



# BLAISE ENERGY

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October 23, 2009

Karlene Fine, Executive Director  
North Dakota Industrial Commission  
State Capitol – 14th Floor  
600 East Boulevard Ave Dept 405  
Bismarck, ND 58505-0840

Subject: Grant Application for Blaise Energy's Flare Gas – Power Generation Commercial Viability Pilot

Dear Ms. Fine:

Enclosed please find Blaise Energy Inc.'s grant application requesting the North Dakota Industrial Commission to approve funding from the Oil and Gas Research Council to help fund the Flare Gas – Power Generation Commercial Viability Pilot. The application outlines Blaise Energy Inc.'s proposal to demonstrate the commercial viability of using otherwise wasted associated gas as fuel for on-site electrical power generation as an alternative to flaring. Blaise Energy will share the project results with the oil & gas industry via technology workshops. The workshops will explain the financial and operational benefits of this novel solution that demonstrates new methods for better resource management.

The pilot consists of one-year validation projects running concurrently. The overlapping projects will occur over an 18-month time span. The projects with separate oil operators will showcase and test different scenarios with valuable benefits to North Dakota. In this proposal, Blaise seeks to provide solutions to commonly encountered flaring issues such as the following:

- A)** A producing well which is destined to flare indefinitely due to high H<sub>2</sub>S content and the lack of financially viable options to condition the gas for sale.
- B)** An existing well that is currently shut-in due to extremely high H<sub>2</sub>S content and a lack of financially viable options to condition the gas for sale. Returning the well to active production will increase operator revenues and tax revenue to the state.

The total cost of the two projects is \$7,475,000 with a request for NDIC to contribute \$425,000 and Blaise contributing \$7,050,000. A \$100 check is enclosed to cover the application fee.

Blaise Energy is committed to complete two 18-month demonstration/validation projects running concurrently, which are detailed in this grant request. Please contact me if you have any questions or need additional information.

Sincerely,

Mark Wald

Oil and Gas Research Program  
North Dakota Industrial Commission

## Application

Project Title: ***Flare Gas - Power Generation Commercial Viability Pilot***

Applicant: ***Blaise Energy Inc.***

Principal Investigator: ***Pascal Boudreau***

Date of Application: **Oct. 23, 2009**  
**Amended Jan 13, 2010**

Amount of Request: **\$425,000**

Total Amount of Proposed Project: **\$7,475,000**

Duration of Project: **18 months**

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## ABSTRACT

Blaise Energy Inc. (Blaise) proposes to demonstrate the commercial viability of using otherwise wasted associated gas from oil production as fuel for on-site electrical power generation as an alternative to flaring. Currently, associated gas is often flared and wasted for economic or logistic reasons. Blaise will share the project results with the oil industry via technology workshops that explain the financial and operational benefits of this novel solution and demonstrates new methods for better resource management.

### Objectives:

- Prove a commercially viable alternative to wasteful flaring in North Dakota; in some cases providing a solution for “unchoking” the production limits on flaring wells, thereby positively improving the ultimate recovery of oil and gas.
- Increase utilization of associated gas in North Dakota, thereby enabling more efficient resource use and its conservation.
- Demonstrate a practical method and test new technologies to transform waste into value for both oil & gas operators and the State of North Dakota.
- Disseminate information and knowledge regarding solutions to recycle valuable resources while reducing pollution.
- Improve the public’s perception of the environmental performance and stewardship of oil field operations, while maximizing market potential for associated gas.

### Expected Results:

1. Prove the commercial viability of transforming formerly wasted flared gas into electricity for sale to utilities.
2. Prove the commercial viability of new technologies not currently used in oil & gas operations; this will lead to greater natural gas utilization, conservation and emission reductions.
3. Enable increased oil and gas production by allowing “choked down,” or shut-in wells, to return to full production, hence increasing operator revenue and state tax revenue.
4. Reduce flaring on the pilot sites; this improves overall resource conservation, utilization and sustainability by the oil & gas industry. This will enable better stewardship of a valuable North Dakota natural resource.
5. Create new jobs, specialized skills expertise, and foster small business growth in North Dakota and elsewhere.
6. Advance North Dakota as a model for America in the development of innovative, long-term energy resources to meet our nation’s growing demand for energy in a clean, environmentally friendly and sustainable way. (description from the Executive Summary of the EmPower ND Comprehensive State Energy Policy)

**Duration:** The project consists of two 12-month pilot projects running concurrently and staggered over 18 months. The two projects with separate oil operators will showcase and test different scenarios with valuable benefit to North Dakota. In this proposal, Blaise seeks to provide solutions to commonly encountered flaring issues such as:

1. A producing well which is destined to flare indefinitely due to high H<sub>2</sub>S content and the lack of financially viable options to condition the gas for sale.

