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BAUDETTE MINNESOTA NATURAL GAS LINE FEASIBILITY STUDY

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Table of Contents

Executive Summary	
Background	3
Scope & Methodology	
Project Description	Λ
Current Macro Economic Operating Situation	······································
Project Benefits	
Environmental, Planning and Construction Considerations	
Biogas Distribution & Incorporation	8
Geographic & Demographic Information	
Demographic Information	
Geographic Information	
Preliminary Financial Models	15
Micro Economic & Financial Impacts	20
Lowering Business Costs & Increasing Competitiveness	20
Savings to Customers	
Proposed Project Team	
Project Management Organization	
Engineering	
Construction Authority	



Executive Summary

The purpose of this feasibility study is to evaluate the opportunities and advantages of the local use of natural gas (NG) or Liquefied Natural Gas (LNG) in Lake of the Woods County through utilization of biomass generation or importation from a nearby supply. This document is to aid the city council in making an informed decision to move forward with the design and construction phase.

A prior study found that biomass was not a feasible option, thus the following alternative analysis was performed on the business case scenarios to install infrastructure required for the distribution of NG to the northern Baudette communities.

The conclusion of the study found that private funding, bonds, grants and or low rate loans are required to make the business case feasible. There is also a perceived risk upon possible shrinking margins of the current natural gas market where the producers are allowed to raise prices faster than economically feasible to be passed on to the end consumer. However, recognizing these risks and finding ways to resolve them makes the project feasible.

Background

Lakewood Energy is seeking opportunities to further economic viability with investment into energy distribution options such as biomass production for end products and electricity. A study performed by an independent consultant found that the natural resource quantities, local and remote demand on resources, market saturation and prices found most avenues with low return on investment and or high risk.

The U.S. increase in production of Liquefied Natural Gas (LNG) has driven the market prices down while local governments and energy distributors have maintained or increased prices. This delta in wholesale versa resale has increased margins and viability for energy companies to further invest in infrastructure and distribution to the end users.

Further investment into the distribution of Natural Gas (NG) from a biomass production facility, importation from an LNG localized filling station and or importation from the national supply provides many economic benefits to the community of Baudette. Among increasing Lakewood Energy's margins, the distribution network would provide future opportunistic avenues for producing energy, supporting industrial facilities, and increase in tourist establishments.

Scope & Methodology

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The scope of the feasibility study includes:

- Desktop study using Lake of the Woods County Sections 1 5
- Cost estimates +/- 20% for distribution systems
- Preliminary routing length of 67,000 ft
- High level Financial Analysis Modeling

The following methodology should be adopted, and established prior to execution:

- High level distribution & transmission engineering design for LNG importation
 - Desktop study for the various supply options available
 - o Storage and importation design
 - Transmission and distribution design
 - Preliminary routing and environmental considerations for transmission pipelines
 - Survey of each of the towns to establish estimates of gas loads



- Vantage point survey and environmental / constructability evaluation of each transmission pipeline route
- Conceptual cost estimate with cost of labor, materials, and associated fees.
- Conceptual Schedule
- A Strategic Outline Business Case (SOBC)/cost benefit analysis conducted for each pipeline corridor in accordance with the Northern Ireland Practical Guide to the Green Book³ where appropriate
 - Recommendation of the optimum gas supply
 - Consultation process with all interested parties including large potential customers
 - Capital and operational cost estimates derived for both transmission and distribution systems within each of the selected corridors
 - Distribution tariff derived for each of selected corridors
 - Average transmission tariff evaluated for each corridor
 - Sensitivity analysis to test changes in important assumptions
- Approve selection
- Complete design and specification documents for construction bid

Project Description

Current Macro Economic Operating Situation

The Natural Gas Distribution industry has had a reduced revenue stream during the past five years primarily due to the recession broadly reducing consumption of energy, including natural gas. Industry firms discounted prices to meet the sluggish demand, while households and businesses reduced utility use and spending. The recent discoveries of natural gas across the U.S. through approved extraction processes have increased the supply reducing natural gas prices. State utility regulators have prevented many distributors from increasing customer pricing because the cost of delivering natural gas has declined over the past five years

During the recession industrial production continued while increased demand for industrial products from emerging economies. As a result, industrial producers maintained energy demand during the recession in order to continue production. As the economy gains steam, new markets find ways to exploit the low price energy resources, demand for energy will rise and the market price for LNG and NG will increase. Due to the current market condition the risk for reduced margins on LNG and NG distribution is perceived as low as the market price rises this will intuitively be passed on to the end user.

