



## Natural Gas-Based Economic Development for the Sussex, NB Region

Prepared for:

Enterprise Fundy

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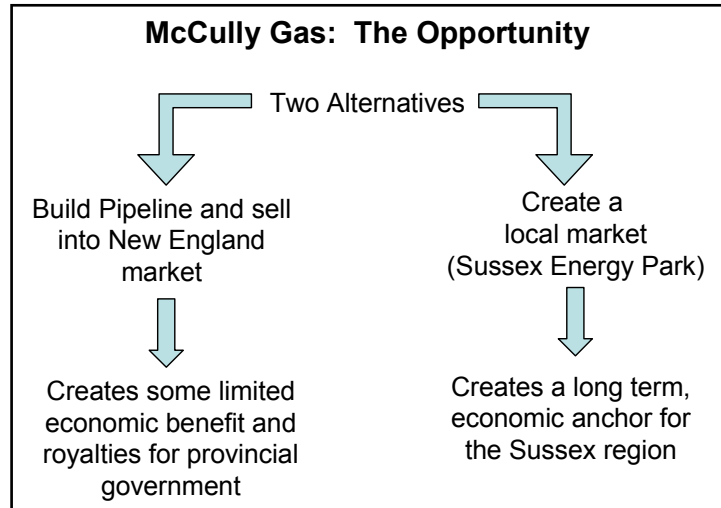
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## Executive Summary

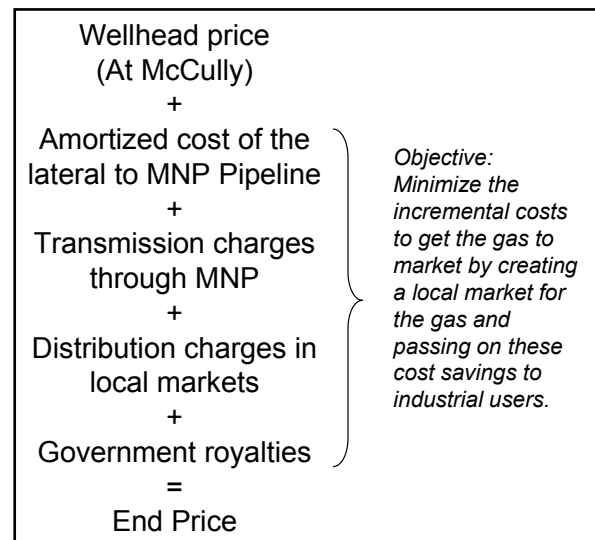
The attraction of business investment into a community must be tied to a unique value proposition. Business investment flows to communities that offer a distinct advantage over competing jurisdictions. In New Brunswick, most of the communities around the province saw their economies grow as the result of specific economic opportunities – centred mainly around natural resources such as the forestry, fishing and mining sectors. When the value proposition offered by these communities erodes, over time many of the companies exit the local communities leaving high unemployment, declining populations and increasing pressure on the social infrastructure. Three recent examples highlight this reality. Saputo announced in August that it is closing its New Brunswick margarine plant in Sussex. The U.S. owners of the St. Anne-Nackawic pulp mill recently announced they would be shutting down the mill in Nackawic and UPM- Kymmene will be closing its pulp mill in the Miramichi.



In order to ensure a growing and vibrant economy across the various regions of New Brunswick, it is vitally important for communities to carve out a unique niche and focus significant effort to attract and grow industry. There are a number of examples of this type of effort in New Brunswick such as the development of an environmental industrial park in Belledune and growth of the call centre sector in a number New Brunswick communities. Slemon Park, on PEI, is another excellent example of a small community leveraging unique local advantages (in this case the military base infrastructure and a base closure fund) to grow a small cluster of aerospace firms.

The discovery of natural gas in the Sussex region has the potential to be a significant economic driver for that region of New Brunswick by providing a unique value not offered by other communities in Atlantic Canada and indeed in much of eastern Canada and the Northeastern United States – namely, a local supply of low cost natural gas.

**The economic benefit that the Sussex region will glean from this unique value proposition will be tied directly to the amount of effort government and industry expends to exploit the potential opportunities.** At the low end, the region and the province will benefit from the jobs associated with the exploration, production and distribution of the natural gas as well as the royalties generated from its sale. However, as this research will reveal, there is potential to leverage the local supply of natural gas into addition economic opportunities by creating the conditions under which companies that require a large supply of natural gas would be attracted to the region.



