

Policy Education White Paper – Western North Dakota Energy Project

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This paper was commissioned by the [Bush Foundation](#) through the [Western North Dakota Energy Project](#). Source and supporting documentation noted in the paper as blue hot links to web-based resources.

Executive Summary

Game Changing Event. Bakken-related energy development in Western North Dakota is an unprecedented event in terms of the magnitude and expected duration of development. The region's communities are challenged to support current energy development *and* ensure post-development regional prosperity. Finding solutions to these challenges is of paramount importance. While there is no one right solution, domestic and international experiences provide important insights and models for potential policy and program action.

Mismatch between Challenges and Solutions. The pace, magnitude and duration of energy development have overwhelmed the capacity of the region and State to effectively respond – a common occurrence based on experiences in other energy-impacted regions. These experiences also suggest that solutions generally emerge just as development is peaking, which may be years after the initial impacts are felt. Creating more immediate, predictable and robust solutions is central to “getting ahead of the development curve” and more effectively supporting current development and ensuring future prosperity.

Short-Term Solutions. The short term includes the years of active development and production when overall economic stimulus is high. Two essential policy anchors are important during this period. **One**, to help finance the necessary planning, expertise and development assistance required so that the region and its communities can more effectively support energy-related development, a higher share of all production tax revenue (20 to 40%) should be reallocated to the region and communities of impact in a planned, predictable and aggressive manner. **Two**, planning should begin now to ensure the region's economic diversity and prosperity post-development boom.

Long-Term Solutions. While the short term focuses on the period of active development and production, the long term is forever. As regional capacity and resources are focused on supporting energy development, other core components of the region's economy may be undermined. When energy development winds down, the elements of a post-energy development economy capable of ensuring economic opportunity and prosperity must be in place. Policy actions to address the long term are discussed in this paper.

Legacy Trust Fund. Primary among the policy options to ensure long-term prosperity for the region and State is the creation of a regionally-focused Legacy Trust Fund. Such a commitment and mechanism would be capitalized from current energy tax revenues, helping to ensure that long-term development solutions and investments are put in place. There are powerful models that could be used to shape mission, organization and accountability of such a regional fund.

Context for Understanding this Development

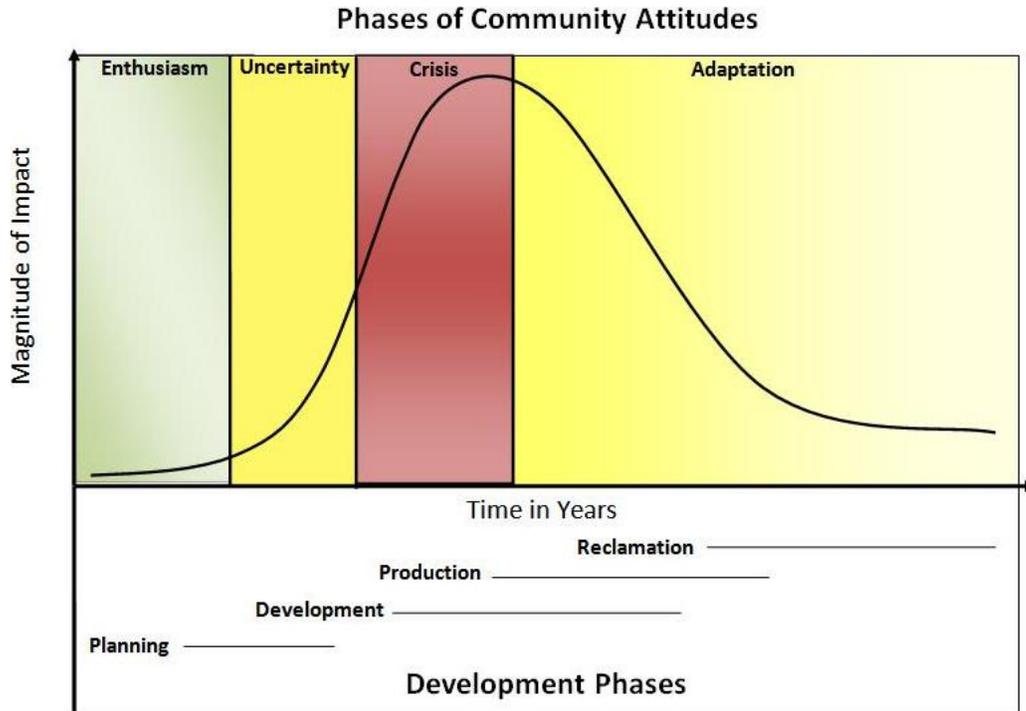
It is human nature to believe that our experiences are unique; that no other region has faced the opportunities and challenges that we have. A look at the history and research on rapid natural resource development shows a predictable four-phase energy development cycle ([Jacquet](#)) in most regions.