2. Returning a well to active production that is currently shut-in due to extremely high H2S content and a lack of financially viable options to condition the gas for sale. Returning the well to active production will increase operator revenues and tax revenue to the state.

**Total Project Costs:**

The total cost of the two projects is \$7,475,000 with a request for NDIC to contribute \$425,000 and Blaise contributing \$7,050,000.

**Participants:** Blaise Energy Inc., Operator A, Operator B (Operator identities withheld by mutual non-disclosure agreement, pending grant approval) and Mountrail-Williams Electric Coop.

**Special Note:**

The Blaise Energy pilot project is uniquely aligned with the stated goals of EmPower ND, North Dakota's comprehensive ND State Energy Policy. The purpose of the establishment of EmPower ND is to develop a comprehensive energy policy for North Dakota that addresses in part:

1. "A New Approach: Partnerships between traditional energy industries and the emerging renewable industries are a central component of North Dakota's approach to energy development. This strategy recognizes that meeting our nation's long-term energy needs in an environmentally and sustainable way requires all players in the energy industry to be engaged and successful" (EmPower ND Executive Summary)
2. "The policy of this state to stimulate the development of renewable and traditional fossil-based energy within the state with the goal of providing secure, diverse, sustainable and competitive energy supplies that can be produced and secured within the state to assist the nation in reducing its dependence on foreign energy sources." (2007 ND Legislative Session Laws, Ch. 204, Sec. 6)
3. The policy of this state is to promote the development of new technologies, provide innovative opportunities, create additional employment and wealth that contributes to economic development and decrease dependence on foreign energy supplies. (Ibid.)
4. The assistance the state provides in research, development and marketing of North Dakota-produced energy sources... (Ibid.)
5. The need to:
  - Expand the use of existing energy resources such as coal, oil, gas, wind and hydropower by supporting continued research and development of technologies **designed to enhance the use of traditional fuels.** (Emphasis added)
  - Examine ways to diversify the state's energy resource...
  - Modernize and expand the state's energy infrastructure to ensure that energy supplies can be safely, reliably and affordably transported to homes and businesses.**
  - Examine potential innovations that will be necessary to improve environmental conditions with new technologies designed to encourage the continued use of fossil fuel as well as renewable resources.

## PROJECT DESCRIPTION

**Introduction:** Gas flaring is a widely used practice for disposal of gas associated with oil production when there is no infrastructure to use the gas. Of the 86 billion cubic feet of natural gas that North Dakota produced in 2008, an estimated 26 billion cubic feet, or 30% was flared off because of the lack of collecting systems and pipelines needed to move it to market. In comparison (according to the US Energy Information Administration), less than 1 percent of natural gas is flared from oil fields nationwide and less than 3 percent worldwide. Flaring natural gas wastes resources, creates pollution, emits carbon monoxide, nitrogen oxide, hydrogen sulfide, and unburned hydrocarbons, which contribute to pollution. A commercially viable alternative to flaring would provide tremendous advantages in a number of areas including increased profitability for operators and resource owners, improved industry image and better resource utilization.

Blaise's electrical generation processes use tightly controlled combustion techniques that decrease emissions by approximately 75% versus flaring. This will improve the overall air quality in North Dakota and the perceived environmental impact of the oil & gas production industry by reducing the waste of a vital natural resource. This grant request is intended to demonstrate a unique, practical and commercially viable solution of on-site electricity generation and its subsequent sale to the grid as an alternative to flaring. This business model has many additional benefits to North Dakota, which are outlined in this proposal.