This research will show that eliminating or reducing the incremental costs associated with the transportation and distribution of McCully gas to market could significantly reduce the end cost of gas to the industrial user and provide a significant incentive to locate in the “Sussex Energy Park”.

## Key Research Findings:

### The McCully Natural Gas Field

- The McCully Natural Gas Field is estimated to have one trillion cubic feet (Tcf) of gas. - A recent analysis found between 120 Bcf (proved and probable) and 164 Bcf (proved, probable and possible) of recoverable gas in *one segment* of the McCully Field. This would be more than enough gas to supply a cluster of firms for the foreseeable future. In comparison, the initial development offshore Sable Island has an estimated 1.3 Tcf.
- Corridor Resources is in discussions with potential partners for the further development of McCully gas. - Including the development of 26 additional wells and a 45-km lateral to connect with the Maritimes and Northeast Pipeline.
- There will be \$42 million in construction activity over a three year period. - During the construction phase of the McCully build out. This will create an estimated 188 full time equivalent jobs per year and \$4.9 million in new household income. This is primarily a limited, short term economic benefit. In addition, much of the economic activity will likely take place in adjacent communities such as Saint John and Moncton.
- Corridor's objective is to: - Maximize its revenue potential and ensure a steady market for their natural gas.

### Importance of Low Cost Natural Gas to Site Selection

- Low cost<sup>1</sup> natural gas is a significant site selection factor - It has become more important in recent years due to supply pressures and price volatility across North America. However, the research confirms that other site selection factors such as government incentives (consistently ranked #1), labour costs, low tax rates, etc. are very important.
- Low cost natural gas is more important to a few specific industries. - Large scale users such as an aluminum plant require much more energy and therefore place a higher value on a low cost supply of natural gas. Also, certain activities within the agri-food, chemical, plastics and metal component manufacturing industries are significant users of natural gas and would be more inclined to locate in a community with a low cost supply.
- Low cost natural gas, by itself, does not offer enough value to attract industries. - But it can be a very important part of an overall value proposition. As an example, the telecommunications infrastructure in New Brunswick was a key part of the call centre value proposition but it did not stand alone. The province also offered an available, bilingual workforce, ample vacant office space, very competitive government incentives and a highly aggressive marketing and sales campaign. These factors, coupled with the impetus of a few early wins, led to the growth of this sector in New Brunswick. The same methodology needs to be applied to Sussex natural gas. If industrial natural gas prices can be structured to be the lowest in eastern Canada and the Northeastern US, this benefit can be the anchor of a value proposition. However, other elements will need to be crafted.

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<sup>1</sup> We define 'low cost' as among the lowest cost locations in North America. If a local supply of natural gas was offered at an even deeper discount, the value to the community would be higher. However, there is no province/state in North America (with the exception of Alaska) that offers natural gas at a 'deep' discount.

## Natural Gas Pricing

The cost of natural gas is made up of three components:

The price of natural gas for industrial users varies widely across North America.

If McCully gas did not bear the MNP transmission charge and was burdened by only a limited local distribution charge:

In general, areas that have local production of natural gas have lower industrial gas rates.

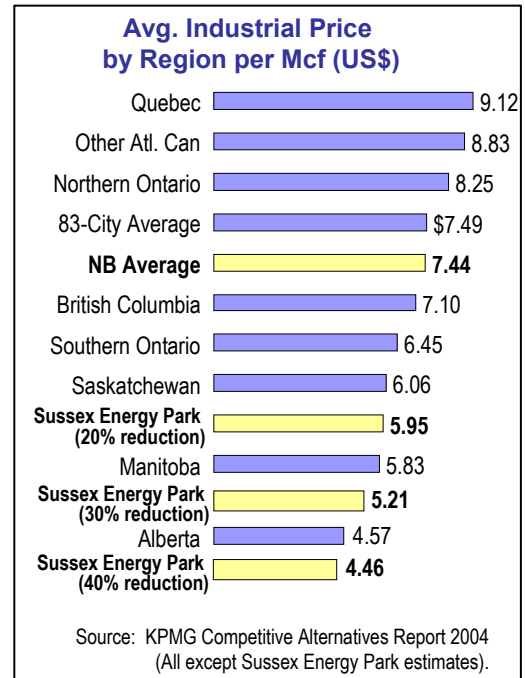
Some jurisdictions offer an 'incentive rate' for industrial use of natural gas.

