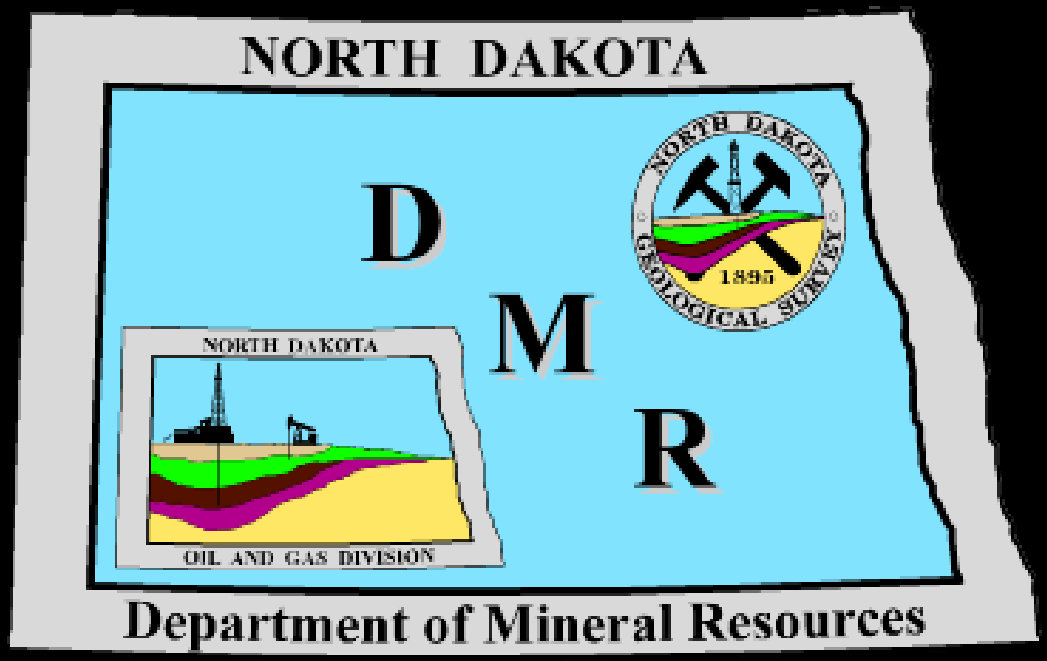
North Dakota Department of Mineral Resources



http://www.oilgas.nd.gov

http://www.state.nd.us/ndgs

600 East Boulevard Ave. - Dept 405
Bismarck, ND 58505-0840
(701) 328-8020 (701) 328-8000

NORTH DAKOTA

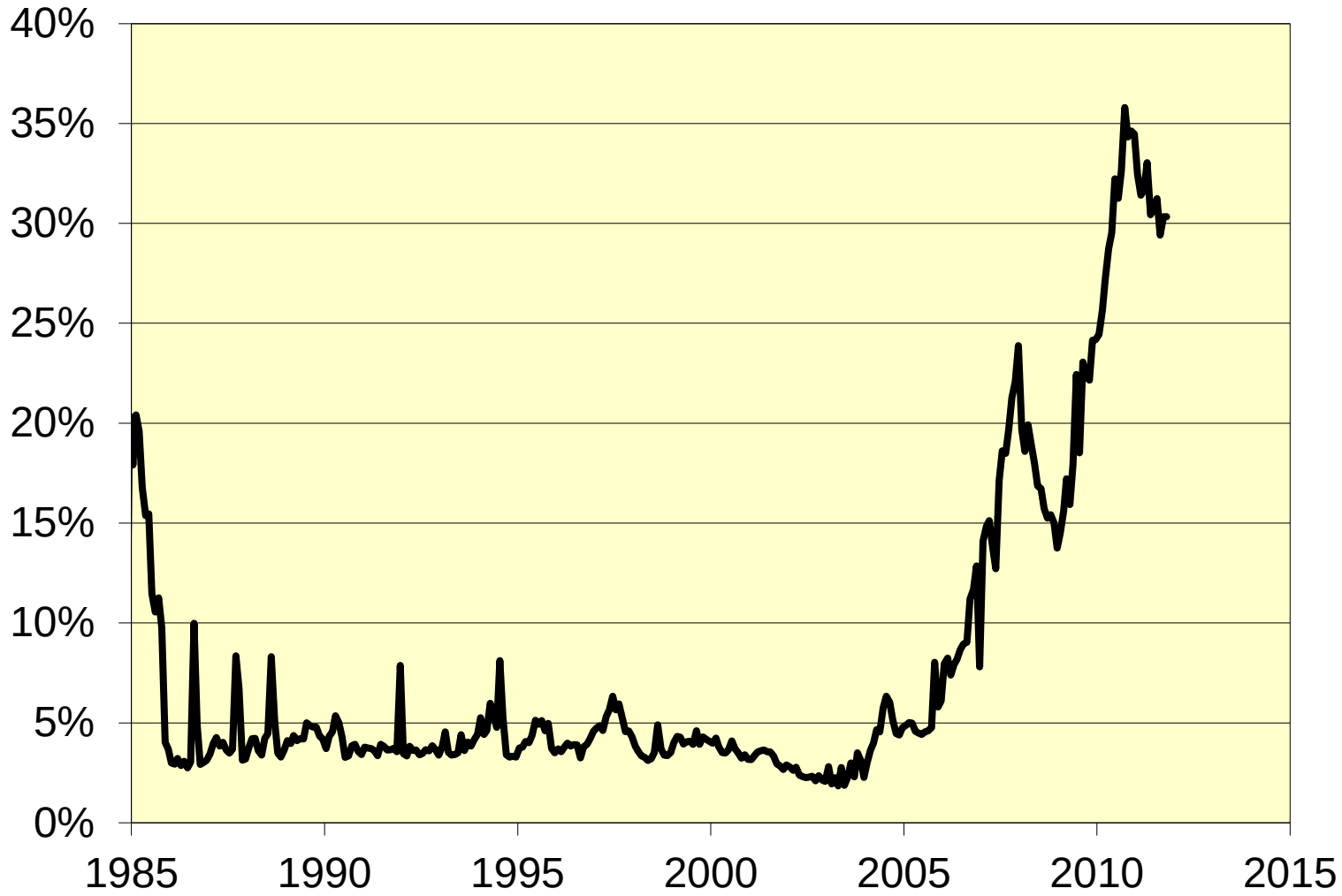
OCTOBER PRODUCTION

- **23.8 million barrels of oil or 747,238 barrels of oil per day**
- **24.6 Billion cubic feet of natural gas or 796 million cubic feet per day**

NORTH DAKOTA:
WHERE ARE WE GOING?

- **1,800 to 3,000 wells/year = 2,000 expected**
  - **200 rigs can drill the wells needed to secure leases in 1 year**
  - **200 rigs can drill the wells needed to develop spacing units in 18 years**
  - **35,000-40,000 more new wells**

North Dakota Monthly Gas Flared



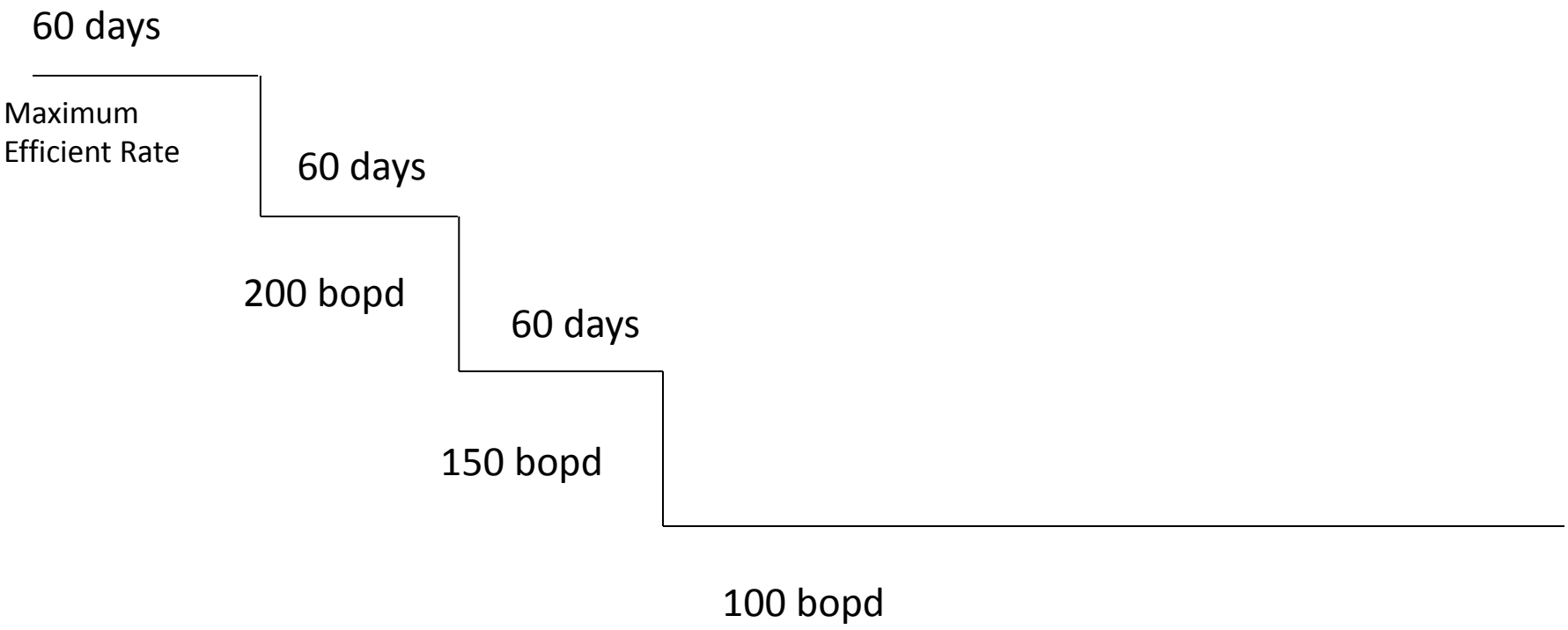
High: 36%, September 2011

Recent Drop: 29%, August 2012

North Dakota Regulations

38-08-04

38-08-04. JURISDICTION OF COMMISSION.



NORTH DAKOTA REGULATIONS

38-08-06.4

- 38-08-06.4. FLARING OF GAS RESTRICTED - IMPOSITION OF TAX - PAYMENT OF ROYALTIES - INDUSTRIAL COMMISSION AUTHORITY.
- *As permitted under rules of the industrial commission, gas produced with crude oil from an oil well may be flared during a one-year period from the date of first production from the well. Thereafter, flaring of gas from the well must cease and the well must be capped, connected to a gas gathering line, or equipped with an electrical generator that consumes at least seventy-five percent of the gas from the well. An electrical generator and its attachment units to produce electricity from gas must be considered to be personal property for all purposes. For a well operated in violation of this section, the producer shall pay royalties to royalty owners upon the value of the flared gas and shall also pay gross production tax on the flared gas at the rate imposed under section 57-51-02.2. The industrial commission may enforce this section and, for each well operator found to be in violation of this section, may determine the value of flared gas for purposes of payment of royalties under this section and its determination is final. A producer may obtain an exemption from this section from the industrial commission upon application and a showing that connection of the well to a natural gas gathering line is economically infeasible at the time of the application or in the foreseeable future or that a market for the gas is not available and that equipping the well with an electrical generator to produce electricity from gas is economically infeasible.*

NORTH DAKOTA REGULATIONS:
43-02-03-60.2

43-02-03-60.2. FLARING EXEMPTION.