Planning – Mineral rights leasing begins. Permitting and land use planning activity increases. Energy companies conduct exploration and testing.

Development – With proven potential, development commences. Jobs are created in drilling, fracking, trucking, and distribution. Many jobs are initially filled by workers from outside the region.

Production – More wells come into full production; jobs increase but may decline as wells and pipelines are completed. Bakken wells are estimated to produce for 30 years, providing an opportunity to train local residents for jobs and to encourage the re-location of worker families to the region.

Reclamation – Wells are dismantled and capped, and well pads are remediated to their original land use. Jobs created require different work skills than development or production.



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There is a similar, but not concurrent, cycle in community attitudes as the energy development cycle proceeds.

Enthusiasm – During the planning phase of development, the community greets the news of lease payments to landowners and the promise of new jobs with enthusiasm.

Uncertainty – As development begins, residents realize that negative impacts come with the positive. They often find few resources to help address challenges. Uncertainty builds with more questions than answers. Pro and anti-growth factions may emerge.

Crisis – As the development increases sharply, changes are dramatic. Citizens want solutions, while governments often have limited capacity to respond. Revenues to address today's problems may not materialize. The flood of day-to-day demands makes strategic thinking difficult.

Adaptation – Over time, the core issues are identified, partnerships and plans are developed, state assistance solidifies, and mitigation actions are taken. Opposition slowly fades into acceptance.

The progression of both energy development and community attitudes is important to understand within the context of effective policy development. This is not a static process; community capacity needs (infrastructure, workforce, revenues, public services, etc.) vary throughout the development process as does the level of support and enthusiasm for development in the region. This fluid situation provides the foundational context for designing an effective long-term policy framework for oil and gas development in the region. Fortunately, there are insights to be gained from the experiences in other landscapes across the U.S. and internationally.

Policy Framework for Western North Dakota

Our role in the Western North Dakota Energy Project has been to conduct a thorough research review on energy and other natural resource development, including review of numerous policy frameworks. Based on our learning, we consider the framework outlined by [Headwaters Economics](#) in [Benefiting from Unconventional Oil](#) to be valuable as a policy framework for Western North Dakota. The report:

...analyzes North Dakota's fiscal policy in terms of how well the state collects and distributes fossil fuel revenue and how the state is capturing wealth to ensure long-term economic benefit. The report discusses how the specific development strategies for an unconventional oil resource change the nature and longevity of drilling impacts and compares North Dakota's policy to three peer energy-producing states in the West: Colorado, Montana, and Wyoming.