Household and commercial customers use natural gas for primarily cooking and heating applications. Therefore, increased residential and commercial construction activity with connections to local natural-gas pipelines boosts demand for natural gas. Furthermore, carbon dioxide (CO2) regulation is expected to heighten in the United States, which will push for cleaner electricity generation and commercial consumption away from coal and propane, and toward natural gas as it uses half the CO2. Industry revenue is anticipated to increase at an average rate of 6.1% annually because of these positive trends.

Application Process Description

The Minnesota Public Utilities Commission shall accept, conditionally accept, or reject an application at its first regularly scheduled meeting after the application is filed with the commission, provided the application is filed at least 21 days before that meeting. The commission may conditionally accept or reject an application, but in both instances the commission shall inform the applicant which deficiencies, if



corrected, will allow the application to be accepted. If an applicant has corrected the deficiencies or provided the commission with the deficient information 14 days in advance of a regularly scheduled commission meeting, the commission must reconsider acceptance of the application at that meeting. If the commission fails to act at the first scheduled meeting after the application is filed, the application is considered accepted. On acceptance or conditional acceptance of the application, the commission and the applicant shall initiate the actions required by the Public Utilities Commission, Chapter 7852, Route Permit: Pipeline and/or as applicable.

The applicant shall provide copies of the application accepted by the commission to other state agencies who are not commission members, but have regulatory responsibilities for the proposed pipeline. The applicant shall send a copy of the accepted application to the Minnesota Historical Society, to the office of each regional development commission of a development region, soil and water conservation district, watershed district, watershed management district, county auditor, and to the clerk of each township and city, crossed by the proposed pipeline. Each county auditor, city clerk, or township clerk shall retain and file the application in a manner making it accessible to the public. The applicant shall also provide one copy of the application to any person upon written request made on or before the tenth day after the first day of the public hearing held in accordance with part **7852.1700**. The applicant shall maintain a list of the persons to whom copies are sent.

Chapter 7852, Route Permit: Pipeline part reference and tile section are listed below;