The connection of a well to a natural gas gathering line is "economically infeasible" under North Dakota Century Code section 38-08-06.4, if the direct costs of connecting the well to the line and the direct costs of operating the facilities connecting the well to the line during the life of the well, are greater than the amount of money the operator is likely to receive for the gas, less production taxes and royalties, should the well be connected. In making this calculation, the applicant may add ten percent to the amount of the cost of connecting the well and of operating the connection facilities used to determine whether a connection is economically infeasible. This ten percent may be added in consideration of the cost of money and other overhead costs that are not figured in the direct costs of connecting the well and operating the connecting facilities.

An applicant for an exemption under North Dakota Century Code section 38-08-06.4 must, at the minimum, present evidence covering the following areas:

1. Basis for the gas price used to determine whether it is economically infeasible to connect the well to a natural gas gathering line;

2. Cost of connecting the well to the line and operating the facilities connecting the well to the line;

3. Current daily rate of the amount of gas flared; and

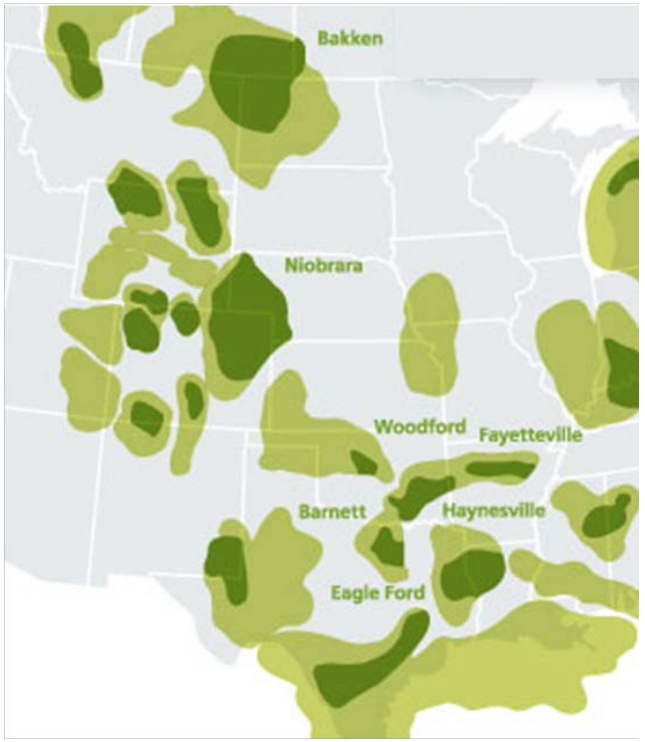
4. The amount of gas reserves and the amount of gas available for sale.

NORTH DAKOTA REGULATIONS:
FUTURE LEGISLATION?

Bakken EXPRESS

A BX Energy Company

BX ENERGY



DENSE PHASE TRANSPORT

December 2012

Stranded Gas/Liquids Capture & Transport

Objective

- Economically and safely capture stranded gas & liquids as dense phase and transport to gathering pipelines.

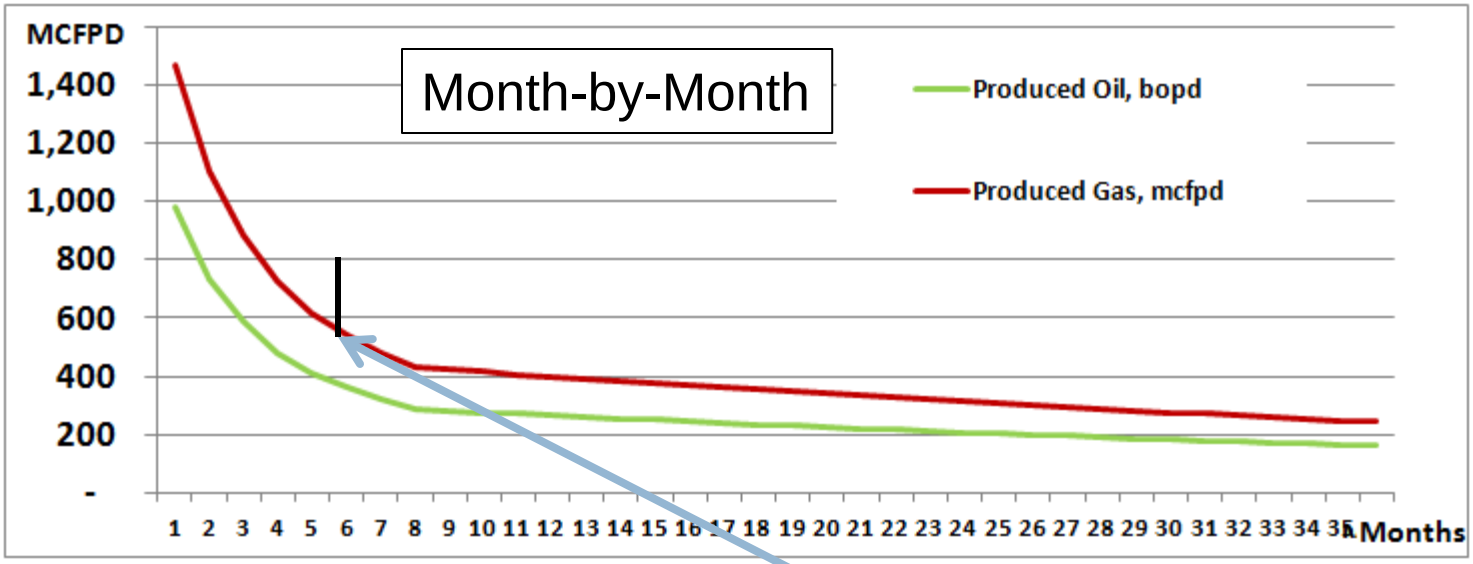
tmaloney@bxenergy.com
701-347-1602

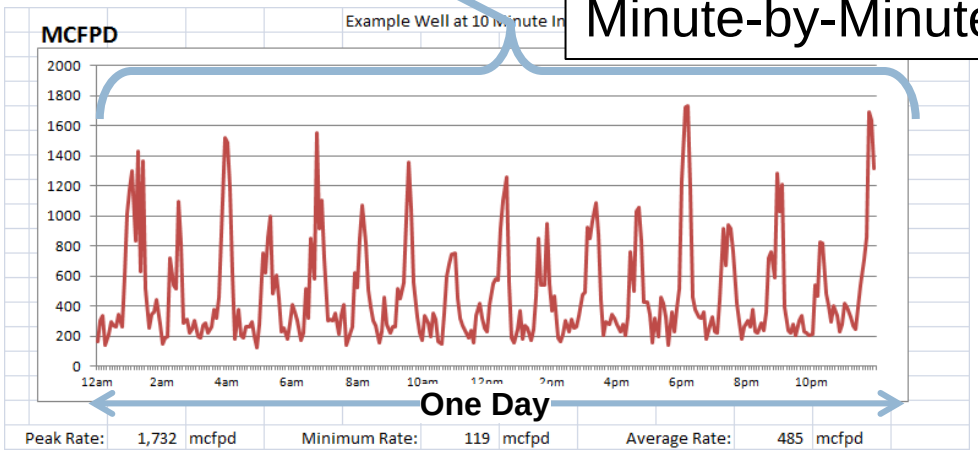
The Nature of Stranded Gas

- To monetize stranded associated gas the SOLUTIONS need to address…
  - Time Before Hookup – sometimes short or long, often changes
  - Well Life Cycle – steep early declines, long low-rate tail
  - Instantaneous Gas Rates – large swings minute-by-minute
  - Composition – 70-80% C_1-C_2, 15-20% C_3-C_6 (~4 gpm)
  - Buyer of Product – dense phase, NGL, electricity, NH_3
  - Maintenance – skilled personnel in remote locations
- …and find their “sweet spot”.

tmaloney@bxenergy.com
701-347-1602

Typical Gas Production Rates





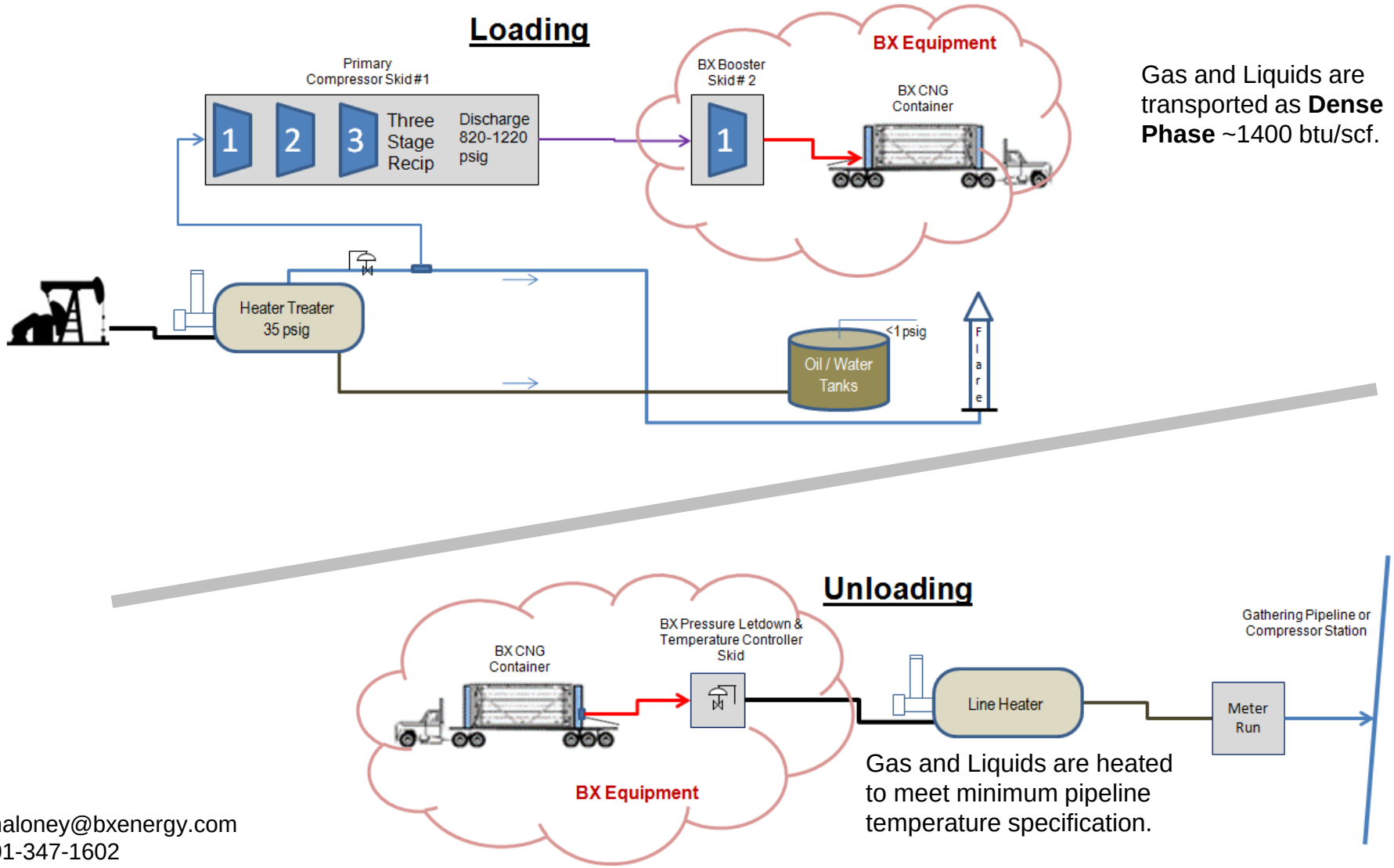
tmaloney@bxenergy.com
701-347-1602

Dense Phase Transport

- Technologies
  - Compress entire gas/liquids stream to Dense Phase
  - Transport via standard CNG tube trailers
- “Sweet Spot” for Dense Phase Transport
  - Early well life when gas rates are high
  - Multi-well pads
  - Pipeline tap within 50 miles to sell gas and liquids