Government royalties can be a significant component of the end price. *The New Brunswick royalty system is not structured to encourage new exploration and production.*

- the commodity (wellhead) cost, the transportation/transmission cost and the local distribution cost. For industrial users, the cost of transportation and local distribution of natural gas can be as high as 30% of the total end price. The commodity price of gas is unregulated.

- A recent KPMG study found that average prices ranged from \$4.57/Mcf in Alberta to \$10.56/Mcf in Connecticut (US\$). New Brunswick's average industrial price in this study was \$7.44/Mcf – lower than the North American average.

- In theory, the cost to local users could be as much as 30% below current market rates while providing the supplier with a revenue maximizing price. With a 30% lower rate, prices would be lower than most North American locations.



- The larger the supply, the greater the price differential. For example, Alberta's natural gas rates for industry are the lowest in North America.

- This typically can represent around 10% of the cost. However, the regions that offer low cost natural gas still have a significant price advantage compared to regions with higher natural gas costs and an incentive rate.

- In New Brunswick, the royalty rate is 10% of the price less 'proportionate share of production, processing and transportation charges'. Sable Island gas is currently benefiting from an initial 2% royalty rate. After the producer achieves an initial return on their investment, the royalty rate increases incrementally until a top rate of 35% of the end price of the gas. Sable Island gas falls under the jurisdiction of the Federal government and that has led to disagreement regarding the sharing of royalties between the Federal and provincial governments. New Brunswick gas falls under provincial jurisdiction and is only subject to provincial royalties.

## Natural Gas Pricing (continued)

Some central and western Canadian cities have used federal infrastructure funding to subsidize the building of natural gas infrastructure.

- This has a direct impact on the end price of natural gas – specifically in Manitoba and Saskatchewan.

## The Sussex Energy Park – A Concept

Anchor element to the value proposition.

- Low cost natural gas could be an excellent anchor to a new ‘Energy Park’ in the Sussex region.

New Brunswick, in general, is a relatively low cost location for industry.

- The Province offers competitive labour costs (wages and benefits), low construction/occupancy costs and relatively low energy costs. However, the overall tax burden for corporations as well as higher transportation costs erodes the province’s competitiveness.

**There are some challenges with the value proposition.**

- **Namely the low level of provincial government incentives, the high tax environment, etc. compared to other Canadian provinces and U.S. states.**

Another key challenge for the Sussex region is the marketing of the community.

- Recent ACOA research confirmed that Atlantic Canada is still one of the last regions that U.S. business leaders consider when evaluating potential sites for a new facility. Sussex, as a small community within Atlantic Canada, is challenged by this reality. However, as in the case of Slemon Park and elsewhere, if Sussex can use highly targeted methods to promote itself and offer a unique value proposition it should be able to attract investment.

## Regulatory Environment

Natural gas is regulated by the New Brunswick Public Utilities Board.

- The Natural Gas Distribution Act 1999 sets out the terms under which natural gas is managed and distributed in New Brunswick.

Enbridge Gas NB has the general franchise for the distribution of natural gas in New Brunswick.

- Enbridge and several other companies are local marketers of natural gas to end customers. Enbridge has no plans to bring natural gas to the Sussex area. However, they are potentially interested in partnering on the lateral to bring McCully gas to the main MNP pipeline.

There is a mechanism in the legislation allowing for ‘single use franchises’.

- There are several that have been awarded. The single use franchise allows a large client to negotiate a supply contract directly with the supplier of the natural gas – bypassing the distribution company.

The Natural Gas Distribution Act 1999 does make reference to ‘local gas producers’

- and does allow for the local distribution of this gas provided that the “customers of the gas distributor [Enbridge] would not be materially prejudiced by authorizing the *local* gas producer to serve part of the gas distributor’s general franchise”.

## Major Users of Natural Gas

- There are a number of industries that are significant users of natural gas and energy in general. A number of sub-sectors in the wood and agri-food sectors are major users.