7852.0100 DEFINITIONS.

7852.0200 AUTHORITY, SCOPE, PURPOSE, AND OBJECTIVES.

7852.0300 APPLICABILITY OF RULES.

EMERGENCY PROCEDURES

7852.0400 PIPELINE EMERGENCY ACTION AND PROCEDURES.

CONDITIONAL EXCLUSION PROCEDURES

7852.0500 CONDITIONAL EXCLUSION PROCEDURES AND DETERMINATION.

EXEMPTION FROM ROUTE SELECTION PROCEDURES

7852.0600 PARTIAL EXEMPTION FROM PIPELINE ROUTE SELECTION PROCEDURES.

7852.0700 CRITERIA FOR PARTIAL EXEMPTION FROM PIPELINE ROUTE SELECTION PROCEDURES.

PIPELINE ROUTE SELECTION PROCEDURES

7852.0800 APPLICATION PROCEDURES AND REQUIREMENTS.

7852.0900 APPLICATION ACCEPTANCE NOTICE.

7852.1000 CITIZEN ADVISORY COMMITTEES AUTHORIZED.

7852.1100 CITIZEN ADVISORY COMMITTEE MEMBERSHIP.

7852.1200 PUBLIC ADVISER.

7852.1300 PUBLIC INFORMATION MEETINGS.

7852.1400 ROUTE PROPOSAL ACCEPTANCE.

7852.1500 ALTERNATIVE ROUTE ANALYSIS.

7852.1600 PUBLISHED NOTICE OF ROUTES ACCEPTED.

7852.1700 PUBLIC HEARINGS.

7852.1800 ROUTE SELECTION AND COMMISSION DECISION.



7852.1900 CRITERIA FOR PIPELINE ROUTE SELECTION.

APPLICATION PROCEDURES

7852.2000 PROCEDURAL REQUIREMENTS.

APPLICATION CONTENTS

7852.2100 GENERAL INFORMATION.

7852.2200 PROPOSED PIPELINE AND ASSOCIATED FACILITIES DESCRIPTION.

7852.2300 LAND REQUIREMENTS.

7852.2400 PROJECT EXPANSION.

7852.2500 RIGHT-OF-WAY PREPARATION PROCEDURES AND CONSTRUCTION ACTIVITY SEQUENCE.

7852.2600 PREFERRED ROUTE LOCATION; ENVIRONMENT DESCRIPTION.

7852.2700 ENVIRONMENTAL IMPACT OF PREFERRED ROUTE.

7852.2800 RIGHT-OF-WAY PROTECTION AND RESTORATION MEASURES.

7852.2900 OPERATION AND MAINTENANCE.

7852.3000 LIST OF GOVERNMENT AGENCIES AND PERMITS.

7852.3100 EVIDENCE OF CONSIDERATION OF ALTERNATIVE ROUTES.

PIPELINE ROUTING PERMIT

7852.3200 PERMIT ISSUANCE, DISTRIBUTION, AND EMINENT DOMAIN.

7852.3300 DELAY IN ROUTE CONSTRUCTION.

7852.3400 PERMIT AMENDMENTS.

7852.3500 RIGHT-OF-WAY PLAN AND PROFILE CONSTRUCTION SPECIFICATIONS REVIEW.

7852.3600 PERMIT CONDITIONS FOR RIGHT-OF-WAY PREPARATION, CONSTRUCTION, CLEANUP, AND RESTORATION.

7852.3700 REPORTING COMPLAINTS.

7852.3800 PERMIT MODIFICATION OR SUSPENSION.

7852.3900 PIPELINE CONSTRUCTION COMPLETION CERTIFICATION.

OTHER REQUIREMENTS

7852.4000 APPLICATION FEES.

7852.4100 GENERAL RESPONSIBILITIES.



Project Benefits

The following benefits can be perceived from the installation of a NG distribution network.

- Lower energy bills for residential and commercial end user (electricity and PP vs NG)
- Short term economic boost utilizing local labor
- Short term economic benefit from local suppliers to provide new appliances and installation
- Long term economic benefits providing jobs to manage infrastructure and business unit
- Increases viability to support industrial and energy production markets
- Diversified market for Lakewood Energy, LLC
- Provides opportunity to install other underground utility infrastructure for future purposes
- Provides future infrastructure for future expansion projects

Environmental, Planning and Construction Considerations

The initial step in our preliminary route selection was to conduct a desk top study using Lake of the Woods County Sections 1-5, highway 17N to Wigman. The maps provided in the Demographic and Geographic section of this study were used to establish various routing options. The evaluation considered proximity to the existing transmission network, proposed future developments and possible alternatives that may have been considered in previous studies. It should be noted that these options need further evaluation prior to selection. The criteria used to establish the optimum route corridor were:

- Ease of access from public infrastructure
- Shortest feasible transmission pipeline distance
- Nearest delivery or distribution station
- Location and suitability of the off take connection
- Capacity and supply pressure of existing network

Other key issues that will need to be considered are environmental, planning legislation, and ease of construction. This will involve gathering information on the following issues and should be established prior to execution:

- Statutory national and state designated sites
- Engineering considerations (suitability of road network for pipeline routing; Rivers, railways and other major pipelines to be crossed, difficult ground conditions, etc)
- Geology, hydrology, soils and land use
- Mineral extraction and known areas of landfill and contaminated land
- Landscape and topography
- Nature conservation
- Archaeology
- Proposed start and finish points
- The use of the existing road network if suitable
- Avoidance as far as practical of major environmental, amenity and engineering features
- Avoidance of potentially difficult construction areas (e.g. steep sided slopes, complex river crossings, poor ground conditions, etc)
- The shortest distance between the start and finish points

The choice of a suitable distribution main will be established following an engineering study to obtain and conduct roadside surveys from public vantage points. The route will then be determined to avoid developed areas, given clearance to individual properties, and avoid natural features and protected areas as much as possible.