tmaloney@bxenergy.com
701-347-1602

Process Flow



Gas and Liquids are transported as **Dense Phase** ~1400 btu/scf.

Gas and Liquids are heated to meet minimum pipeline temperature specification.

tmaloney@bxenergy.com
701-347-1602

Wellsite Loading Operation

CNG Tube Container

Compressor Skid

Heater Treater

tmaloney@bxenergy.com
701-347-1602

Pipeline Unloading Operation

tmaloney@bxenergy.com
701-347-1602

Economics – 5 Skid Project

SETUP	Per Location	# Locations	Total Setup Fee
BX Setup Fee	$200,000	5	$1,000,000

Gross Gas Volume (inlet)	675	3,375	mcfpd	101,250	mcf/month
Net Gas Volume (a/ fuel, shrink, etc.)	500	2,500	mcfpd	75,000	mcf/month
BOE Equivalent of Net Gas Volume		625	boepd	18,750	boe/month

PRODUCER COSTS		Unit Rate/Mo	Quantity	Fees, Monthly	$/mcf
BX Equipment Fees*					
BX Booster Compressor Skids		$4,000	5	$20,000	$ 0.27
BX Tube Containers	1.2	$3,150	6	$18,900	$ 0.25
BX Hose/Connector Sets		$500	6	$3,000	$ 0.04
BX Letdown Skids		$1,000	1	$1,000	$ 0.01
* Includes maintenance					
	Sub Total - BX Equipment			$42,900	$ 0.57
Third Party Equipment Fees					
Primary Compressor Skids		$7,000	5	$35,000	$ 0.47
Line Heaters		$5,000	1	$5,000	$ 0.07
	Sub Total - Other Equipment			$40,000	$ 0.53

Transportation Cost	hrs/load	mcf/load	loads/day	hrs/day	$/hour	Trucking, Monthly	$/mcf
Trucking	3.0	125	20	60	$120	$ 216,000	$ 2.88

PRODUCER MARGIN			Total Cost, Monthly	$/mcf
Total Producer Cost			*$298,900*	*$ 3.99*
	Price $/mcf		Total Rev, Monthly	
Producer Revenue (gas and liquids)	$8.00		*$600,000*	*$ 8.00*
Producer Profit Margin			***$301,100***	***$ 4.01***

PRODUCER ECONOMICS					
Investment	Year 1	Year 2	Year 3	Year 4	Year 5
($1,000,000)	$3,613,200	$3,613,200			
ROR:	343%				

tmaloney@bxenergy.com
701-347-1602

Summary – Dense Phase Transport

- Nature of Stranded Gas Production
  - The nature of gas production is complex and variable…especially from horizontal flowing oil wells…solutions must target their “sweet spot”.
- Dense Phase Transport
  - Compression technology is most economic method to capture stranded associated gas and liquids before pipelines arrive.
  - Sweet spot is early life wells, or multi-well pads, with higher gas flowrates.
  - Requires a pipeline tap within 50 miles for unloading/sales.
- Economics
  - Due to high liquids content, rich gas is valuable ($8-12/mcf), hence, economics are very attractive.
  - For example, a 5 skid project costs $1mm in setup fees and then yields a profit margin of $4/mcf…for an ROR of >300%.

tmaloney@bxenergy.com
701-347-1602

BEOWULF N-FLEX (BNF)

North Dakota Pipeline Authority Webinar

December 18, 2012

Legal Disclosure

This presentation is being provided for discussion purposes only. This presentation has been prepared solely for the use of the intended recipient and may not be reproduced, distributed or used for any other purpose without the prior written consent of Beowulf Energy LLC. The information contained herein is proprietary and confidential and may contain commercial or financial information of Beowulf Energy LLC or its affiliates.

The information presented is intended to be a summary only and is not intended to be an offer to sell or the solicitation of any offer to purchase any security or investment product. Past performance of the members of the Beowulf management team and Beowulf Energy LLC or any other investments described herein are provided for illustrative purposes only and are not necessarily indicative of future investment results. Benchmarks are shown for illustrative purposes only and have limitations when used for comparison or other purposes because they may have volatility, credit, or other material characteristics that are different from the investment opportunity. There can be no assurance that the investment opportunity will achieve comparable results, be able to implement its investment strategy or be able to avoid losses. Any statements regarding future events constitute only subjective views or beliefs, should not be relied on, are subject to change due to a variety of factors including fluctuating market conditions, and involve inherent risks and uncertainties, both general and specific, many of which cannot be predicted or quantified and are beyond the control of Beowulf and its affiliates.

Any investment contemplated herein involves a degree of risk, and there is no guarantee or assurance that the investment opportunity will achieve its investment objectives. An investment contemplated herein is speculative and should form only part of a complete investment program, and an investor must be able to bear the loss of its entire investment. *As such, you are urged to consult a professional advisor regarding the possible economic, tax, legal, or other consequences of entering into any investments or transactions described herein.*

The information contained herein does not constitute any representation or warranty with respect to Beowulf Energy LLC or its affiliates, and no person has been authorized to make any such representation or warranty.

Beowulf N-Flex Overview

- Beowulf Energy LLC ("Beowulf"), the controlling affiliate of Beowulf N-Flex, is a private company focused on the acquisition and development, construction and operation of energy infrastructure facilities worldwide
- Beowulf is headquartered in Easton Maryland and has offices in Colorado, Montana, New York City, Port of Spain, Trinidad, and Istanbul, Turkey
- Beowulf's abilities in the Williston Basin
  - Financial Liquidity: Providing capital for drilling /development
  - Services: through our O&M company and acquisitions
  - Resource recovery: N-Flex mobile NGL recovery and ammonia production

Beowulf is an experienced energy infrastructure investor and project developer and is well positioned to add value in the Williston Basin

Beowulf N-Flex ("BNF") Advantage

- **Proprietary Technology**: BNF's proprietary small-scale N-Flex units efficiently recover NGLs and convert the methane and ethane into anhydrous ammonia to be used locally for fertilizer.
- **Maximum Recovered Value**: BNF has the unique ability to monetize the full gas stream -- recovering the maximum volume of NGLs as Y-Grade and converting the lighter hydrocarbons into fertilizer.
- **Additional Local Benefits**: Beyond recovering NGLs and reducing flaring waste, BNF brings added value by producing value-added ammonia fertilizer in North Dakota where its needed while minimizing transportation and logistics expense and stress on ND's system.
- **Financial Strength to Perform**: BNF is able to deploy equipment and manage the NGL recovery and ammonia production at no cost to the producer. Producers can focus on their core business while benefiting from new revenue stream.

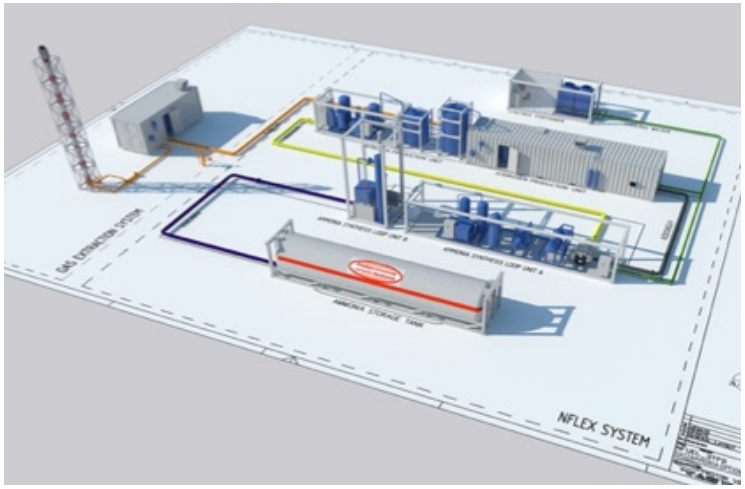
BNF provides a comprehensive solution to flaring in North Dakota, monetizing the entire gas stream and creating much needed supply of high value fertilizer

Beowulf N-Flex: NGL Recovery and Distributed Ammonia Production

- Haber Bosch process optimized for small scale and flexible feedstocks
- Fully automated process for safe operation
- "Micro N-Flex" A3 Mobile Skid-mounted units (1,100 tons per year)
- "Mini N-Flex" A60 Modular units (22,000 tons per year)
- Long operating life
  - Ammonia reactor 30 year life
  - H_2 & N_2 units rated min. 20 years
- World-class partners for components