Through past research and analysis, Headwaters identified three basic goals for an effective long-term policy for oil and natural gas development. These goals provide guidance for the development of such policy in North Dakota. Quoting directly from the Headwaters report:

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- **Goal One: Fossil fuel extraction pays its way through effective impact mitigation.** The impacts of oil extraction on communities stem from rapid industrialization and population growth, often in rural areas, and from potential environmental impacts. These impacts should be well analyzed and revenue should be sufficient in time and amount to prepare for and manage change.
- **Goal Two: Fossil fuel extraction supports economic diversification and resilience.** Upward pressures on infrastructure and housing cost, wages, and rising community impacts can dampen economic growth in sectors outside the oil and natural gas industry, leading to specialization and slower long-term growth. Fiscal policy should provide opportunities to support and diversify sectors outside the oil and natural gas industries.
- **Goal Three: Fossil fuel extraction leaves a lasting legacy in the form of a permanent fund.** Extracting oil represents a one-time opportunity to capture wealth from the depletion of non-renewable resources. Severance taxes are designed to capture value as resources are severed, or removed, from the ground. Investing a portion of oil revenue into a permanent fund will provide lasting fiscal benefits that can help achieve the first two goals of sustainable fiscal policy.

In addition to these overarching policy goals, Headwaters research identifies several challenges that states and regions may face in achieving sound fiscal policy related to oil development and impacts. Quoting again from the Headwaters report:

- **Timing of Revenue:** Oil extraction and the associated industrial activity and population growth impose significant impacts on communities during the exploration and drilling phase of production, while the bulk of revenue derived from oil extraction comes only after production has begun. Resources are often not available in the time necessary to mitigate impacts and facilitate production.
- **Uneven Distribution:** Production taxes often benefit local governments where production occurs, such as unincorporated county areas, but impacts on infrastructure and services may be located in nearby cities and towns, creating unevenness in the location of impacts and revenue availability.
- **Revenue Volatility:** Oil prices, and therefore tax revenue, are tremendously volatile, which makes it difficult to plan for ongoing public services including schools, emergency services, and road and bridge operations.
- **Revenue Amount:** Effective tax rates vary considerably from state to state, resulting in different levels of revenue that is available to achieve tax policy goals. States often set tax rates in order to compete with their neighbors for industry activity, but oil and natural gas taxes are relatively inelastic, meaning different tax rates have little effect on the level of production in a state.

A Focus on the Development Phase - Insights

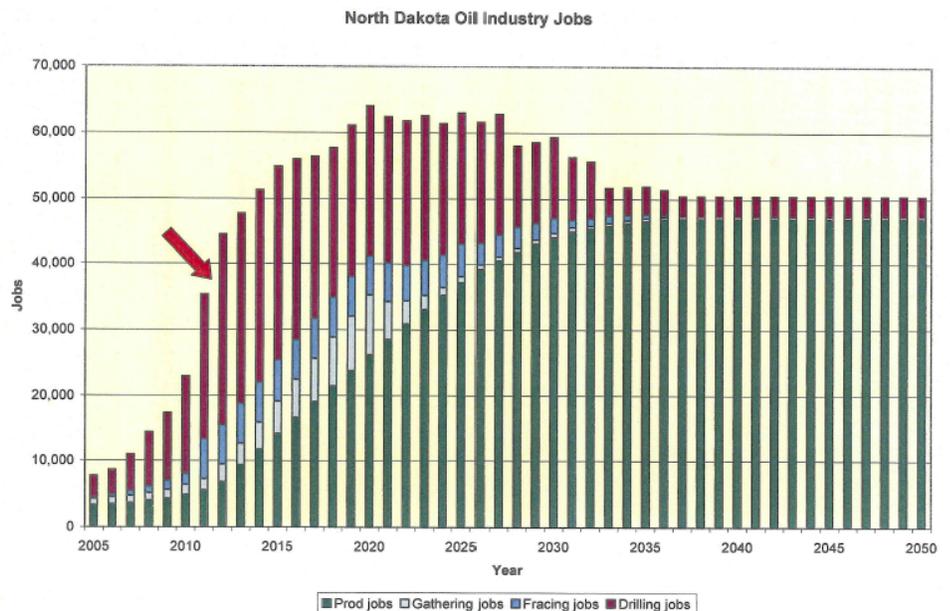
As an area moves from the Planning to Development Phase, and the pace of change begins to accelerate, regions face a range of impacts. These impacts are the consequences of energy development, both intended and otherwise, that ripple across the economy and community.