North Dakota Century Code regulating the release of associated gas and Recycled Energy:

**38-08-06.4. FLARING OF GAS RESTRICTED - IMPOSITION OF TAX - PAYMENT OF ROYALTIES - INDUSTRIAL COMMISSION AUTHORITY.**

**43-02-03-45. VENTED CASINGHEAD GAS.**

**43-02-03-60.2. FLARING EXEMPTION**

**49-02-24.7 RECYCLED ENERGY DEFINED**

**49-02-26 QUALIFYING FOR RENEWABLE ELECTRICITY AND RECYCLED ENERGY CREDITS**

All casing head gas in North Dakota is required to be flared and not vented. Gas that is not connected to a gathering line is subject to payment of royalties and taxes under 57-51-02.2, unless the operation meets the criteria of being economically infeasible under 43-02-03-60.2, then qualifying for a flaring exemption.

The United States is ranked 11<sup>th</sup> among the top 20 flaring countries. North Dakota is the 3rd state behind Wyoming and Texas for volume of gas flared, accounting for 9.4% of the U.S. total in 2007 according to the US Department of Energy's Energy Information Administration (DOE, EIA). Since 2005, a sharp increase in gas flaring has followed the increased oil production levels in North Dakota. Gas produced from oil wells and gas wells was 55,381 MMcf, and 16,416 MMcf respectively. The majority (77%) of gas produced in North Dakota is associated gas. The marketed gas production in North Dakota was 54,745 MMcf, which has remained consistent over time. This means the majority of gas associated with North Dakota's new oil production is flared and provides a good opportunity to invest in gas gathering systems or to investigate alternative gas utilization options. The volume of gas flared and wasted in North Dakota

could be used to produce approximately 100 – 150 MW of new electric power annually. This is enough to supply the annual electric needs of between 100,000 to 150,000 average ND households.

**Objectives:**

Blaise Energy Inc’s pilot project objective is to prove the commercial viability of transforming otherwise flared and wasted associated gas into high quality, reliable and environmentally friendly electricity for sale to the grid.

Blaise intends to test the financial merits of using a gas turbine generator set and other gas conditioning technologies already proven and utilized in the oil industry in a new configuration to utilize the associated gas. The recycled energy has the additional benefit of being generated near the oil and gas production sites where the majority of industrial electric load is consumed. This co-location will help to offload North Dakota’s increasingly strained intrastate transmission grid.

The pilot project will attempt to provide a solution to improve and maximize the utilization of associated gas by demonstrating an alternative to flaring. This will help to conserve a valuable North Dakota resource, improve the oil & gas industry’s environmental stewardship and improve overall air quality in the process. Blaise will also host one or more technical workshops to educate oil & gas producers on this alternative option for associated gas utilization.

**Additional Benefits:**

Funding this pilot project is an ideal way for North Dakota to demonstrate its commitment to the EmPower ND comprehensive state energy policy. EmPower North Dakota calls for partnerships between traditional energy industries and the emerging renewable industries. North Dakota views this as being central to its approach to energy development. This strategy recognizes that meeting our nation’s long-term energy needs in an environmental and sustainable way requires all players in the energy industry to be committed to innovation and new technologies.

Blaise Energy is actively building partnerships between two vital, yet traditionally disconnected, energy industries: the oil and gas industry and electric utilities. Blaise is doing this by actively working with oil operators to help them reduce bothersome flaring and by working with the local Electric Generation and Transmission (G & T) Cooperative and several local distribution cooperatives to deliver needed electricity into the grid. These electric distribution cooperatives and their members benefit by using locally produced power that minimizes the necessity of paying for expensive new high capacity transmission infrastructure to handle increased demand.

Blaise Energy’s business model is fully aligned in support of the two top EmPower ND goals of 1) doubling North Dakota’s energy production from all sources by the year 2025 to drive economic growth, and 2) support the nation’s 25X25 Initiative to derive at least 25 % of all energy produced from renewable sources by 2025. (In North Dakota, Blaise’s form of electricity generation is considered renewable/recycled as of June, 2009 [see 49-02-24 and 49-02-26 on page 5])

This project's successful funding and execution will further North Dakota's progress toward the EmPower ND goals by facilitating the energy industry partnerships and advancing the energy production from renewable sources.