Three N-Flex "Mini" Units in operation today

N-Flex A3 "Micro" Unit

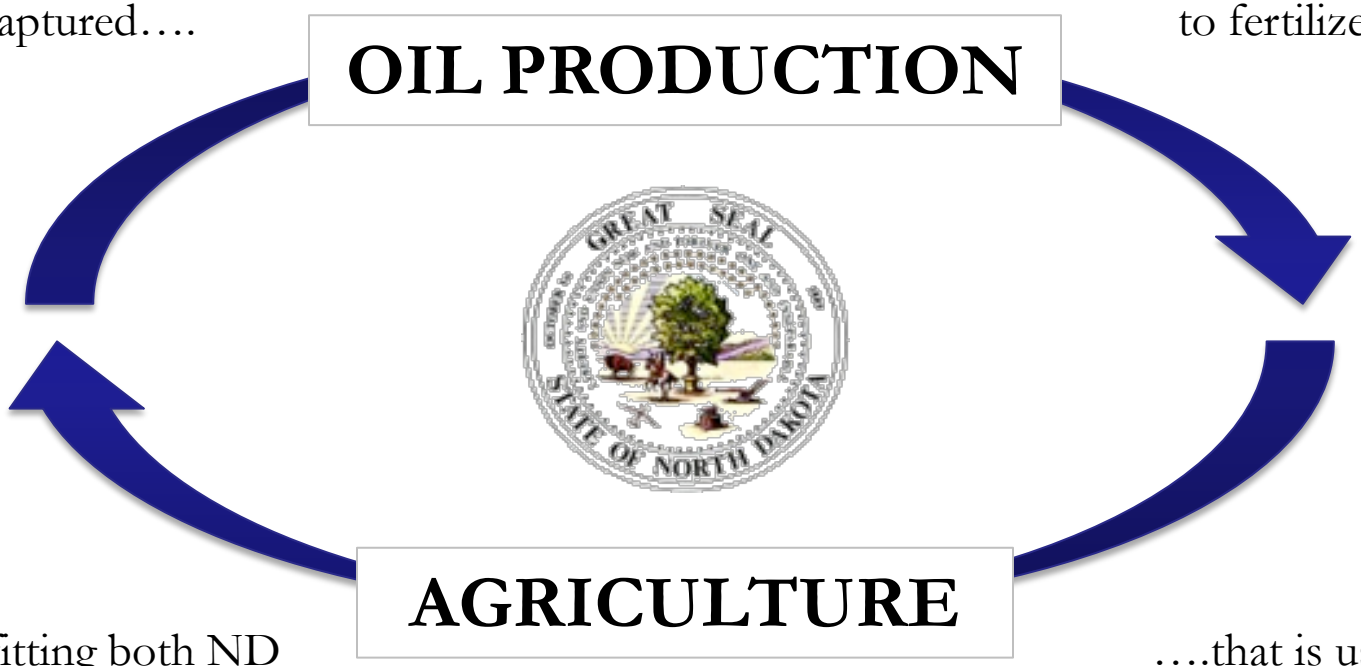


BNF holds the exclusive rights to small scale N-Flex ammonia production technology

Beowulf N-Flex Strengthens North Dakota's Top Two Industries

NGLs recovered and gas is captured….

….and converted to fertilizer…



…benefitting both ND agriculture and ND oil.

….that is used to fertilize ND crops…

N-Flex technology uses stranded ND resources to meet local demand for fertilizer, thereby strengthening ND's top two industries simultaneously

State of US Ammonia Markets

- US Producers suffered losses from spiking natural gas prices and couldn't compete with international market
- 40% of US Ammonia production capacity has been dismantled since 2000 (from 20 million tpa to 12 million tpa)
- Construction of new world scale plants would require several years and up to $2 billion each
- Developing world demand has soared and China is now taxing Nitrogen exports
- The US now imports over 60% of our Nitrogen needs
- Infrastructure is inadequate to transport ammonia and supply has been irregular with volatile price fluctuations
- North Dakota farmers that depend on ammonia fertilizer have faced supply shortages and extreme price spikes

New localized fertilizer production capacity is critical to ensure supply security and price stability for US farmers, especially in the Midwest.

Beowulf N-Flex Converts Environmental Risk to Economic Opportunity

FLARE GAS

200,000 mmbtu gas flared **daily** in ND = equals 4.5 million tons of CO2 or about 843,000 cars

FERTILIZER

Utilizing just 15% yields 331,000 tons of ammonia to supply North Dakota and displace imports

Converting just 15% of gas currently flared in ND would create approximately $100 million EBITDA annually

Source: BNF estimates

Beowulf N-Flex Mobile A3 Units: Wellhead Deployment

A3 Units produce 1,100 tpa of ammonia and capture value from NGLs and CH4

STEP 1
NGL Recovery

- NGL recovery units deployed quickly to recover maximum flow
- NGLs are sold to local pipelines and processors
- Revenues from high value products shared with producer

STEP 2
Ammonia Production

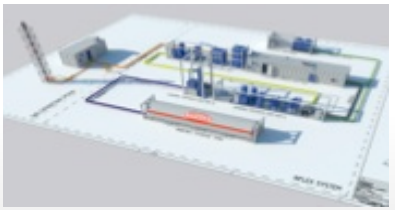
- A3 Unit uses light hydrocarbons after NGL knockout
- Methane/Ethane mix at optimal ratio for N-Flex intake
- Gas also provides onsite power and runs compressors

N-Flex Mobile A3 Units monetize the entire well-head gas stream

Beowulf N-Flex Highlights

Large market opportunity & ability to drive new market opportunities

Distributed production uses low value feedstock to meet high-value markets



Proven technology & ability to be low cost producer in key markets

Solves a key environmental challenge while benefitting multiple stakeholders

Strong partners in key segments of value chain

Beowulf N-Flex LLC

575 Broadway
3rd Floor
New York, NY 10012

Neil Cohn

(917)392-8500

neilcohn@beowulfenergy.com

BLAISE ENERGY
Tomorrow's Energy Solutions

Prepared For:

NDPA Natural Gas Flaring Alternatives Webinar

December 18, 2012

- **North Dakota Based Company**
- **Founded in 2008**
- **Mission: Provide market-based solutions to monetize stranded gas through distributed gas processing solutions.**

Blaise Energy
Gas Monetization Solutions

1. Grid Power
2. Site Power
3. Micro-Grid / Private Electrical Grid
4. NGL Recovery
5. Gas to Liquids - Methanol

Grid Power

Blaise initially launched a distributed generation service producing electricity directly at the flaring source for sale into the electrical grid ("Grid Power").

Blaise is the 1st company in North America to generate externally verified RECs (Renewable Energy Credits) from recycling flared gas.

"Grid Shack" – All electronics & breakers to parallel to grid

Blaise paralleled generators, switch gear and custom gas processing equipment in operation

Site Power

- Expertise with Gas Engines
- Faster to Deploy
- Easier to Deploy

Diesel Generation → **Gas-Powered Generation**

Two primary forces are driving this:

Economics
- More affordable source of site power
- Eliminates the need to truck in diesel

Emissions
- Emissions from natural gas generator is lower than diesel.
- Increasing state and federal pressure on the oil and gas industry to reduce emissions

Paralleling Expertise – Size Generation to Load

Micro Grid

Blaise quickly expanded into larger site power requirements by powering larger private electrical loads.

Blaise is supplying all power requirements from natural gas for a newly constructed gas processing plant in North Dakota.

Blaise is actively pursuing additional industrial Micro-Grid applications

Natural Gas Liquids

Blaise participated in a pilot project with a strategic partner to deploy our first NGL service

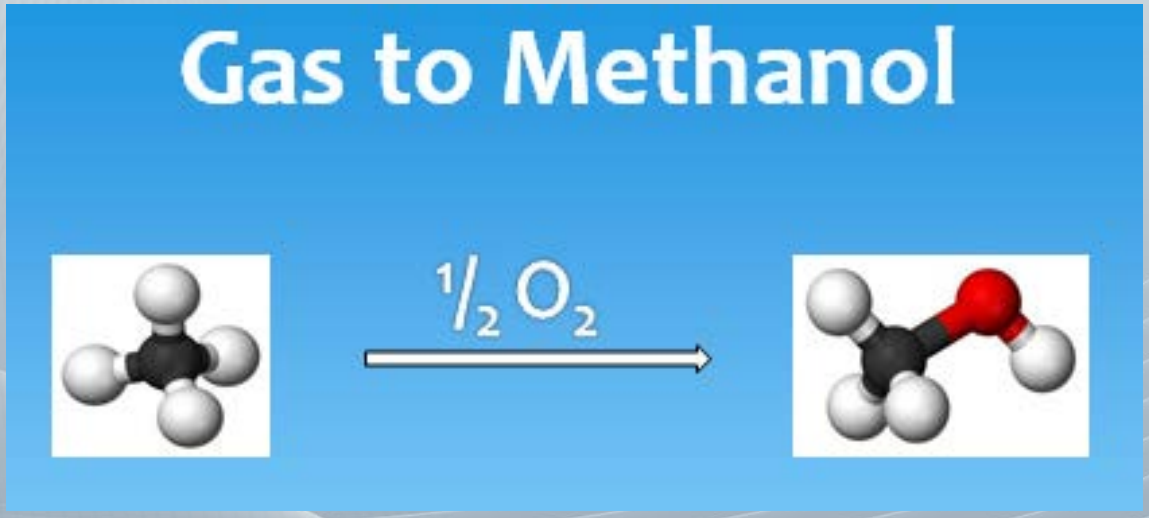
Having participated in a successful pilot project, Blaise is in active discussions with additional Operators to launch a more mobile micro-processing service

Gas to Liquids - Methanol Production

Blaise Energy is partnered with the University of North Dakota's (UND) Institute for Energy Studies (IES) to develop a polygeneration facility that will turn residue gas from NGL knockout to produce Methanol

- Together with its partners, Blaise will produce a mobile, trailer-mounted equipment to make the gas to Methanol conversion

- Site Identified – Access to large volume of methane from post NGL knockout



For More Information

address 618 North 5th St. | Bismarck, ND 58501
email Mark@BlaiseEnergy.com
web www.BlaiseEnergy.com
twitter https://twitter.com/BlaiseEnergyInc
phone 701.390.7543

EXPANSION ENERGY

DRESSER-RAND

"VX™ Cycle"

Mobile, Ultra-Small-Scale LNG Production Plants

North Dakota Pipeline Authority

Gas Flaring Solutions Webinar

December 18, 2012

"VX Cycle" Technology & Manufacturing Partnership

Expansion Energy LLC

- Created & patented the VX Cycle technology
- Energy technology development firm
- Core technological expertise:
  - Cryogenics
  - Processing of gases
- Business model: Technology licensing
- HQ: Tarrytown, NY
- Satellite office: Bismarck, ND
- Technology portfolio (partial)
  - Liquefied natural gas (LNG) production
  - Non-hydraulic fracturing technology (avoids use of water & chemicals)
  - Utility-scale power storage
  - Carbon capture & sequestration
  - Coal ash (CCR) processing / clean-up

www.expansion-energy.com

Dresser-Rand Co.