Economic impacts measure the **direct impacts** of the spending associated with construction and operation of new wells, the **indirect impacts** of the jobs and income created to serve the development, and the **induced impacts** of people spending their new income on consumption activities within the region. These are typically measured using an input-output model of the regional economy, although the use of these models is made difficult by several technical issues. North Dakota State University researchers Dean Bangsund and Nancy Hodur are developing impact reports for the Bakken.

Social impacts are also predictable and often identified as the “[Gillette Syndrome](#)” for the issues faced in Gillette, Wyoming. These include such impacts as housing shortages, increased traffic and accidents, workforce and daycare shortages, increased school enrollments, increased demands on fire, police, emergency services, overloaded infrastructure and public service systems, environmental issues, declining sense of safety and community, and rising community conflict (e.g., between newcomers and old-timers, landowners and renters).

One of the most visible impacts relates to jobs. **Workforce projections** can be made using assumptions about the total size of oil reserves, number of projected wells, jobs associated with each well, commuting patterns, etc. The chart below shows the most recent projection by Lynn Helms and the North Dakota Department of Mineral Resources. <https://www.dmr.nd.gov/>

The Helms model clearly shows the way drilling and fracking jobs ramp to a peak in the development phase, while production jobs grow slowly with the number of completed wells. This chart shows the boom’s intensity with the rapid increase in employment from 2008-2015. The duration of the peak period is relatively long at perhaps 20 years, and the decrease in employment in the production phase is much smaller than in gas shale plays in Pennsylvania and Wyoming.



A Focus on the Development Phase – Action Considerations

A number of actions may help regions cope with the intensity of the development phase.

Scenario Planning Model – Because workforce projections drive population, housing, traffic, school enrollments and public service demands, they are very relevant for local response plans. These projections also drive state workforce training efforts designed to equip local residents for new jobs. A scenario planning model would use projections such as those in the Helms model and allow leaders to test various assumptions and “what if” scenarios. This tool helps leaders understand what is coming and focus on the variables that may be controlled or influenced by local decision making.

Local Strategic Plans – The more quickly an affected community develops a plan to deal with the boom, the more rapidly it can move from crisis to adaptation to acceptance. With the benefit of a large U.S. Housing and Urban Development grant to build local planning capacity, the Vision West consortium has been moving this process forward with planning workshops in oil-producing counties in 2012.

The demand for all local public services varies directly with the number of wells drilled in the area.

Coordination Mechanism – With dozens of economic development stakeholders and resource providers working in the region, a mechanism to coordinate efforts is vital. Pennsylvania has over 20 Marcellus Task Forces coordinating activities at the county level. Created by county commissions and staffed at the county level, they function as one-stop clearinghouses to avoid duplication of effort. This model could be improved by inviting industry representation and seeking their financial support for staffing since it is in industry’s self-interest to have a coordinated response to local issues. Missoula County, MT offers another example of a coordinating body.

Robust and Predictable Regional Funding – Affected communities need quick and reliable funding to support the pace of development and allow local residents to benefit from the activity. Funding streams need to be large enough to pay for the lumpy costs of infrastructure system capacity. They need to be predictable, to flow roughly in proportion to the increased demand for public services, and to arrive quickly enough to allow a prompt local response.

Consistent with the Headwaters policy goals, funding to address short-term community impacts could come from impact fees, either consistently imposed by each county/city or through a statewide impact fee such as recommended by the [Governor’s Marcellus Shale Advisory Commission](#) and recently passed in Pennsylvania. Impact fees embody the “pay as you go” concept. Funding for short-term development impacts could also come from severance tax revenues, provided the State advanced funds to communities from past tax collections in order to eliminate the current revenue time lag.