## Locations with High Energy Costs

- The two main regions in the U.S. faced with high energy costs (including natural gas costs) are California and the eastern seaboard of the U.S from Maine down to Washington, D.C.

## Potential Anchor Projects for the Sussex Energy Park

- A large user could provide an anchor for the Sussex Energy Park. This anchor project would, in theory, utilize a significant amount of McCully natural gas and allow for the postponement of building the lateral to the MNP pipeline. There are several potential 'anchor' users of natural gas:
  1. **A natural gas-fired power generation facility.** - NB Power has limited interest in developing a natural gas-fired power generation facility in the Sussex area. They are concerned about the capacity of McCully to be able to supply their needs and with the current high price of natural gas. However, a more in depth feasibility study could allay fears related to both these issues. In addition, other energy companies such as Emera and Duke Energy should be considered as potential targets.
  2. **A co-generation plant.** - Co-generation plants produce both electricity and heat. The heat can be utilized in a manufacturing process and the electricity can also be used locally or added to the provincial power grid. Several natural gas marketers have shown an interest in partnering on these types of facilities.
  3. **A Gas-to-Liquids (GTL) plant.** - GTL is a process for converting natural gas into synthetic oil, which can then be further processed into fuels and other hydrocarbon-based products. These plants are an alternative for 'shut in' gas (no connection to the main transmission pipeline) and can be scaled for smaller gas deposits. As an example, Irving Oil is the largest distributor of jet fuel in eastern North America. A GTL plant can be used to produce jet fuel.
  4. **A major user.** - Potentially relevant local examples would be a cement plant, a rubber plant to service Michelin's three tire plants in Nova Scotia or a juice concentrating facility.
  5. **A local natural gas utility.** - This would be similar to the approach taken by the City of Medicine Hat where the municipality owns the rights to a significant portion of the natural gas reserves and sells natural gas directly to end users. However, the goal of the Sussex Energy Park is not to establish a 'local utility' that would service a broad group of business and residential users in the Sussex area. Rather it is to provide low cost natural gas to attract a select group of new businesses to the area to create jobs and economic opportunity. Given this mandate, a local utility most likely would not be an effective structure in a small, defined geographic area near gas.

## Comparative Locations

- Plattsburgh, NY** - Has used incentive energy rates as an important component in attracting over a dozen major, multinational firms to a small community in upstate New York.
- Medicine Hat, Alberta** - Has used its significant natural gas industry as the community's brand – "The Gas City" and leveraged very low natural gas costs into a number of major investments.
- Burlington, Vermont** - Has among the lowest cost natural gas in eastern North America. However, they do not overly promote this fact and are not aggressively pursuing manufacturing operations. They have not leveraged the low cost gas into further economic development.
- Guysborough, Nova Scotia** - Offers large users of natural gas a 'Bypass Rate' on Sable Gas. Companies in the Goldboro Industrial Park do not have to pay the MNP toll on natural gas. Despite this advantage, the community has not benefited from any major investments (beyond the gas processing facility). The lack of an overall value proposition and marketing effort may be inhibiting the community's ability to leverage this natural gas advantage.
- Baglan Bay Energy Park in Wales, UK** - Is a major industrial park centred around low cost natural gas and low cost electricity from a local natural gas-fired electricity plant. Leveraging major government and private sector investment, the Energy Park has attracted a number of large scale manufacturing projects.