- Licensed VX technology from Expansion Energy to build & sell VX Cycle plants
- Leading global manufacturer of rotating equipment for oil & gas, petrochemical, power and process industries
- $4 billion market cap (NYSE: DRC)
- ~ 7,000 employees; ~ 3,000 engineers
- 100+ year-old company
- HQ: Houston, TX & Paris, France
- Manufacturing and R&D in 8 countries
- > 100,000 products operating worldwide
- Strong after-sale repair & maintenance
  - 49 service centers covering 140 countries
- Strong presence in Williston Basin

www.dresser-rand.com

EXPANSION ENERGY

DRESSER-RAND

Patented "VX Cycle" Technology Overview

- The only mobile LNG production technology in the market
  - Trailer-mounted or skid-mounted
  - Factory-built / turnkey
  - Fully functional within days/weeks of arrival at deployment site
- Ultra-small-scale LNG production
  - As low as 1,500 gallons/day (GPD)
  - Far smaller than competing technologies

- A methane expansion cycle – methane is both the product and the refrigerant
- Gas-to-LNG efficiencies of ~ 75% to 85%, depending on scale and gas pressure
- Produces its own power ➡ No connection to the electrical grid is required
- Can be fully automated ➡ No continuous labor required
- Optional "bolt-on" additions for separating NGLs (propane, butane, etc.) from the feed gas ➡ Uses the deep refrigeration inherent in the VX Cycle

EXPANSION ENERGY

DRESSER-RAND

"VX Cycle" Applications

Upstream

- Monetize associated gas at oil wells
  - Eliminate gas flaring
- Separate NGLs from feed gas (with optional "bolt-on" units)
- Stranded gas fields w/o pipelines
- LNG fuel to replace diesel for:
  - Drilling rigs
  - Hydraulic fracturing pumps
  - Field trucks
  - Construction equipment
  - Distribution to nearby retail LNG fueling stations
- Offshore oil & gas platforms

Midstream

- Peak-shaving gas storage facilities
- LNG for shipping to remote communities
- LNG for shipping to remote industrial & mining sites

Downstream

- "Distributed" production of vehicle-grade LNG at fueling stations (replaces diesel fuel)
- Eliminates the need to truck LNG from large, centralized plants to distant fueling depots
- Upgrade existing CNG stations
- Clean, inexpensive LNG fuel for:
  - Long-haul/heavy-duty trucks
  - Delivery fleets
  - Railroad locomotives
  - Marine (ships/barges/ferries)
  - Construction & mining equipment

EXPANSION ENERGY

DRESSER-RAND

"VX Cycle" Advantages

- Mobility – trailer-mounted or skid-mounted plants
- VX methane expansion cycle provides:
  - High efficiency – uses an optimal balance of refrigeration & compression + uses waste heat/cold
  - Low capital cost
  - Low operating costs
- Simplifies LNG production vs. other LNG technologies such as: Mixed Refrigerant Cycles / Nitrogen Cycles / Cascade Cycles
  - Less complex equipment
  - Fewer process inputs (e.g., no separate refrigerants to ship in; no "make-up" refrigerants)
  - Less sensitive to ambient temperatures
- Can utilize virtually any high- or low-pressure feed gas
  - Pipeline gas from local gas distribution systems or interstate pipelines
  - Well gas
- Small, modular VX plants allow for incremental expansion with low capital risk
  - Use of multiple modules ensures a higher % of uptime

Product Roll-out

- Dresser-Rand has exclusive technology license for VX plants up to 100,000 GPD
- Initial standard VX plants from Dresser-Rand will produce ~ 6,000 GPD of LNG
  - Larger and smaller scales will follow
- VX Cycle plants will hit the market in ~ Q3 2013
  - Market interest is high
  - Interested customers are advised to contact Dresser-Rand soon to assure a spot in the queue
- Dresser-Rand plans to rapidly expand its manufacturing capacity for VX plants
  - By 2014, VX plants can be delivered within months of order (not years)
  - VX plants utilize existing Dresser-Rand components: Compressors; Gas Engine Gen-Sets; etc.
- Initial VX pricing is targeted at $900 to $1,000 per GPD of production capacity
  - Larger capacity units may be priced lower (per GPD of capacity)
  - Allows for short payback periods and high ROI in most market circumstances
- Dresser-Rand will offer performance guarantees + full-service maintenance & repair programs
  - With proper maintenance, VX Cycle lifetimes are anticipated to be 20+ years

Contact Information

Expansion Energy LLC

Jeremy Dockter
Co-Founder & Managing Director
Email: jdockter@expansion-energy.com
Phone: 917-653-5418

David Vandor
Co-Founder & Chief Technology Officer
Email: dvandor@expansion-energy.com
Phone: 914-631-3197

www.expansion-energy.com

Dresser-Rand Co.

VX Cycle Business Unit
Phone: 800-372-2608

www.dresser-rand.com

G2G SOLUTIONS

Flare Gas Solutions & Service

Prepared for:

NDPA Natural Gas Flaring Alternatives Webinar
December 18, 2012

Prepared by:

G2G Solutions, LLC
404 North 31st Street
Suite 227
Billings, MT 59101

G2G Mission Statement

"G2G Solutions is dedicated to creating environmental and economic value by providing complete solutions and service to safely reduce or eliminate flare gas."

G2G Solutions

- Founded by engineers
- Solution & service provider
- Proven technology
- Proven service model

Proven G2G Technology

- Very low temp refrigeration
- NGL recovery
- Flow control technology
- Full systems integration
- Mobile & scalable

G2G Service and Operations

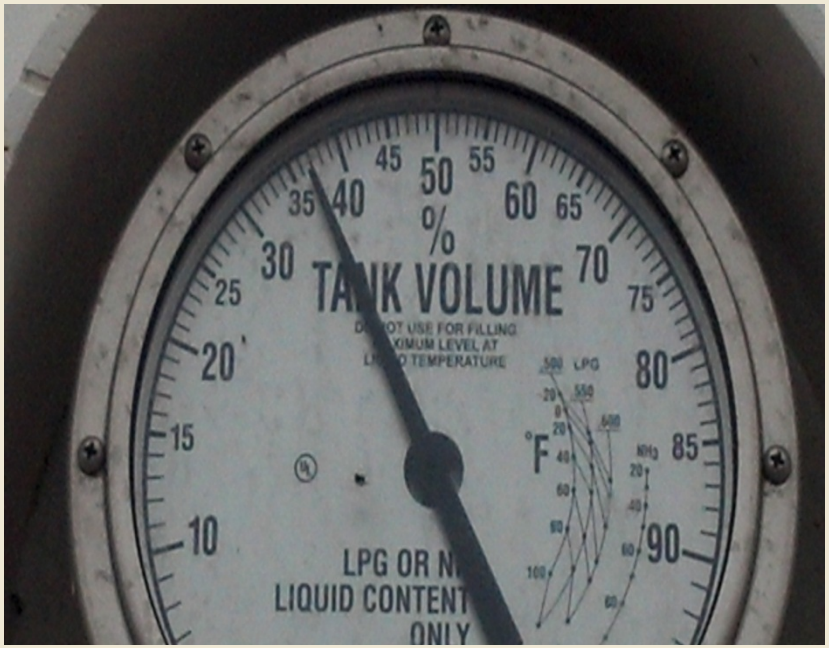
- Full service
- G2G transport
- Service infrastructure
- First production
- Other technology

G2G Safety

- ISNetworld approved
- No lost time accidents
- Redundant safety systems

G2G Results

- VOC and CO2e reduction
- Create value from waste stream
- Complimentary technology



The G2G Advantage

- Proven systems & service TODAY
- No producer staffing required
- SOLUTIONS is in our name

For more information on G2G Solutions, please contact:

Brian Cebull

(406)867-6700

bcebull@g2g-solutions.com

www.g2g-solutions.com

***LPP* = *L*ean, *P*remixed & *P*revaporized**

Well-site Power Systems - NGLs and Wet Gas

December 2012

8940 Old Annapolis Road, Suite K
Columbia, MD 21045
(410)884-3089
www.lppcombustion.com

What Is LPP Combustion, LLC?

- **LPP Combustion Is a Fuel Technology and Equipment Supplier Providing Clean Energy Solutions**
  - **Tested and Patented Technology**
  - **Converts Liquid Fuels Into A Substitute Natural Gas**
  - Applicable For **Gas Turbines**, **Reciprocating Engines** (Tug Boats, Locomotives, Power Generation), **Duct** and **Boile**r Burners

- **Spin-Out From Combustion Science & Engineering, Inc.**
  - Consulting Services To Global 100 (Caterpillar, GE, Siemens)
  - Consulting Services To U.S. Government (NSF, DOD, NIST)
  - Expertise in Combustion and Fire Science Applications

LPP* = *Lean, Premixed & Prevaporized

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

Opportunity

Use low-cost, local fuels to replace expensive diesel fuel.

- **Reduce E&P costs of operators.**
- **Produce on-site power for remote locations.**
- **Reduce the number of trucks on the roads.**
  - 41% increase in highway fatalities in North Dakota in 2011 (NHTSA)
  - 148 deaths
  - 10% increase in vehicle miles traveled

***LPP* = *L*ean, *P*remixed & *P*revaporized**

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

LPP Benefits

- **Use raw, untreated gas from the well-head**
  - No need to separate liquids from the fuel stream
  - Use total energy content of the available NGLs on-site
  - No need to truck away NGLs
- **Accommodate varying fuel-stream composition & heating value**
  - Handles hot-burning higher-hydrocarbons (C2 – C8)
- **Move the portable power system from well to well**
- **Range of system sizes powers many applications:**
  - Drilling / Hydraulic Fracturing / Enhanced Oil Recovery (EOR)
- **Low emissions power generation with liquid fuels**
- **Produce hot water / steam on-site**

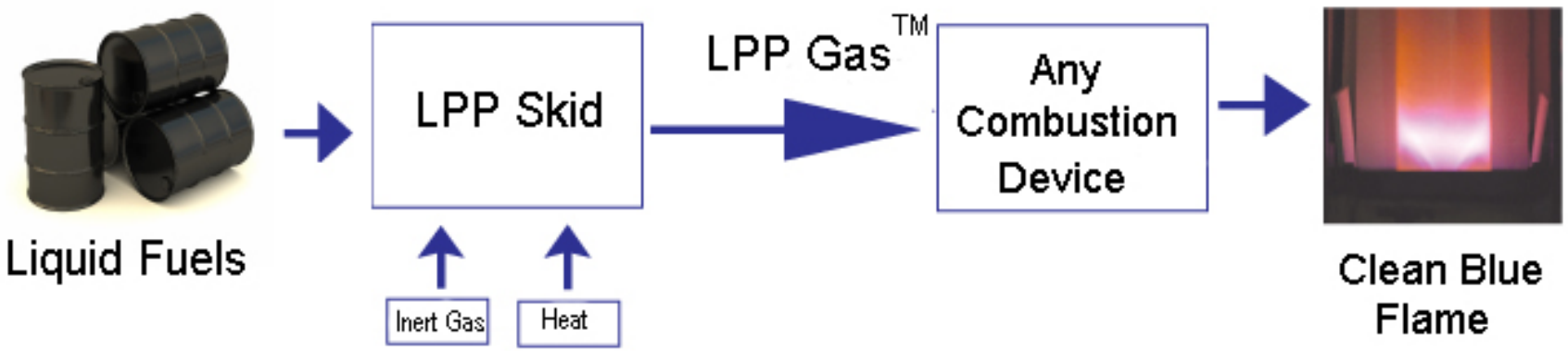
LPP* = *Lean, Premixed & Prevaporized

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

The Patented Solution

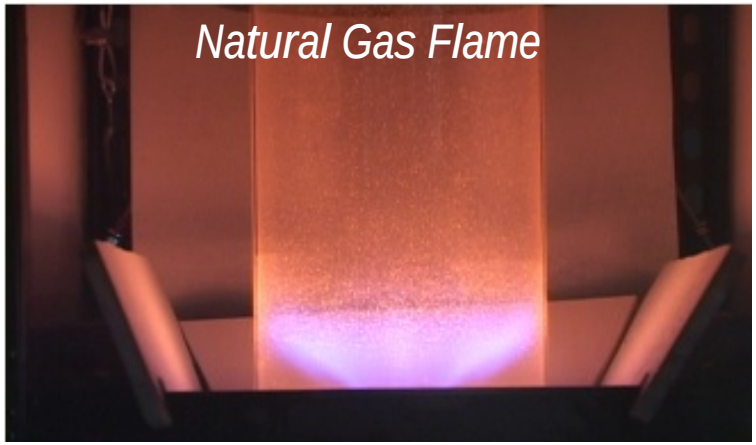
LPP = Lean, Premixed & Prevaporized

- The LPP Combustion System Vaporizes Liquid Fuels And Creates A Substitute Natural Gas (LPP Gas™)
- This LPP Gas™ Can Then Be Burned With Low Emissions In Place Of Natural Gas In Virtually Any Combustion Device
- Burning Biodiesel, The LPP System Creates A Low-Emissions, Renewable Energy Power Plant With No Net CO_2 Gas Emissions