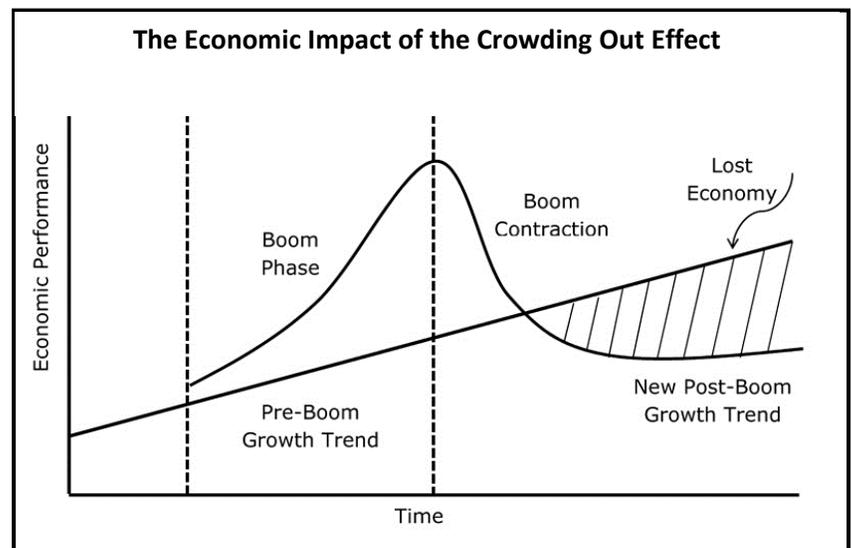
Need for a Longer-Term Policy Focus

The Crowding Out Effect, aka the Resource Curse or Dutch Disease

Analysts can estimate the economic impacts of energy development on jobs and income, and social impacts become readily apparent. Even unintended environmental effects are regulated by state and federal agencies. However, one set of unintended effects is rarely addressed and can cripple the economic future of energy-producing regions. Whenever an economy specializes heavily in a valuable natural resource, other sectors tend to suffer. The name, [Dutch Disease](#), derives from a natural gas boom in 1970s Netherlands that increased the price of labor and its currency so that it lost competitive position in international markets. Also called the *natural resource curse*, a more apt description is [crowding out effects](#). In economic terms, **crowding out effects** result from rapid increases in the price of labor and land in local markets resulting from boom demands.

Short-Term Effects - Higher wages destabilize some smaller, marginal enterprises in the area, and their doors may close. It becomes harder to fill jobs, particularly at the lower end of the wage scale, e.g., jobs in retail, lodging, entertainment, agriculture, and public services. There is the potential to lose entrepreneurial energy as well. The higher cost of living creates hardship for those most vulnerable in the area – seniors living on fixed incomes, low income residents, those with limited capacity to relocate and/or earn higher incomes. Higher wages attract temporary workers who often change the character of the community. More expensive housing makes recruiting key professionals such as teachers and health care providers difficult. High commercial rents may slow retail development.

Long-Term Effects – While short-term effects slowly, but clearly, erode the fabric of the community, the long-term crowding out effects are more subtle. Higher wages and rents reduce the long-term competitive position of non-energy industries like agriculture, manufacturing and tourism. As they decline, the economy becomes less diverse and resilient as the boom ends. ([Headwaters Economics, 2008](#)) In addition, nearly all civic capacity within oil-producing communities is focused on addressing short-term issues of roads, housing, crime and other impacts.



In essence, economic development capacity, leadership and investment focused on the oil boom crowds out any consideration of non-boom and long-term economic development and diversification.

A Focus on Post Development – Insights and Considerations

The immediate focus of regional and state leaders is understandably on addressing the numerous needs associated with rapid development such as roads, housing, workforce and public safety. However, experience suggests that leadership time and energy also needs to be focused on the post-development period, whether 20 or even 40 years from now.

