to potential industrial partners, including data centers, industrial greenhouses, heavy manufacturing, and other uses. It will also be able to provide district heat, as is used in many institutional and neighborhood settings around the state and the world.

Giving this technology the full support of the state will help us reach our goal of an "all of the above" energy policy, provide economic resiliency to our citizens in western North Dakota and turn our burdensome legacy oil infrastructure into an asset. Please support this bill and this potential revolutionary technology.

Michael J Graalum Clean Energy Organizer, Dakota Resource Council Mike@drcinfo.com



March 19, 2025 House Agriculture Committee State Capitol 600 East Boulevard Avenue Bismarck, ND 58505

Distinguished Chairman Beltz and Members of the House Agriculture Committee,

I am Moones Alamooti, CEO of GeoTinkers Inc., a North Dakota-based startup specializing in energy and geotechnical solutions. I hold a Ph.D. in Geophysics and a Master's degree in Energy Engineering from the University of North Dakota.

I strongly support Senate Bill 2360, which will establish a comprehensive legislative study on geothermal energy development in North Dakota, creating a strategic framework to position our state at the forefront of both energy innovation and agricultural advancement.

#### What Senate Bill 2360 Will Deliver

This bill authorizes a comprehensive study that will:

- Map optimal geothermal sites across North Dakota for power generation and direct-use applications
- Develop a framework for repurposing inactive oil and gas wells into geothermal energy systems
- Create regulatory pathways for electricity generation and transmission
- Establish funding mechanisms that leverage federal support opportunities
- Design pilot programs for both power production and agricultural applications
- Assess infrastructure needs for connecting geothermal resources to the grid

#### North Dakota's Geothermal Potential: Power and Agriculture

North Dakota possesses extraordinary geothermal potential, particularly within the Williston Basin. With over 30,000 inactive oil and gas wells, we have pre-existing infrastructure that can be transformed into both a sustainable energy network and an agricultural innovation platform.

#### **Power Generation Through Enhanced Geothermal Systems (EGS)**

- The Williston Basin's temperature gradient of 25-50°C per kilometer creates ideal conditions for geothermal development
- Each repurposed well could generate 2-5 MW of electricity
- Converting just 10% of our inactive wells could:
  - o Generate 6,000 MW of installed capacity, capable of powering up to 2 million homes
  - o Create \$1.5 billion in annual electricity revenues at current wholesale rates
  - o Save \$500 million in well-plugging costs

This abundant clean energy resource creates a unique opportunity to transform North Dakota agriculture through reliable, low-cost power for agricultural operations.



#### **Year-Round Agricultural Production**

Geothermal energy can fundamentally transform our agricultural calendar:

- **Greenhouse Agriculture**: Geothermal-heated greenhouses enable:
  - Year-round production of high-value crops
  - o Extension of growing seasons by 3-4 months annually
  - o 60-75% reduction in heating costs compared to conventional greenhouses
- Controlled Environment Agriculture: Temperature-controlled facilities allow for:
  - o Protection from increasingly unpredictable weather patterns
  - o Significant reduction in water usage (up to 50% compared to traditional farming)
  - Enhanced crop protection from pests and diseases

#### **Agricultural Processing and Livestock Operations**

- Crop Drying and Processing: Direct geothermal heat application reduces energy costs by 30-50%
- Aquaculture Development: Temperature-controlled fish farming operations
- Livestock Facility Heating: Improved feed conversion efficiency and reduced mortality rates

#### Case Studies: Agricultural Success with Geothermal Energy in the USA

#### • Fish Breeders of Idaho (Hagerman, Idaho)

- 150-acre operation using 95°F geothermal water
- 1.2 million pounds of tilapia produced annually
- 70-75% energy savings compared to conventional systems
- 15-18 full-time jobs created
- Source: Geo-Heat Center Bulletin, Oregon Institute of Technology; Idaho Department of Water Resources

#### • Milgro Nursery (Wabuska, Nevada)

- 8-acre greenhouse using 168°F geothermal water
- 4.5 million potted plants produced annually
- \$350,000-400,000 annual energy cost savings
- 60-65% carbon footprint reduction
- Source: Great Basin Center for Geothermal Energy; Nevada Division of Minerals case studies

#### • Imperial Valley Geothermal District (California)

- 15 acres using direct geothermal applications
- 20-25% higher yields compared to conventional farming
- 3-4 month growing season extension
- 40-50% water savings
- Source: California Energy Commission; Imperial Irrigation District renewable energy reports

#### **Economic Impact for North Dakota Agriculture**

Implementation of Senate Bill 2360's recommendations would enable:

- Creation of 1,500-2,000 new year-round agricultural jobs
- Generation of \$250-350 million in annual agricultural revenue
- Reduction of energy costs for existing operations by 40-60%



Decreased dependence on imported produce during winter months

#### Federal Support Available

Recent federal initiatives have created unprecedented support for geothermal development:

- **REGROW Act** by Senator Cramer provides \$25 million for well repurposing
- National Energy Emergency Declaration (January 2025) recognizes geothermal heat as a critical domestic resource
- **Bipartisan Infrastructure Law**: Allocated \$84 million specifically for geothermal energy demonstration projects, with priority for repurposed oil and gas infrastructure
- DOE Frontier Observatory for Research in Geothermal Energy (FORGE) Initiative: Ongoing \$220 million program focused on developing enhanced geothermal systems technologies
- **DOE Enhanced Geothermal Shot**: Recently announced initiative aiming to reduce EGS costs by 90% to \$45 per megawatt hour by 2035
- **DOE Wells of Opportunity Program**: Provides funding for converting existing wells to geothermal use, with \$20 million allocated for 2024-2025 projects

#### **Specific Legislative Actions Needed**

I respectfully request that the committee:

- 1. Vote in favor of Senate Bill 2360 to authorize this critical study
- 2. Recommend appropriation of \$5-10 million for comprehensive feasibility assessment
- 3. Support the specific inclusion of agricultural applications in the study parameters
- 4. Establish an expedited timeline for study completion to capitalize on current federal funding opportunities
- 5. Consider a parallel regulatory review to streamline permitting for agricultural geothermal applications

#### Conclusion

Senate Bill 2360 represents North Dakota's gateway to agricultural innovation and energy leadership. The proposed study will provide the roadmap for transforming our existing well infrastructure into a geothermal resource that powers year-round agricultural production despite our challenging climate.

I urge you to vote in favor of Senate Bill 2360 to unlock North Dakota's geothermal potential for our agricultural future. Your support today will help launch a new era of agricultural productivity and rural economic development for generations to come.

Thank you for your consideration. I welcome your questions.

Respectfully submitted,

Moones Alamooti, PhD CEO, GeoTinkers Inc.

Email: moones.alamooti@geotinkers.com



ND House Committee on Agriculture Committee Hearing March 20, 2025

Testimony of Jessica Eagle-Bluestone, Geothermal Rising, on Senate Bill No. 2360

North Dakota Sixty-Ninth Legislative Assembly

Chairman Mike Beltz and Members of the House Committee on Agriculture:

I am Jessica Eagle-Bluestone, a North Dakota resident and a member of the Mandan, Hidatsa, and Arikara Nation. In my role on Geothermal Rising's policy team, I focus on advocating for the advancement of geothermal development through policy and stakeholder engagement. Geothermal Rising, the world's oldest geothermal non-profit association, serves as the leading professional and educational organization for the geothermal community in the United States.

I strongly support Senate Bill No. 2360, which calls for a study on the feasibility of developing geothermal energy in our state, especially given the growing interest in developing geothermal solutions. Having worked within North Dakota's energy landscape as a geologist, I have seen how our longstanding oil and gas expertise can lay a robust foundation for advancing geothermal energy development.

North Dakota's history as an energy leader is undeniable. Now, we have an extraordinary opportunity to build on that legacy by tapping into our geothermal potential. Our state is uniquely positioned, with a high quality resource and more than 30,000 inactive oil and gas wells that can be repurposed, to develop a reliable, sustainable energy network.

#### Consider these compelling figures:

- A modest 10 MW geothermal facility can generate between 80 and 90 GWh per year, delivering dependable, round-the-clock power to over 10,000 households.
- By repurposing just 10% of our inactive wells, we could install up to 6,000 MW of geothermal capacity. This level of production could power nearly 2 million homes, create substantial new revenue streams, and significantly reduce well-plugging costs.

Geothermal energy offers long-term economic and operational benefits. Facilities typically operate for over 30 years with lower operating costs than many conventional power plants, promising a stable source of jobs and a secure energy future for our communities. Additionally, if present, lithium co-production from geothermal brines could significantly accelerate return on investment, further enhancing the economic potential of geothermal in North Dakota.



I recognize there may be concerns about the upfront costs of geothermal projects. However, federal funding opportunities and long-term operational savings can help offset these initial investments. A clear regulatory framework will also be essential to attract private investors, driving further economic growth and expediting project development.

Importantly, pursuing geothermal energy in North Dakota builds upon, rather than competes with, our petroleum industry. By drawing on our extensive subsurface knowledge, utilizing existing infrastructure, and tapping into an already skilled workforce, we can maximize the value of our current energy industry while securing new avenues for growth.

Senate Bill 2360 is not just a study, it is a strategic investment in our state's future. Funding this study will enable North Dakota to develop policies that unlock our geothermal potential, diversify our energy mix, and solidify our position as a leader in energy innovation.

By transforming existing assets into sustainable, productive energy sources, we can ensure a truly resilient energy future for the people of our state. I respectfully request that you pass Senate Bill 2360 to move from discussion to decisive action and position North Dakota at the forefront of geothermal innovation.

Thank you for your time and consideration. I welcome any questions you may have.

Jessica Eagle-Bluestone Geothermal Rising Policy Team