The Result

Same Gas Turbine Combustion System



The LPP System Provides Clean Energy from Liquid Fuels:

- **Provides Flexible Liquid Fuel Source While Reducing Emissions, Meeting or Exceeding Environmental Requirements**
- **Process Uses Existing Equipment and Infrastructure**
- **Reduces Equipment Maintenance Cost**
- **Provides Rapid Customer Payback**

LPP* = *Lean, Premixed & Prevaporized

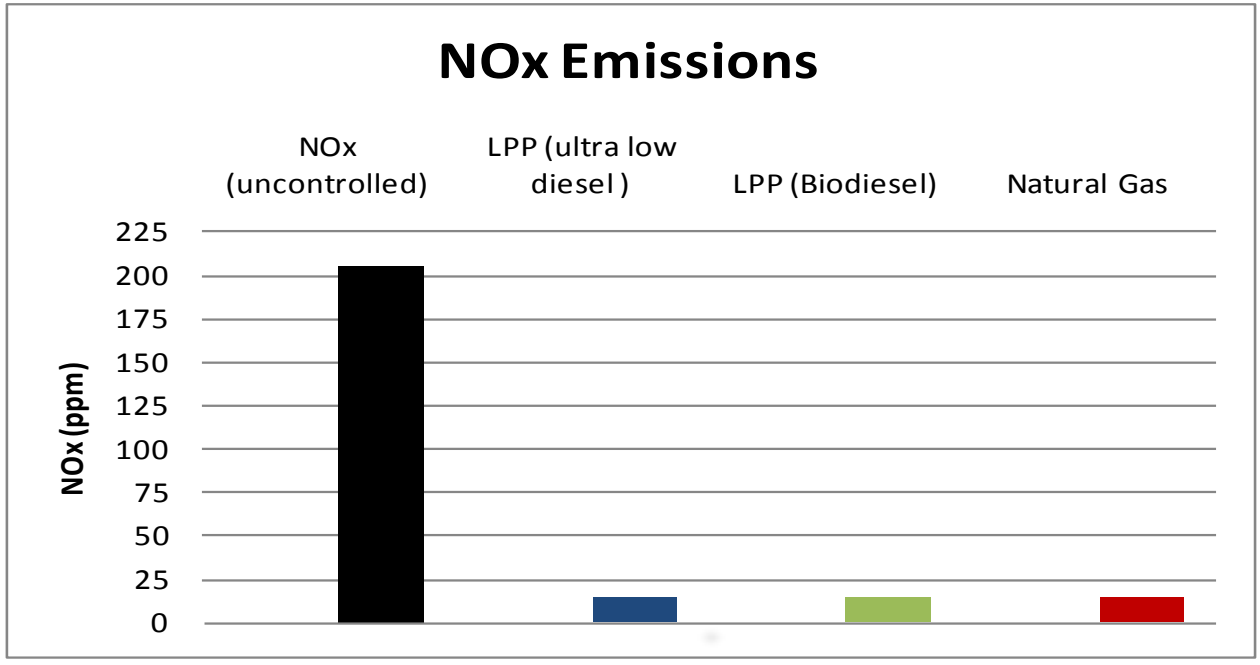
US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

LPP is Liquid Fuel Agnostic

- Y-grade / NGLs
- Wet Gas
  - Natural gas + NGLs
- No. 2 Diesel Fuel Oil
- Gasoline
- Kerosene
- No. 2 Heating Oil

LPP Emissions Performance

- *Utilize any light liquid fuel to produce synthetic natural gas*
- *Criteria pollutant emissions (NOx, CO, & PM) reduced by 90%*
- *NOx, CO, SOx, & PM comparable to natural gas emission levels*
- *Use existing natural gas burners w/o combustor hardware modifications*



The LPP System reduces NO_x emissions without increasing CO emissions

***LPP* = *L*ean, *P*remixed & *P*revaporized**

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

Scaling of LPP Technology

- LPP Technology Demonstrated Over Four Orders of Magnitude
- LPP is a Fuel Technology that is Inherently Scalable
- Modular Design Easily Expandable
- No Technical Barriers to Scaling of LPP System to Larger Applications
- System Can Be Sized for:
  30 kW (microturbine) to
  230 MW (Utility turbine)
- Pricing will vary with scale: $100 (large system) - $300/kW (small system)

Solar Turbines Taurus 60 Mobile Gas Turbine System
(Photo courtesy of Solar Turbines)

LPP NGL 3000 Power System

Acme Power Systems

6990 Columbia Gateway Drive; Ste. 250
Columbia, MD 21046
Tel: 443.516.1317
APSSales@acmepowersystems.com
www.AcmePowerSystems.com

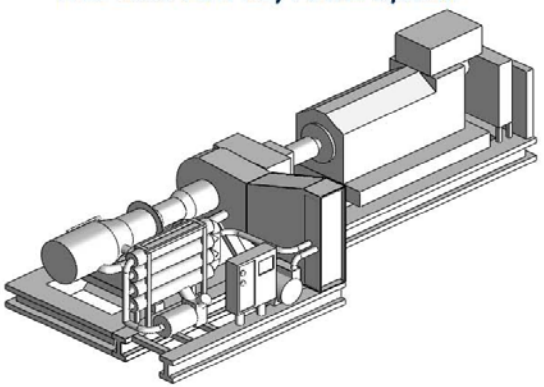
NGL 3000

Multi-Fuel, Mobile Power for the Oil & Gas Industry

The NGL 3000 Power System operates on C1-C8 fuels to provide 3400 kW of electric power with natural gas emission levels. The NGL 3000 can optionally be configured as a Combined Heat & Power (CHP) system to also produce hot water or steam.

NGL Power Systems use industry standard, robust gas turbines configured to generate power using well-head gas, natural gas, and natural gas liquids (NGLs) ranging from ethane and Y grade to natural gasoline without the need for diesel fuel. The NGL Power Systems can be deployed in stationary applications or truck-mounted for mobile applications and ruggedized for severe weather.

NGL 3000 Turn-Key Power System



System features include:

- Up to 3400 kW continuous electric power
- Combined Heat & Power (CHP) option for hot water or steam
- Solar Centaur 40 Gas Turbine
- Lower maintenance cycles & cost
  - High performance
  - Rapid load-following
- 100% operation on wellhead gas, NGLs, Y grade
- On-the-fly fuel switching & blending
- No diesel fuel required
- Natural gas level emissions across fuel blends
- Mobile & Stationary installations
- Ruggedized option for severe weather

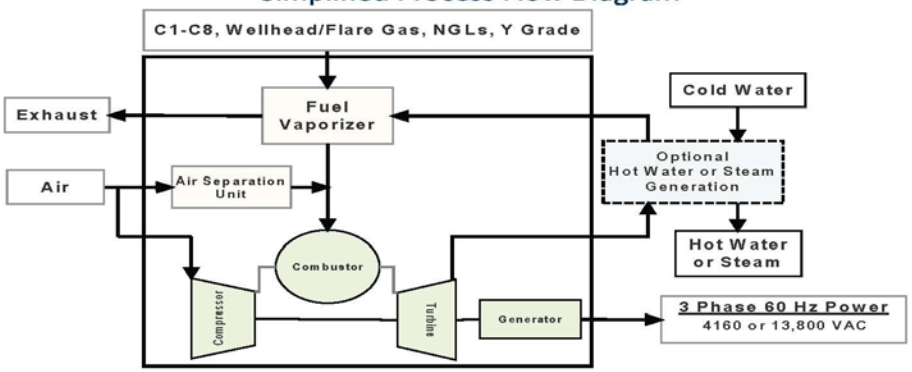
Acme Power Systems

6990 Columbia Gateway Drive; Ste. 250
Columbia, MD 21046
Tel: 443.516.1317
APSSales@acmepowersystems.com
www.AcmePowerSystems.com

NGL 3000

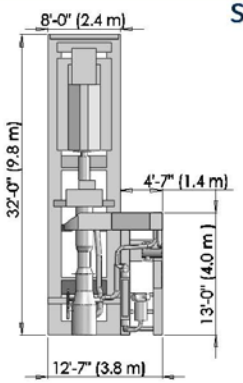
Multi-Fuel, Mobile Power for the Oil & Gas Industry

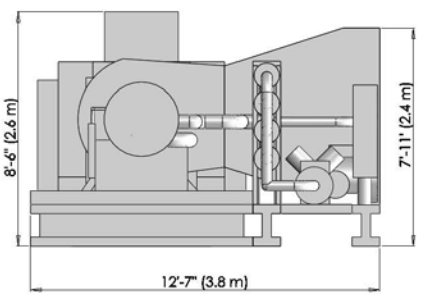
Simplified Process Flow Diagram



- Electric Output: 3400 kW
- Fuel Type: C1 - C8 wellhead/flare gas, NGLs, Y Grade
- Steam: 18,000 lbs/hr., 150 psig/sat.
- Inlet Water Temperature: 55F
- Hot Water Temperature: 180F
- Hot Water Flow Rate: 500 gpm

System Dimensions





***LPP* = *L*ean, *P*remixed & *P*revaporized**

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

LPP NGL 200 Power System

Acme Power Systems

6990 Columbia Gateway Drive; Ste. 250
Columbia, MD 21046
Tel: 443.516.1317
APSSales@acmepowersystems.com
www.AcmePowerSystems.com

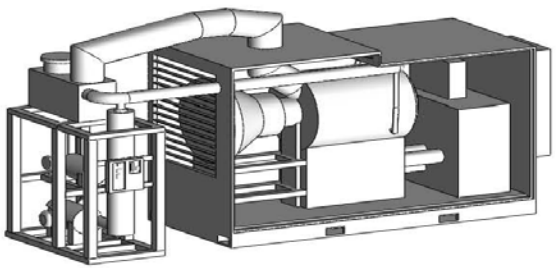
NGL 200

Multi-Fuel, Mobile Power for the Oil & Gas Industry

The NGL 200 Power System operates on C1-C8 fuels to provide 200 kW of electric power with natural gas emission levels. The NGL 200 can optionally be configured as a Combined Heat & Power (CHP) system to also produce hot water.