Based on our research review, we have identified five key elements of a fiscally prudent long-range policy:

<p>Vision & Mission</p>	<p>Long-range policy would focus on ensuring the future economic prosperity of the energy producing counties in Western North Dakota. The three-part mission of this policy would be to 1) ensure long-term economic diversification and prosperity, 2) support the development of the energy industry, and 3) ensure stewardship of the environment and the region’s communities.</p>
<p>Institutional Mechanism</p>	<p>An appropriate, effective, efficient and accountable institutional vehicle would be established to ensure fulfillment of the vision and mission of this policy. While there are many models, we recommend consideration of a quasi-public body created by the State of North Dakota, but distanced from annual policymaking.</p>
<p>Regionally Directed</p>	<p>This long-range policy, and the programs it will enable and support, would be directed by the communities of this region through a Board of Directors representing both the State of North Dakota and the region. This element will ensure that the region builds rooted capacity to manage and support its long-term development.</p>
<p>State Accountability</p>	<p>The State would retain authority to appoint governing Board members and retain oversight of activities, while building the governance capacity of communities and citizens in the region.</p>
<p>Endowed Funding</p>	<p>The wealth being created by this development is non-renewable; a portion of the taxes generated from this development would be set aside in permanent trust to support the mission of this policy (described in more detail below).</p>

Our research review identified numerous models that could guide the framing of this long-range policy:

- **Golden Leaf Foundation** (associated with North Carolina's tobacco settlement)
- **Alaska's Native Tribes Development Corporations**
- **Iowa West Foundation** (associated with gaming in Pottawattamie County, Iowa)
- **Initiative Foundations of Minnesota**
- **Norway's North Sea Oil Trust**
- **Iron Range Trust of Minnesota**

Partner with Industry

A key design feature of the IRRRB is its focus on ensuring the continued operation of mining in the Iron Range. The IRRRB has worked collaboratively with mining interests and miners to ensure the industry's success. It has invested in research and development to develop new mining technology that has kept the Iron Range alive; for example, the development of taconite is tied to IRRRB investments with industry. We believe this element of the IRRRB provides an appropriate model for creating a constructive partnership with energy interests in Western North Dakota.

Of particular relevance for North Dakota is ***the Iron Range Resources & Rehabilitation Board (IRRRB)***. The IRRRB was created through policy enacted by the Minnesota Legislature in 1941 at the request of Governor Harold Stassen. For the past 71 years, the IRRRB has pursued a mission of ***“investing in business, community and workforce development for the betterment of northeastern Minnesota.”***

In 2010, mining in the five counties of the MN Iron Range generated nearly \$110 million in mining taxes, approximately 21% of which was set aside for the IRRRB (\$23.1 million). Between 1993 and 2011, nearly \$200 million was invested by the IRRRB to achieve a three-pronged mission:

- *Support for Ongoing Mining*
- *Community & Economic Diversification*
- *Environmental Reclamation & Stewardship*

Despite attempts to redirect IRRRB dedicated funds and funding, this policy has been protected and today has approximately \$125 million in its trust fund. The IRRRB has become a predictable and robust partner in this region, ensuring its communities long-term economic success and prosperity.

To learn more, a recorded briefing is available at [IRRRB Webinar](#). This briefing, led by IRRRB Commissioner Tony Sertich on February 28, 2012, provides an overview of the IRRRB including its formation, history and current role and mission.

http://energizingentrepreneurs.net/site/index.php?option=com_content&view=article&id=123&Itemid=4

Regional Legacy Fund Concept

The remarkable Bakken oil development is a unique event that is remaking the future of western North Dakota. The boom-like growth now occurring in this region will likely last longer than earlier development cycles, but it will not last forever. As the Bakken resource is **non-renewable**, the policy concepts of **severance taxes** and **permanent trust funds** are particularly relevant. Severance taxes provide one way to recognize the lost development potential that occurs as non-renewable resource assets are transferred out of the region permanently. Investing some portion of those taxes to create a permanent regional endowment helps to return benefits to those places most affected. The following scenario was prepared to illustrate the concept of a **Regional Legacy Trust Fund**. Our scenario illustrates the next 10 years using very conservative assumptions:

10-Year Value of Production

\$218 billion

State Share of Taxes

80% or \$17.5 billion

Local Share of Taxes

20% or \$4.4 billion

Local Development Aid

\$2.8 billion

Local development aid would rise from \$246 million in year 1 to nearly \$323 million in year 10.