**Methodology:**

Blaise will deploy patent-pending mobile generation units, which contain all necessary components to condition the associated gas, efficiently burn it in a natural gas powered turbine generator and safely deliver the recycled electricity to a local Rural Electric Distribution Cooperative. We will deploy existing established technologies configured in a unique way. All components making up the mobile generation units are proven and commercially available. The focus of this pilot is to test the financial viability of this unique configuration on different gas condition scenarios. Fully understanding the operational costs and resilience of this equipment in the harsh oil field environment will allow us to determine if target margins can be achieved and maintained, hence prove the commercial potential of this solution in North Dakota.

The projects will seek to test multiple flaring scenarios common to North Dakota in order to validate their commercial viability. The following information can be scaled according to the gas volume of the specific site selected:

- Generate 24,000 KWh per 325 MMBTU (or 325 MCF @ 1000 BTU) of associated gas. In terms of a daily rate, this volume (325 MCF) would be enough to run a 1 MW generator and supply about 1000 average US homes.
- This scenario would prevent the wasting of almost 120,000 MCF of natural gas per year.
- This scenario could help displace coal generation equivalent to 10 tons of coal per day or 3650 tons per year.

Following are two pilot project scenarios being considered:

Operator A has a producing well that is destined to flare indefinitely due to high H2S content and the lack of financially viable options to condition the gas for sale. The Blaise solution is expected to provide additional revenue to the operator where none now exists, while reducing CO2e by 10,600 tons, NOx by 13 tons and VOCs by 31 tons per year when compared to current emissions from the existing flare and the offsetting of an equivalent amount of electrical generation produced from coal. This site is currently flaring 170MCF/d of 1530 BTU/scf, 4% H2S gas.

Operator B has an existing well currently shut in due to extremely high H2S content and the lack of financially viable options to condition the gas for sale. The oil production currently forgone is estimated at 130 bbl/day, representing significant forgone revenue to the operator and forgone state tax revenue of \$166,000 per year (5% tax, \$70 bbl). The Blaise solution is expected to provide additional revenue to the operator where none now exists, while reducing CO2e by 68,900 tons, and NOx by 73 tons per year when compared to offsetting the equivalent amount of electrical generation from coal. H2S must be scrubbed from the gas before burning in the



generator to keep SO<sub>2</sub> emissions below EPA thresholds. This site is currently shut in, however has a potential of 130 bbl/d and 2900MCF/d of 1470BTU/scf, 11%H<sub>2</sub>S gas.

Pilot sites may not be identical to the considered scenarios above but will have the same profile, and yield equal benefits to the state and oil and gas industry. Final site selection is currently under review in coordination with the oil operators.

It is important to remember that the objective of the Pilot is to prove financial viability of utilizing casing head gas to generate electricity for sale back into the electrical grid. Understanding the financial impact of the oil field environment and gas variation is critical to proving commercial viability. The focus of the pilot will be on precisely monitoring all costs and revenue and ultimately comparing them with assumptions as well as stated targets. All project costs will be tracked closely and any expenditure will require approval in order to insure no costs are omitted. Revenue is single sources and should be much easier to track. All costs and revenue are going to be normalized to a cost per kWh produced with one-time costs spread over 3 years.

Multiple technology transfer workshops will be hosted to share information with the oil industry. Lessons learned, implementation, operations and financial information will be presented and collateral (PowerPoint presentations, White Paper) shared at these workshops. We will coordinate with other oil operator events to maximize participation. This pilot seeks to prove the commercial viability of this solution; if successfully proven, these workshops should encourage the oil operators to conserve more gas by leveraging these demonstrated methods.