NGL Power Systems use industry standard, robust gas turbines configured to generate power using well-head gas, natural gas, and natural gas liquids (NGLs) ranging from ethane and Y grade to natural gasoline without the need for diesel fuel. The NGL Power Systems can be deployed in stationary applications or truck-mounted for mobile applications and ruggedized for severe weather.

NGL 200 Turn-Key Power System



System features include:

- Up to 200 kW continuous electric power
- Combined Heat & Power (CHP) option for hot water
- Capstone C200 Gas Turbine
  - Lower maintenance cycles & cost
  - High performance
  - Rapid load-following
- 100% operation on wellhead gas, NGLs, Y grade
- On-the-fly fuel switching & blending
- No diesel fuel required
- Natural gas level emissions across fuel blends
- Mobile & Stationary installations
- Ruggedized option for severe weather

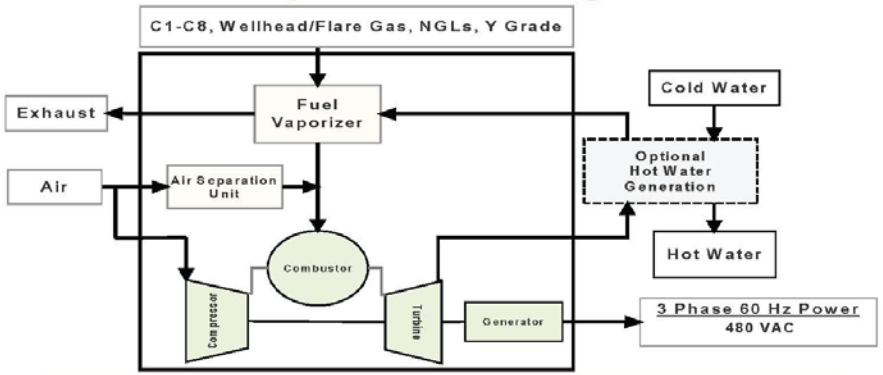
Acme Power Systems

6990 Columbia Gateway Drive; Ste. 250
Columbia, MD 21046
Tel: 443.516.1317
APSSales@acmepowersystems.com
www.AcmePowerSystems.com

NGL 200

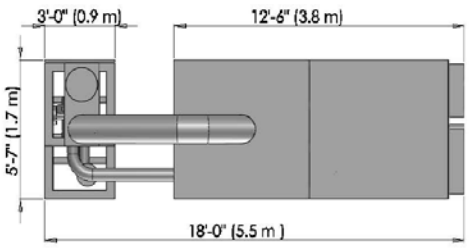
Multi-Fuel, Mobile Power for the Oil & Gas Industry

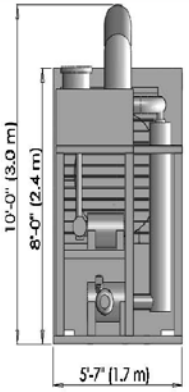
Simplified Process Flow Diagram



- Electric Output: 200 kW
- Fuel Type: C1 - C8, wellhead/flare gas, NGLs, Y Grade
- Inlet Water Temperature: 55F
- Hot Water Temperature: 180F
- Hot Water Flow Rate: 50 gpm

System Dimensions





***LPP* = *L*ean, *P*remixed & *P*revaporized**

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

LPP NGL Power Systems

- **Power Generation Capacity**
  - 200 kW Capstone C200
  - 400 kW Capstone C200 X 2
  - 600 kW Capstone C200 X 3
  - 1 MW Capstone C1000
  - 3.4 MW Solar Turbines Centaur 40
  - 5.6 MW Solar Turbines Taurus 60
  - 29.5 MW GE TM2500+

- **Fuel Cost**
  - $0 (Flare Gas)
  - $10 - $22/bbl (Y-grade) = $0.25 - $0.52/gallon
    - **Y-grade ($10/bbl) is half the cost of natural gas**
    - **$1.75 MBTU (Natural Gas = ~$3.50 Henry Hub + transport costs)**

- **Combined Heat and Power (CHP) Configuration**
  - Produce process heat / hot water /steam

LPP* = *Lean, Premixed & Prevaporized

US Patents: 7,089,745 & 7,322,198. Other Patents Pending.

Contact

Chris Broemmelsiek
VP - Sales & Marketing
LPP Combustion

info@lppcombustion.com

(410)884-3089

www.lppcombustion.com

Solution to Substantially Reduced Flare Rates in the Williston Basin
Presented by

ALTERNATIVE GAS PROCESSING, INC.

BETTER by DESIGN

in Partnership with

TUCKER GAS PROCESSING EQUIPMENT INC.

and

NGL Energy Partners LP

WHAT DO WE DO?

- We supply state of the art membrane systems to recover 95% to 97% of the gas streams currently being flared.
- These are furnished at no out of pocket expense to the producer.
- Gathering systems(if necessary) can be furnished to bring gas streams to central processing points to facilitate transportation of the processed pipeline quality methane, and Y-Grades liquids to suitable pipelines and railheads for delivery to market.
- We directly market and transport the products for the producer.
- Flares are reduced primarily to ethane.

HOW DO WE DO IT?

We furnish a state of the art field membrane processing plant.

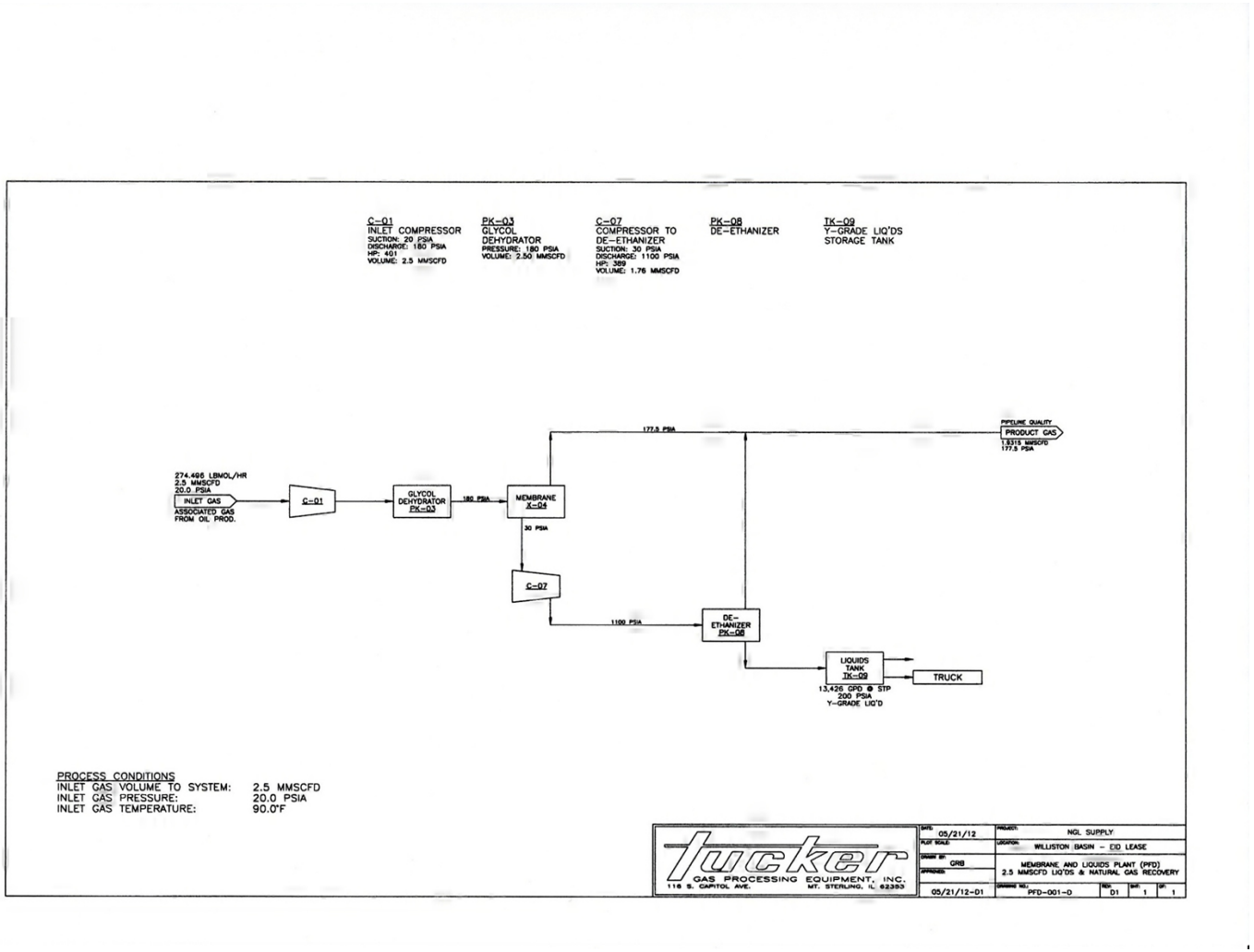
- ***Advanced Technology for High Efficiency NGL Recovery***

- **Nitrogen, Carbon Dioxide, & Natural Gas Liquids Membrane Removal Technology, utilizing the newest generation of non-hydroscopic membrane materials, offers significant advantages for either low or high volume removal of contaminates from natural gas streams. Membrane systems are essentially passive in operation with virtually none of the high maintenance and operating costs associated with conventional Amine Plants, Pressure Swing Absorption Plants, Joule-Thompson Natural Gas Liquids Plants, or Natural Gas Liquids Refrigeration Plants.**

- **Alternative Gas Processing, Inc. in cooperation with Tucker Gas Processing Equipment, Inc., our engineering, design, and fabrication partner, offers an innovatively designed membrane system, providing exceptionally high efficiency and a proportionately low volume waste gas stream (significantly lower than conventional technology). These proprietary membranes are not conventional cellulose fiber membranes. "Poly ether ether ketone" is a chemically resistant, specialty, high performance engineered plastic. It offers the significant advantage of rendering the membrane cartridges non-hydroscopic. And, as such, makes them completely resistant to water, to the degree of making glycol dehydrators virtually redundant in the field. This innovative product allows us to offer separate, or combined, Membrane Systems for the separation of Natural Gas Liquids, removal of Carbon Dioxide or Hydrogen Sulfide, separation of Nitrogen, and removal of water from Natural Gas Hydrocarbon Streams simultaneously.**

- **A second advantage of our system, where Natural Gas Liquids are involved, is that by use of the Membrane we make an initial separation of the liquids producing a suitable Y-Grade mix for fractionation. This allows us to significantly reduce the footprint of the much smaller JT plant or De-ethanizer if necessary, and then make the final separation between the Natural Gas Liquids and the remaining Methane & Ethane for maximum liquids recovery. The resulting pipeline quality gas stream can then be recycled back to the main sales gas product stream. This technique substantially reduces the energy requirements for the entire system, as well as its overall size. Being skid mounted, the equipment can be set in train for virtually any volume of product to be recovered. At the end of well productivity, the units are easily relocated to another site.**