## Recommendations:

- 1. Refine the overall value proposition.**
  - Enterprise Fundy should begin discussions with its partners, Business New Brunswick and ACOA to develop the broader value proposition required to make the Sussex Energy Park a viable tool for investment attraction to the province. The partners may wish to look at establishing an 'economic development zone' concept such as Empire Zones in New York, Slemon Park on PEI, etc. Not only do these zones provide tangible benefits to the companies, they also provide a good marketing hook to attract interest.
- 2. Determine potential industrial pricing structures.**
  - Enterprise Fundy should begin *confidential* discussions with Corridor Resources as to what potential pricing structures could be offered to local users of the natural gas.
- 3. Research a potential local gas distribution approach.**
  - Enterprise Fundy should explore the local distribution scenarios for the natural gas. Some infrastructure will be required to distribute and maintain the gas supply. Enbridge may be the logical partner for this but they currently charge a 'postage stamp' rate for their gas distribution to New Brunswick businesses. The cost of local distribution of McCully gas should be tied to the local cost. Enbridge has negotiated specific arrangements such as the one with the Flakeboard plant in St. Stephen. There is also the option of applying for a 'single use franchise' with the Public Utilities Board. The board has issued several of these franchises in New Brunswick.
- 4. Develop a marketing plan.**
  - Enterprise Fundy should begin to consider what marketing tactics will be used to promote the Sussex Energy Park. An aggressive marketing campaign has been a key element of all of the successful foreign investment attraction programs evaluated for this research. This marketing strategy should include highly targeted activities to attract a major, anchor user for the natural gas and a more generalized strategy to promote the park to a wider audience of potential users.
- 5. Define the physical location and structure of the proposed Energy Park.**
  - Enterprise Fundy should consider developing architectural renderings related to the proposed "Sussex Energy Park" as well as consider some basic site work, etc. It is difficult to get companies interested in a vague concept. Specific particulars related to the Energy Park should be fleshed out should the organization wish to pursue this opportunity.
- 6. Do a formal feasibility study on the potential of a gas-fired electricity generation station.**
  - Enterprise Fundy should undertake a formal feasibility study of the potential of a natural gas fired electricity generating facility located next to the McCully field.
- 7. Assess initial interest from a core group of potential partners.**
  - Enterprise Fundy should begin discussions with potential major private sector partners on this initiative.
- 8. Act quickly.**
  - There is an element of timing to this initiative. Corridor Resources is currently evaluating its options for transporting McCully natural gas to the main Maritimes and Northeast Pipeline. Any legitimate alternative uses for McCully gas should be put forward in a timely fashion to allow Corridor to include in their business model.

# 1. Introduction

ShiftCentral and Canmac Economics Ltd. were retained by Enterprise Fundy to explore the potential economic development opportunities associated with the discovery of natural gas in the McCully Field near Sussex. The central premise behind the research is that McCully gas is a natural resource advantage for the region in much the same way as other industries such as fishing, forestry and mining. In the case of those industries, they have been leveraged over the years into significant secondary economic development benefits for New Brunswick. This research looks at the set of conditions required to allow natural gas to bring similar secondary economic development benefits to New Brunswick and specifically, the Sussex region.

There is no question that the production of natural gas from the McCully Field will generate economic benefits for the province. Already, the Potash Corporation of Saskatchewan is using the local gas in its production activities. In addition, any commercial sales of the gas will generate royalties for the provincial government. However, the amount of direct economic benefit for the Sussex region will be limited without a deliberate strategy to leverage the resource into further economic development. Unlike the forestry, fishery and mining sectors which require a significant amount of economic activity to extract and transport their goods to market, the natural gas industry is not labour-intensive and does not require a significant amount of economic activity to extract and transport product to market<sup>2</sup>.

This report will explore a number of key issues related to the set of conditions required to allow the region to leverage the McCully gas into secondary economic development. Specifically, the research will determine:

- Is a 'low cost' local supply of natural gas an important incentive to certain industries? If so, what industries?
- What constitutes 'low cost' natural gas? Will the natural gas flowing from the McCully reserves be priced at levels lower than competitor jurisdictions?
- What are the regulatory conditions required?
- What other elements of the value proposition are required in addition to a low cost, local supply of natural gas?
- Are there potential 'anchor' projects that could use a significant amount the natural gas and provide the impetus for further development?

This report does not provide a specific action plan for Enterprise Fundy. Rather it provides the elements that would be required in order for the region to accrue incremental benefits from this local supply of natural gas.

From the Enterprise Fundy Request for Proposals, the specific objectives of the research are as follows:

- Review the regulatory and business environment surrounding the industrial access and use of natural gas in N.B.
- Review the regulatory and business environment in three 'success cases' in other North American jurisdictions.
- Recommend changes to the regulatory and business environment that would allow Sussex to fully leverage the potential of natural gas.

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<sup>2</sup> With the exception of the initial construction activity to build infrastructure such as processing and pipeline facilities. See section 2.1 below.

## Glossary of Terms:

- **BTU (British Thermal Unit):** Natural gas is commonly measured in millions of BTUs, or MMBTU.
- **Cubic Foot:** The most common unit of measurement of gas volume.
  - o Ccf (One hundred cubic feet);
  - o Mcf (One thousand cubic feet);
  - o MMcF (One million cubic feet);
  - o Bcf (One billion cubic feet);
  - o Tcf (One Trillion cubic feet).
- **Wellhead Price:** The cost of gas as it comes from the well excluding cleaning, compression, transportation, and distribution charges.