Biogas Distribution & Incorporation

An Economic Stimulus Evaluation for Baudette Minnesota Utilizing Woody Biomass was prepared by Wenck Engineering in August 2012. The overall study found that there were no financially or ecologically sustainable biomass business case scenarios for the production of SNG, Methane, Cellulose Ethanol, supply to other facilities, and power.



Geographic & Demographic Information

Demographic Information

Map Section 1		Map Section 2	
Residential	30	Residential	80
Mobile Home Park	1	Mobile Home Park	0
	40 Units		
Commercial (Resorts)	0	Commercial (Resorts)	2
			20 Units
Commercial	2	Commercial	20 01113
(Businesses/School/Hotel)		(Businesses/School/Hotel	
Campground	0	Campground	0
Church	1	Church	1
	1.00	(Includes Bible School)	
Possible Additions	30	Possible Additions	200
Map Section 3		Map Section 4	
Residential	70	Residential	100
Mobile Home Park	0	Mobile Home Park	1
		8	5 Units
Commercial (Resorts)	2	Commercial (Resorts)	3
	20 Units	. ,	35 Units
Commercial	1	Commercial	2
(Businesses/School/Hotel)		(Businesses/School/Hotel)	-
Campground	0	Campground	1
			110 Units
Church	0	Church	0
Possible Additions	130	Possible Additions	40
Map Section 5		Totals	
Residential	100	Residential	380
Mobile Home Park	0	Mobile Home Park (2)	45
(Included with Resorts)		Commercial (13 Resorts)	275
Commercial (Resorts)	6	Commercial	14
(Includes Sportsman's Hotel	200 Units	(Businesses/School/Hotel)	15
Commercial	7	Campground	110
(Businesses/School/Hotel)	15 Units	Church	2
Campground	0	Possible Additions	435
Church	0		
Possible Additions	35	Total Units	1276
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Geographic Information







Preliminary Financial Models

The study follows closely the principles, guidelines and requirements for financial feasibility study, and comprises an assessment of needs, objectives, options, costs, benefits, and other non-quantifiable factors relevant to the project. The three models below take into consideration the loading capacity, or subscription of all potential customers at 100%, 90% and 80%. All models are presented evaluating the defined constraints, over a 20 year time horizon.