Regional Trust Fund

Value in Year 10 = \$1.55 billion

The RTF would grow from just over \$27 million in year 1 to \$1.55 billion in year 10. By year 10, RTF would be generating over \$62 million annually for long-term economic diversification and development. Over the 10-year period, the RTF would produce nearly \$230 million of new long-term investment for the region.

Illustration Assumptions

Bakken Region Oil Production: We assume 37 billion barrels of oil are extracted at \$75/barrel (based on 27 to 46 Billion Barrels of recoverable reserves). The price of oil is projected to increase at 10% per year over the 10-year period. We assume daily oil production rates at 500,000 barrels and annual production at 182.5 million barrels, resulting in 1.852 billion barrels of oil produced over the period.

Overall Effective Tax Rate: The ND effective tax rate ranges from 8.7% to 10.1% of extracted value. We assume a rate of 9.4%. Comparison effective tax rates are: CO = 4.4%, MT = 10.5%, WY = 11.4% and AK = 25%.

State/Regional Shares. We assume an 80%/20% share allocation to the state and the region. The current regional share fluctuates significantly but is currently around 11%.

Development Aid. We assume that in the early years, 90% of the regional share will be deployed to communities to assist in supporting development. Over the 10 year period, the development aid share of the regional total would decline to a base of 50%.

Legacy Fund. We assume that RTF funding would begin at 10% of the regional share in year 1 and grow to a maximum of 50% in year 10 and into the future. These funds would be held in trust or endowed and the estimated annualized payout rate would be 4% of the corpus.

About this Policy Education White Paper

Paper Sponsorship. This paper was prepared at the request of the [Bush Foundation](#). The Foundation provides grant making in North Dakota, Minnesota and South Dakota, including a long-term relationship with the Western North Dakota region. Recently the Foundation conducted a tour of the Bakken Region including staff and advisory board members and commissioned this paper with the intent to capture policy insights realized through this research and analysis.

Western North Dakota Energy Project. The *Western North Dakota Energy Project* (WNDEP) has been supported by the Bush Foundation. The lead institutional partner is the Strom Center for Entrepreneurship and Innovation at Dickinson State University. Other partners include DLN Consulting, Roosevelt-Custer Regional Council for Development and the RUPRI Center for Rural Entrepreneurship. A background paper on the project can be found at [WNDEP](#).

Vision West Consortium. A primary audience for this paper is the [Vision West Consortium](#). The emergence of the Consortium provides an important gathering of leaders and residents keenly interested in the Bakken Development.

[The Center for Rural Entrepreneurship's](#) vision for rural America is one of vibrant communities and regions that embrace entrepreneurship, that find new sources of competitive advantage in their inherent assets, and that invest in a new more sustainable future for both present and future generations. The Center's mission is to help our local, regional and state partners achieve this future. We are committed to connecting economic development practitioners and policy makers to the resources needed to energize entrepreneurs and implement entrepreneurship as a core economic development strategy. We value collaboration and work with partners to bring the latest research, practice and policy innovations to leaders across rural America.

[The Rural Policy Research Institute \(RUPRI\)](#) provided founding support to create the Center for Rural Entrepreneurship in 2001. RUPRI's mission is to provide independent analysis and information on the challenges, needs, and opportunities facing rural people and places. The work of the Center for Rural Entrepreneurship, along with other centers and collaborations, helps RUPRI achieve this mission.