Process Flow Diagram of Membrane System




NGL
Energy Partners LP

NGLEP Overview

- NGL Energy Partners (NGLEP) is a growth-oriented midstream MLP with diversified operations throughout the U.S. (NYSE: “NGL”)
- NGLEP is focused on generating stable and consistently growing cash distributions through organic development and strategic acquisitions
- NGLEP has a significant presence in multiple energy segments
  - NGL Logistics
  - Crude Oil Logistics
  - Water Services
  - Retail
- Vertically Integrated
- Over 1,900 employees

NGLEP Major Terminals and Data

- Automated truck loading and unloading facilities that operate 24 hours a day
- 16.5MM gallons above ground storage
- Terminal throughput of 419MM gallons of propane projected in 2012 – 2013
- 18 proprietary terminals serving over 300 customers
- 10 terminals with rail loading capability
- 5 multi-product terminals
- Extensive customer base with over 800 wholesale customers in 42 states
- Open access to 7 common carrier pipelines

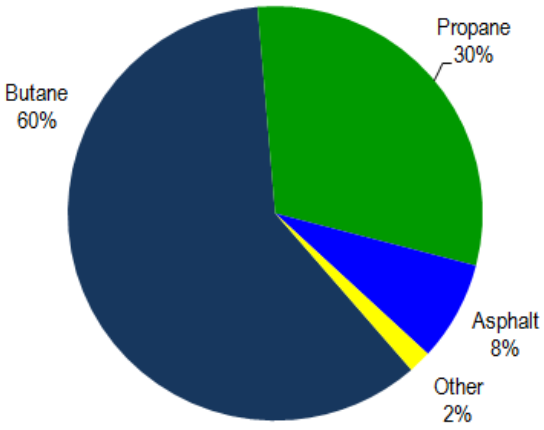
NGLEP

Service Offerings

- Transports and markets natural gas liquids (“NGLs”) to and from refiners, gas processors, propane wholesalers, petrochemical plants and other merchant users or wholesalers of NGLs
- Nationwide service offering in each of the lower 48 states and Canada is a competitive advantage relative to competitors, many of which have regionally focused operations
- Utilization of terminal storage to take advantage of seasonal price differentials
- Purchase and sale transactions are entered into on a back-to-back basis for matched aggregate exposure
- Average NGL volumes of approximately 159,000 barrels per day
- Volumes (in USG’s) are largely comprised of propane, butane, iso-butane, asphalt, and transloading
- Currently 3,081 railcars leased (NGL, Asphalt, and GP), with lease terms ranging from 3 months to 10 years. Committed to take on 1,069 newly built cars ratably across 2013 and 2014.

Product Mix & Services

(9 months ended Sep 30, 2012)



NGLEP: Bakken Presence

Products Being Serviced

- Propane, Butanes, Natural Gasoline and Crude Oil
  - Approximately 100,000 barrels per month
- Rail Facilities
  - Sidney, Montana (NGL's)
  - Donnybrook, North Dakota (Transloader for NGL's & Crude Oil)
  - Dickinson, North Dakota (Transloader for Crude Oil)
  - Williston, North Dakota (Transloader for Crude Oil)

Deal Structure

- NGLEP will:
  - Provide initial Capital
  - Build Processing Units
  - Build Gathering Lines if needed
  - Supply Compression if needed
  - Supply Field Tanks
  - Transport NGL's to Market
  - Retain a portion of the NGL's and Natural Gas Sales if any to recoup capital
- Producer Benefits
  - No capital outlay
  - Reduced or Eliminated Flare Volume
  - Value Realization from recovered NGL's and possibly Natural Gas
- First Steps
  - Well Location(s)
  - Gas Analysis
  - Wellhead Pressure (available inlet pressure to system)
  - Flow Rate of Wet Gas to be Processed

Contact Information

NGL Energy Partners, LP
Michael Duffy
6120 S Yale, Suite 805
Tulsa, OK 74136
Bus: (918) 477-0543
Mobile: (918) 607-6671
E-mail: michael.duffy@nglep.com

NGL Energy Partners, LP
Joel Hunter
6120 S Yale, Suite 805
Tulsa, OK 74136
Bus: (918) 477-0544
Mobile: (918) 688-6544
E-mail: joel.hunter@nglep.com

Alternative Gas Processing, Inc.
Van C. Kreaps
1907 Middle Glen Dr
Carrollton, TX 75007
Bus: (469) 892-5105
Mobile: (972) 567-6530
E-mail:
vkreaps@alternativegasprocessing.com

Tucker Gas Processing Equipment, Inc.
Ed Tucker
116 S. Capitol Ave.
Mt. Sterling, IL 62353
Bus: (217) 773-3338 ,(217) 773-3622
Mobile: (217) 473-3655
E-mail: tucker@adams.net

Energy Partners LP

Wellhead Energy Systems, LLC

Sustainable Profits in Today's Market

WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Constraints

WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Our Model

- Using Gas Assets for Baseline Profits
- Remote Location = Good Locations
- New Look at Prospecting
- Grid Distribution is dense

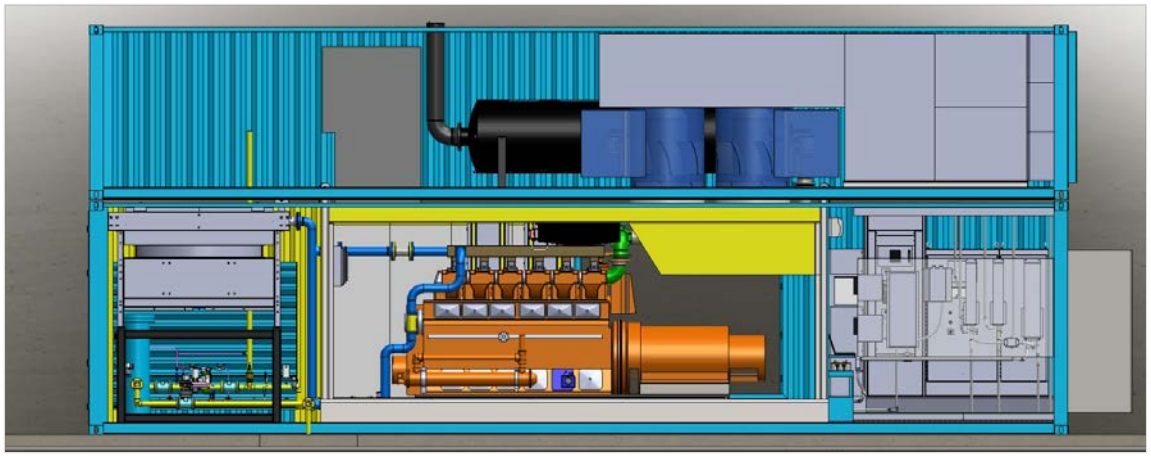
WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

There *are* Options

- **"Power to the Producer"**
- **Distributed Energy is not New**
- **Self Contained / 1060kw base unit**
  - ***800+ homes***



WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Gas Producer Benefits

- **Gas Producer Scenario** (Pipeline)
  - Published Price for gas $ 3.50
  - Cost of Prep and Pipeline Fees
    - Compression and Dehydration = $0.65 - $1.00
    - Broker Fees, Transport Fees, Line Loss =< $.50
  - Net Price to Producer = $2.00 per MCF
  - Pipeline requires pressures between 400-600 psi
- **Wellhead Energy Scenario** (Pipeline)
  - We can offer same or better net price as the Pipeline
  - Wellhead only requires 75 psi to power systems
- **Stranded Gas**
  - All Revenues go to Producer / Land Owner.

The numbers shown here are estimates and are for planning purposes only.

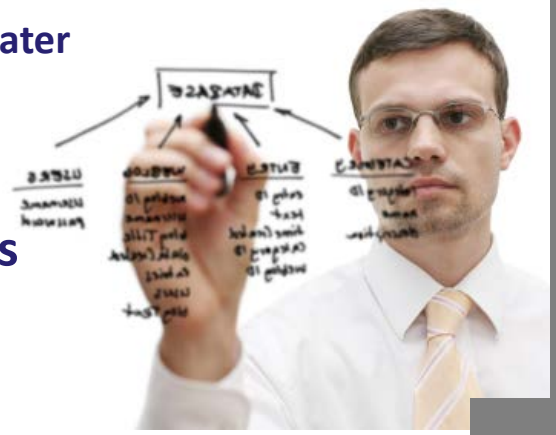
WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Deal Specifics

- Baseline Requirements 200 MCF per day
- 5 year Contract Minimum
- Price per MCF = To Be Determined
  - Based on price per kwh negotiated
- Contaminants “stripped out” in System
  - Sulphur, nitrogen, excess water
- No High Compression
- No Transport / Broker Fees



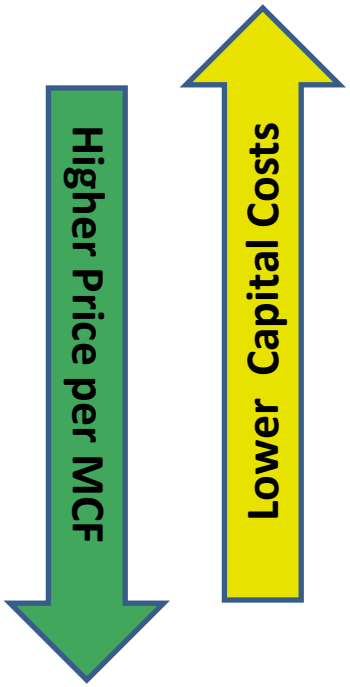
WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Options for Acquisition

- **Gas Purchase**
  - Long Term Fixed Price
    - **No Capital Investment**
    - **Provide land for System**
- **System Purchase**
  - Benefits
    - **Payback < 5 Years on Equipment**
    - **Options for Accelerated Depreciation**



WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Producer Advantages

- Baseline Profits for…
  - Remote
  - Stranded
  - Sub-Standard Gas Assets
- Get Gas Online prior to Pipeline Access
- Less Capital Outlay vs. Pipeline
- No Fees on Transport

WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Summary

- "Options for your Gas"
- New Paradigm
  - Baseline Profits instead of Speculation
- New Opportunities for Exploration
- Develop Profit Prior to Expansion

WELLHEAD ENERGY SYSTEMS

GridFox SMART ENERGY CONVERSION

enerfab EXCELLENCE THROUGH EXECUTION

Thank You !!

WELLHEAD ENERGY SYSTEMS

Grid Fox SMART ENERGY CONVERSION

Society of Petroleum Engineers

enerfab EXCELLENCE THROUGH EXECUTION

Contact Info

Wellhead Energy Systems, LLC

203 N Main St.

Somerset, KY 42501

www.wellheadenergy.com

Don Moss, VP Business Development

606-271-0119

don.moss@wellheadenergy.com