**Anticipated Results:**

1. Proving it is commercially viable to eliminate flaring by transforming the otherwise wasted natural gas into electricity for sale to utilities. Commercially acceptable profit margins will be determined via this pilot by validating costs and revenue. Publicly disclosed results will be pass/fail with proprietary financial details provided in the confidentiality section.
2. Determine whether a new configuration of existing and proven technology, not currently used in oil & gas operations, is commercially viable. The pilot project will allow us to validate the robustness and flexibility of the selected equipment and to gauge its expected service life in a harsh H<sub>2</sub>S environment. The per kWh equipment cost and its operational cost will be validated during the pilot, confirming the required margin of ½ cent per kWh.
3. Enabling increased oil and gas production by providing an alternative to the curtailing of oil production when flaring limits are reached. This will allow “choked down,” or previously shut-in wells, to return to full production, hence increasing operator revenue and state tax revenue. (Naturally, increased production quantities are dependent on the gas volumes of the sites being analyzed and will vary according to final site selection).
4. Reduced flaring on the pilot sites, which will further prove the oil & gas industry’s capability to better steward and utilize a valuable North Dakota natural resource. This better utilization will produce one megawatt hour of electricity for every 13 MCF of otherwise wasted natural gas. This is enough electricity to power the average North Dakota household for one month.

5. Create new jobs and foster small business growth by developing a new industry segment to maximize the potential of North Dakota's oil & gas industry. Blaise will leverage local oilfield service companies for equipment installation, operations and maintenance, thereby supporting the local economy. By proving commercial viability of the solution, Blaise would stimulate the economy, and create local expertise. The anticipated job growth is an additional 1 employee per megawatt of generation capability placed in service. (Management, sales, administrative, service, etc.)
6. A technology transfer to oil operators of the existence of commercially viable alternatives to flaring. Blaise will conduct a series of workshops to inform the oil operators of additional solutions to flaring in ND. (Note: reference emission reduction potential)
7. Advance North Dakota leadership and resourcefulness as a model for America in the development of innovative, long-term energy resources and energy efficiency to meet our nation's growing demand for energy in a clean, environmentally friendly and sustainable way. (description from the Executive Summary of the EmPower ND Comprehensive State Energy Policy)

**Facilities:**

Blaise will deploy mobile, skid-mounted, generation units on existing well locations. The units will contain all necessary components to condition the gas, generate green recycled electricity and transmit it safely to the local rural electric distribution cooperatives.

**Resources:**

- People/Companies
  - Blaise Energy team
  - Oil Operators
  - Local Electric Utilities
  - Basin Electric Power Cooperative
  - Equipment manufacturers
  - State: NDIC-Oil and Gas Research Council, ND Dept. of Health, ND Dept. of Commerce
- Equipment
  - High efficiency gas turbine generators
  - Latest gas conditioning techniques (e.g. remedying low BTU or high H<sub>2</sub>S contaminated natural gas)
  - Electrical Interconnect Equipment
  - Remote Monitoring Equipment
- Finance
  - Founders
  - Investors / Lenders
  - Equipment financiers
  - State and Federal economic assistance programs

- Knowledge
  - Oil & Gas Industry Advisors
  - Equipment Manufacturers
  - Utility Industry Advisors
  - Local Rural Electric Cooperatives
  - Basin Electric Power Cooperative
  - ND State agencies' support

**Techniques to be Utilized, Availability and Capability:**

Blaise will utilize existing and proven “off the shelf” equipment, such as GE, Pratt & Whitney and Capstone turbines, and electrical equipment vendors already in use by Electrical Coops. We will condition the associated gas utilizing existing and proven methods such as Amine and membrane filters, and other accepted gas conditioning equipment. These methods will allow for a greater usable gas range and optimal combustion in a gas turbine generator, producing reliable and consistent electricity for sale and introduction into the local electrical grid. Blaise has sourced all necessary equipment and configured it in a fully enclosed, mobile, skid-mounted manner. The proprietary solution leverages commercially available equipment packaged to ensure efficient installation and re-deployment. Components have been carefully selected to maximize reliability, flexibility and emission reductions. Significant pre-planning with local electric utilities as well as with Basin Electric will accelerate interconnections to the electric grid.

Blaise has consulted with and will utilize the expertise of respected firms in the field, and will make use of the existing gas analysis provided by the oil operator. We can accommodate gas from 200 to 2200 BTU and H2S content up to 12% by leveraging enhanced gas conditioning methods.

During the final 6 months of the project, Blaise will host technology workshops to share valuable insights gained with oil operators and the community. The technology workshop will include the lessons learned during the projects, and their benefits to the oil & gas operators, local electric utilities, North Dakota and the environment.