MODERN

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-		Option 1			Option 2			Option 3			Ontion A			-		
Year	PV Factor	Net Cash Flow	PV of Cash Flow	Cum. Cash Flow	Net Cash Flow	PV of Cash Flow	Cum. Cash Flow	Net Cash Flow	PV of Cash Flow	Cum. Cash	Net Cash	PV of Cash	Cum. Cash	Net Cash	Option 5 PV of Cash	Cum. Casi
0	100%	-4 750 000	-4,750,000	-4,750,000	-5 250,000	-5.250.000	-5,250,060	4 275 000	4275 000	-1 275 000	-2750.000	1750 000	Flow	Flow	Flow	Flow
1	91%	463,500	421,364	-4 328 636	463,500	421.354	-4 828 635	463 500	421 364	1862.535	150.500	*2.130.000	-2,750,000	-1,750,600	-1,750,000	-1,750,000
2	83%	463 500	383,058	-3.945.579	463 500	383.055	445 570	153 600	-21,004	-0.000.000	353,500	321,364	-2,428,636	295 500	269.545	-1,480,455
3	75%	463,500	348 234	-3 597 344	463 500	348 334	4.007.744	005,500	383,855	-3,4/0,579	353,560	292.149	-2,135 488	295,500	245.041	-1,235 413
4	68%	463 500	316 577	3 780 767	400.000	340,234	-4.091 344	483.500	348.234	-3,122,344	353 500	265 590	-1 870 898	296.500	222 765	-1 012 641
4	62%	153 503	247 747	-3.200,/8/	403,300	316 577	-3,780,767	463 500	316.577	-2,605,767	353,500	241,445	-1 629 453	295 650	202 512	840 495
-	5211	403 300	201,191	-2,992,970	463,560	287 797	-3,492.970	463,500	287,797	-2.517,970	353.500	219 495	-1 409 957	204 600	484 460	-010,135
•	30%	463.500	261,634	-2.731,337	463 500	261 634	-3.231 337	463.500	261,634	-2.256 337	353 500	100 647	1 7400,001	285,344	184,103	-626.032
T _c	51%	483 500	237,849	-2,493,488	463 500	237 849	-2.993.488	463.500	237 849	.2 018 488	153 500	100,042	+1,219,410	296 500	157,367	-458,665
8	47%	463,500	216,226	-2 277 262	463 500	216 226	-2 777 262	453 500	216 225	1.000.000	553,500	101,401	-1,029,014	296,500	152,151	-305,514
9	42%	453 500	195 569	-2.080 692	483 500	196 550	-1 680 501	400 000	210,220	-1,602,292	353.500	164,910	-864,104	295,500	138,319	-168,194
10	39%	463.500	178.699	-1901957	463 600	178 500	A 404 000	403.300	130 203	-1.605.692	353,500	149,919	-714,185	295,500	125,745	-42.449
15	35%	463 500	152 454	1 728 510	400,000	110,044	-2,401 393	463 500	178,699	-1,426 993	353,500	135,290	-577.895	298.500	114.314	71 85.4
12	12%	153 600	102 434	*1,133,333	403,000	162,454	-2.239,539	463,500	152.454	-1 264,539	353,500	123,900	453 996	296 500	103.01+	175 700
12	2010	403,000	141,003	-1.591,854	463 500	147.685	-2,091,854	453 500	147,685	-1.116,854	353,500	112 636	341 960	305 600	04.474	113,100
1.3	2378	463368	134,259	-1,457,594	463,500	134 259	-1.957.594	463,500	134 259	-982 594	353 560	102 105	218.004	290,300	94,474	270,260
4	20%	453,500	122,054	-1.335.540	463,500	122.054	-1,835.540	463.500	122.054	-850 540	151 600	09.020	-630 304	296,560	85,885	356,145
15	24%	463,500	110,958	-1 224 582	463.500	119 958	-1.724 592	453 500	110 052	740 520	000,000	32,059	-145,875	295 500	75,078	434,223
6	22%	463 500	100,871	-1,123,711	463 500	100 871	1 623 711	461 600	400.075	-1+3 30%	393 900	64,625	-61,251	295 500	70.980	505,203
7	20%	463,500	91.701	-1.032 010	463 500	01.701	1.530.040	403,300	199,871	-648,711	353,500	76,932	15,681	296,500	64.527	669,730
8	18%	463 500	83 365	-048 646	453 500	31,191	-1,332,010	463,500	91,701	-557.010	353,500	69,938	85.619	256,500	58,661	628.391
9	1616	451 500	75 705	179 609	40.500	03.365	-1,448 545	463,500	83.365	-473,645	353 560	63,580	145 199	295,500	51 128	841 710
6	1.04		13,768	-072.850	483,500	75.786	1.372,860	463.500	75,786	-397,950	353.500	57.800	206 996	206 500	12 480	2001112
-	1014	9	0	-872.860	0	0.	1 372 855	0	0	-397.850	0	0	208 802	000,000	058,00	7 30,199

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Baudette Minnesota Natural Gas Line Feasibility Study MPS Letter No: 120525-0109 rev. 00 December 13, 2012