**Environmental and Economic Impacts while Project is Underway:**

The Blaise solution seeks to improve both the environmental and economic impact while the project is underway. The combined environmental impact is an expected reduction of 79,500 tons a year of CO<sub>2</sub>e as well as measurable reductions of other pollutants. Classified as “recycled” energy in North Dakota, the electricity produced will contribute to the state’s renewable/recycled energy targets. The positive economic impacts will be shared among, the oil operators, the local electric cooperatives, Basin Electric and the State of ND. The benefits will manifest as soon as the pilot project is operational and generating energy into the local grid. The offloading of demand congestion on the local transmission lines and elimination of electrical line loss will be another immediate benefit. In Project B, a new state tax revenue stream will begin with the resumed well operation and expected production of 130 bbls per day. The recycling and efficient use of over 3000 MCF per day of wasted natural gas has positive environmental and financial impacts.

The location of the pilot project in ND will allow Blaise to prove the financial viability of this process in an area with some of the lowest electricity rates in the country.

### **Ultimate Technological and Economic Impacts:**

The scientific and technical contribution is the commercial application of existing and separate technologies, and applying in an innovative way to a new and untested business model. If the Blaise pilot project is commercially successful and scalable, it will create the opportunity for new “Clean & Green” jobs and additional subject matter expertise in North Dakota. It will also demonstrate the state’s leadership in efficient resource management and increase oil and gas production. Successful validation will enable the widespread commercial deployment of new alternative energy technologies and techniques, many of which are not currently used anywhere else. Blaise expects to demonstrate an ongoing positive economic impact through the creation of additional state tax revenue during the project and through future commercial deployments. Job creation, resource conservation, Renewable Energy Credit (REC or “Green Tag”) accumulation, emission reductions and reduced transmission line congestion are all anticipated outcomes that contribute to the positive economic impact of this solution.

### **Why the Project is Needed:**

- Blaise’s Pilot Project is perfectly aligned with NDIC, OGRC & EmPower ND Goals:
  - The mission of ND DMR’s Oil and Gas Division is to **“encourage and promote the development, production, and utilization of oil and gas in the state in such a manner as will prevent waste, maximize economic recovery,** and fully protect the correlative rights of all owners to the end that the landowners, the royalty owners, the producers, and the general public **realize the greatest possible good from these vital natural resources.”** (Emphasis added.)
  - One of the ND Oil and Gas Research Council’s Statutory Goals & Purposes is to: **“Encourage, and promote the use of *new technologies and ideas* that will have a positive economic and environmental impact on oil and gas exploration, development, and production in North Dakota.”** (Emphasis added.)
  - **OGRC “Grant priority is to be given to those development projects, processes, ideas, and activities which meet the following goals and objectives:”** (Abbreviated list)
    - Positively effect ultimate recovery from North Dakota’s existing oil and gas pools.
    - Identify oil and gas exploration and production technologies presently not used in North Dakota.
    - Maximize the market potential for oil, natural gas, and the associated byproducts produced therewith
    - Improve the overall suitability of the oil and gas energy industry in North Dakota through the development of new environmental practices that will help to reduce the footprint of oil and gas activities
    - Develop baseline information that will lead to other projects, processes, ideas and activities.

- North Dakota’s Comprehensive State Energy Policy encourages the more efficient use of existing resources for the benefit of its citizens. This solution will provide realistic and significant advancement toward that goal without any negative tradeoffs. North Dakota must continue to demonstrate its leadership and forward thinking in sustainable oil & gas development.
- Reduced Flaring - The proposed solution can significantly reduce waste in North Dakota, and the staggering value of the lost opportunity to commercialize currently wasted associated gas. Proving commercial viability of this solution could significantly reduce flaring on a broader scale in North Dakota.
- According to a 2007 OGRC/Basin Electric study entitled “Williston Basin Oil Development Power Load Forecast Study,” oil production is electricity-intensive and is one of ND’s largest consumers of industrial electricity. This increasing demand is straining the infrastructure of local rural electric cooperatives and is driving costly infrastructure upgrades. New sources of dependable, base-load Distributed Generation capability, co-located with demand, provide a near optimal solution for the utilities. Wind power is currently unable to provide reliable base-load generation capability.

**Justification for use of state funds:**

1. Blaise Energy requires OGRC funding to enable risk sharing between a nascent company and the State of North Dakota on a worthwhile pilot project capable of yielding tremendous economic and environmental benefits to the citizens and taxpayers of ND.
  - a. As stated earlier, the pilot projects are attacking different gas flaring scenarios such as Low-BTU, difficult-to-flare gas and High-H<sub>2</sub>S gas requiring expensive sulfur scrubbing. Neither of these gas streams are currently commercially viable because they are not of suitable quality for introduction into commercial pipelines.
2. Blaise will deploy extra emission monitoring equipment on the pilot sites in order to quantify fully the emission reductions. This would not be required in a routine installation. This additional equipment will help to quantify emission reductions potential at future sites. Emission reduction information will be presented in the Technology Transfer Seminars.
3. The projects will provide validation and tests assumptions for the feasibility of a larger scale recycling and use of otherwise wasted natural gas being flared in North Dakota.

**STANDARDS OF SUCCESS**

1. Success will be demonstrated through the commercial validation and consequential wider deployment and adoption of the solution as measured by the ability to sustain business operations at the end of the pilot project and to maintain a net profit margin of \$.005/ kWh. (One half cent per kWh)
2. Fostering and development of a new recycled energy industry / vertical market. Proving new technology configurations not currently used in oil & gas operations, will be demonstrated through the commercial validation of the solution and creation of a new recycled energy application.

3. Reduced flaring of the gas currently being wasted at a well site, monitoring and reporting volumes of gas being utilized and recycled during the project and in all ongoing operations. Blaise anticipates the flaring reduction to be 13 MCF per MWh hour of electricity produced.
4. Increase Oil and Gas production - Blaise will receive oil production reports from the oil operator for the project duration in order to quantify possible additional production and the associated increase in tax revenue. (In scenarios where sites are shut in or curtailed on production)
5. Payback to the State - Blaise's expectation is that the funds requested in this grant proposal will be repaid to the State of North Dakota in the form of additional production tax revenue and job creation. For every 100 barrels of increased production, there will be an additional \$375 of production tax revenue for ND (based on \$75/bbl)
6. New Jobs, new opportunities and additional subject matter expertise will be created through the successful validation of pilot for commercial application as new employees are added for future deployments. Anticipated job creation will be 1 new employee per megawatt of generation capability installed.
7. The public and private sector will benefit from the projects results through the education of the oil and gas industry via technology workshops. The workshops will explain the financial and operational benefits of new solutions and demonstrate new methods for better resource management.
8. Blaise will provide detailed reports to the Commission at the 6 and 12-month intervals from the date funds are received documenting: how monies were spent, amount of gas recycled, emissions reduced and additional state production tax revenue generated.

## **BACKGROUND/QUALIFICATIONS**

The Blaise management team has extensive experience in leading edge technology startups, engineering, finance, sales, and marketing. The Blaise team has built relationships with industry experts in all associated fields required to deliver the solution proposed: Generator Set Manufacturers, Gas Conditioning Consultants, Oil & Gas Operators, Local Electric Coops, Basin Electric, (Midwest Renewable Energy Tracking System (M-RETS), US Dept. of Energy, US EPA, North Dakota Dept. of Health, The Energy and Environmental Research Center (EERC) and the Global Gas Flaring Reduction Partnership (GGFR). The principal investigator (Pascal Boudreau) is an electrical engineer with a specialty in control systems. Pascal is in charge of Operations and engineering and has held the following positions prior to his involvement with Blaise Energy: Manager of Sales Engineering for JDSU, Director of Implementation for Terabeam, Director of Network Development for NBTel (now Alliant), System Control Engineer at NBPower. Pascal has over 15 years of experience managing complex projects and fostering relationships at all corporate levels.

## **MANAGEMENT**

The Blaise team will manage the project using best practice project management methodologies and will leverage the vertical areas of expertise of the other project participants. The site's gas line design and build out will be performed by the oil & gas operator's preferred contractor, who will be familiar with the project site. The electrical interconnect work will be performed by Mountrail-Williams Electric Coop's preferred contractor. The gas pre-conditioning and generator set will be commissioned and tested onsite by Blaise's preferred equipment manufacturer.