245,000

245,000

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40,059

0 299.405

259 344

299 405

Micro Economic & Financial Impacts

In an environment of traditionally high energy costs in northern Minnesota there is an ever increasing focus of policy on energy efficiency and emissions reduction. Holistically, the Utility Regulator believes that the attractiveness of natural gas is likely to increase as fuel prices become more related to the level of carbon emissions. It also acknowledges the economic reasons for promoting gas, such as increased fuel choice and savings for consumers and the diversification of energy sources, which would generate competition. This should put downward pressure on the price of all energy supplies, an important aim not only for the Regulator, but Lake of the Woods County as well, where the cost of energy remains a major concern.

The evaluation models distribution tariff/and or bond for each model which allows the licensee to recover all of the costs associated with the project as it connects to the network. The 'breakeven' tariffs calculated for each option range between \$.15 to.38 per therm. Based on an analysis of a 'viable' gas tariff and/or bond, the 'breakeven' gas distribution tariffs were found to generate natural gas prices which are approximately 20% less when compared to gas and oil. Moreover, based on the pattern of future prices published, the differentials between the cost of natural gas and gas oil and fuel oil prices looks set to steadily increase over the next four years, and with historical lows for propane, the margin will only increase.

Lowering Business Costs & Increasing Competitiveness

With energy prices in Northern Minnesota traditionally amongst some of the highest, the additional fuel choice with the introduction of gas could lead to more competitive energy pricing, thus helping to lower business overhead costs and increasing the competitiveness of Lake of The Woods County businesses. Other economic benefits from rolling out the gas network comprise the opportunities it generates for embracing new skills and new technologies as businesses switch to gas and as new businesses are

established. There is also the potential to increase renewable energy by providing a network which could cater to other sources in the future.

Savings to Customers

The benefits of switching to gas include the customer savings, already quantified above. The likelihood is that these increased savings make their way back to the local economy. Depending on what customers chose to do with those savings, they should result in increased economic activity across The Lake of the Woods County.

Proceeding with this project may or may not require a subvention. This is a matter for the investment group and Lakewood Energy to determine while taking into consideration whether distribution Levy's are increased for all customers across the county or whether the increase in the tariff as a result of the investment is not passed on to gas customers. In the event that tariffs are not increased, the level of subvention required is determined from the discounted commercial net cash flows and excludes any external benefits which do not accrue to the license holder. Thus taking account of the commercial costs and benefits/ revenues generated by each corridor, the transmission projects would need to be supported by a public subvention if these corridors were to proceed. The required level of subvention is to be sufficient to enable the cash flows including the subsidy to satisfy commercial investment criteria. The transmission element of the project uses 10% as the rate that reflects commercial returns in current licensing agreements.

Consequently any potential licensee who can achieve the volumes as captured in the models and keep the costs in line with those estimated in the models will earn 10% as the rate of return that reflects commercial returns, assuming a subsidy is provided. Higher volumes and/or lower costs would result in a lower subvention, assuming a 10% rate of return.

Proposed Project Team

A preliminary review was performed by MPS on the project roles and responsibilities required to execute the phase of the project through completion. It is recommended that an Engineering, Procurement and Construction (EPC) company be utilized.

Project Management Organization

The proposed project management organization (PMO) would provide a fulltime Project Manager to serve e as the single point of contact for the city of Baudette. The Project Manager will be responsible for weekly status meetings with all team members and the Baudette representative responsible for the project. The project Manager will provide weekly updated schedule, action item list, weekly report summary, procurement log, and lessons learned. The following organizations will report directly through the PMO. The Project Manager for this project will be supported by an administrative assistant.

Engineering

The following engineering disciplines with approved P.E. stamps for Minnesota will be required for design and oversight during installation of this project.

- Environmental
- Civil
- Mechanical
- Electrical

Construction Authority

A construction management firm that utilizes local general contractors should be used to provide the following installation services and help promote local economic development.

- Earth moving, trenching / grading
- Mechanical PF / PFW
- Electrical
- Fencing Installation
- Helper
- Security