Blaise will host weekly conference calls (at a minimum) to communicate project milestones and next steps. A web portal will be established to share the project plan, activity calendar and other documents among stakeholders.

The 1<sup>st</sup> 6 months of the project duration is dedicated to site preparation, equipment installation and connection to the grid. Preparations have already been made to ensure these tasks can easily be accomplished within that timeframe: Equipment ready to ship, contractors identified and availability discussed, switching equipment on hand with local utility, permit and application paperwork completed and ready to deliver. Evaluation points during this stage will be tied to on time execution and ultimately to connecting to the grid on or before schedule.

The last 12 months of the project duration will consist of monitoring the operation of the system and documenting data to assess performance and benefits: emission reductions, power generation, operational cost, revenue, system availability and additional production. Evaluation points will be tied to monitored variables mostly collected remotely and automatically. Recorded data will be compared with predicted results, analyzed and reported at 6 and 12-month intervals.

Blaise will act as the general contractor and work with project participant to meet or exceed timeline objectives.

## **TIMETABLE**

The following milestone targets will anchor the project schedule. Blaise will work closely with other project participants to finalize project details and establish realistic timelines to ensure success. A Gantt chart of the project (with details) will be provided as a confidential attachment once final site selection is determined. See Appendix A for projected Timeline. (Note: this timeline is relative and will become absolute upon final site selection, defining start date)

Project Milestones:

1. Finalize contracts
2. Finalize Designs and interconnect analysis
3. Permits
4. Procurement

5. Site Preparation
  - a. Gas Line
  - b. Electric Interconnect
6. Equipment Install, turn up, and testing
7. Emissions monitoring
8. Grid Interconnect
9. Full System Testing
10. Operations handoff
11. 1<sup>st</sup> 12 months of Operations

### BUDGET

Project Associated Expense	NDIC's Share	Applicant's Share (Cash)	Applicant's Share (In-Kind)	Other Project Sponsor's Share
<b>Pilot A</b> Generation Equip.	\$0	\$75K Cash \$525K (Financed)	Consulting and Labor	\$0
<b>Pilot A</b> Site prep including elec. grid connection	\$37.5K	\$0K	Consulting and Labor	\$0
<b>Pilot A</b> Public outreach	\$12.5K	\$0	Consulting and Labor	\$0
<b>Pilot A</b> Salaries	\$0	3x1 year salaries \$90K	Consulting and Labor, 3x reduced salaries \$360K	\$0
<b>Pilot A Totals</b>	\$50K	\$690K	\$360K	\$0
<b>Pilot B</b> Generation Equip.	\$0	\$0 Cash \$6M (Financed)	Equity, Consulting and Labor	\$0
<b>Pilot B</b> Site prep including elec. grid connection	\$375K	\$0	Consulting and Labor	\$0
<b>Pilot B</b> Salaries (In addition to Pilot A – overlap only counted once in overall total)	\$0	3x1 year salaries \$90K + \$60K	Consulting and Labor , 3x reduced salaries \$300K	\$0
<b>Pilot B Totals</b>	\$375K	\$6.150M	\$300K	\$0
<b>Overall Totals</b>	\$425K	\$6.75M	\$300K	\$0

See Appendix B for revised Budget.

If less funding is available from the OGRC, Blaise will seek additional outside funding in an attempt to maintain project schedule. Schedule may be delayed but Blaise will do everything possible to minimize impacts to the project.



## **CONFIDENTIAL INFORMATION**

The names of the oil & gas operators participating in this pilot are being kept confidential due to existing NDAs. Any data used for analysis on behalf of the oil operator will also be kept confidential. Additional details, if required for grant approval, can be provided through an amended application.

Blaise Energy's proprietary equipment choices and financial data, including, but not limited to, costs and profit margins will remain confidential.

## **PATENTS/RIGHTS TO TECHNICAL DATA**

Patents pending on equipment configurations, processes and methods for the transformation of flared natural gas into electricity.

## **Affidavit of Tax Liability**

I, Mark Wald, certify that Blaise Energy, Inc. does not have any outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.

\_\_\_\_\_

Mark Wald

\_\_\_\_\_

Date

## **STATUS OF ONGOING PROJECTS (IF ANY)**

Blaise is not the recipient of previous funding from the Commission.