- Identify specific industries that would benefit from very competitively priced natural gas.
- Identify specific locations, particularly in the U.S., where industries are faced with high energy costs.
- Examine and document the economics and possible business case for a large-scale electric power generation facility located within very close proximity to a major source of natural gas.

ShiftCentral and Canmac conducted 15 interviews and completed an exhaustive review of various literature sources. See Appendix A for a list of organizations interviewed and sources consulted.

## 2. McCully Natural Gas: An Overview

The McCully Field, located just outside Sussex, New Brunswick, has been in production since April 23, 2003 serving a limited local market, namely the Potash Corporation of Saskatchewan (PCS) mill in the area. The natural gas was discovered by Corridor in September 2000. Eight gas bearing wells has been drilled on the structure to date with the first two wells producing since April 2003.

### 2.1 McCully Reservoir Characteristics

- 400m gross sand/shale thickness (refers to the depth of the reserves)
- 20 to 40 meters net pay (thickness of the productive portion of the reservoir)
- over-pressured gas column (a positive condition for the extraction of the gas)
- 1 Tcf + natural gas in place (estimated) (this compares to 1.3 Tcf of proven and probable reserves in the initial production area of Sable Island)
- up to 10% porosity and 2 md perm
- sands are 'water sensitive'
- sweet gas (1060 btu/cu.ft.) (low in hydrocarbons and sulfur)

### 2.2 Next Phase Development Plan

- 15 initial development wells planned north of the PCS mine based on 110 acre well spacing.
- Planned wells projected to be each capable of 2-3 mm/d production based on open hole completions, 4 - 6 mm/d with fracs.
- Projected reserves of 5 bcf bcf/well.
- Additional wells to be drilled as required to expand/maintain production rate.

In July 2004, Corridor Resources Inc. commissioned an independent reserves report for part of the McCully natural gas field. The Report assesses the quantity and value of Corridor's working interest share of the proved, probable and possible reserves in a portion of the McCully field encompassing the McCully A-67, P-66, K-57 and D-48 wells. The combined geological, reservoir engineering and economics report was conducted by APA Petroleum Engineering Ltd. (APA) and Petrel Robertson Consulting Ltd., both of Calgary, Alberta. The Report estimated that this portion of the McCully field contains between 120 bcf (proved and probable) and 164 bcf (proved, probable and possible) of gas. There is an estimated 1 trillion cubic feet (Tcf) of natural gas in the total McCully field.

In comparative terms, the estimate of the probable Tier 1 Sable Island reserves off Nova Scotia are only 1.3 Tcf and this number has been significantly downgraded from the original probable reserves of 3.6 Tcf. The total potential reserves in the greater Sable area is estimated to be as high as 22 Tcf but in 2003, the partners in the Exxon Mobil Sable project decided not to proceed with development of one of the Tier 2 fields following disappointing drilling results. Plans for developing a second major offshore gas field, Deep Panuke, were put on hold early last year as EnCana, its developer, decided to reassess the viability of the project in relation to the company's alternate investment opportunities. The cost to develop offshore gas is significantly higher than the gas reserves at McCully.

### 2.3 Potash Corporation of Saskatchewan – First McCully Gas Customer

Currently, McCully gas is sold to PCS, which uses the gas as fuel in the nearby potash mill. Wells McCully A-67 and P-66 supply the gas for this contract and are both tied in and have been producing since April 2003.

The mill requires approximately 2 MMscf/d of fuel gas, which can currently be supplied by the McCully #1 and #2 wells. These wells are owned 50% by Corridor and 50% by PCS and the McCully #5 well, which is owned 100% by Corridor, will not be tied-in until the currently producing wells are no longer able to supply sufficient gas to the mill.

According to Corridor Resources, the PCS mine has over 100 years of potash reserves. McCully gas will be servicing this facility for many years to come.

**Table 1: McCully Field – Gas Initially in Place (Bscf, raw)**

Sector	Confidence Level		
	90%	Mean Value	10%
<b>A-67 Block</b>	97	110	125
<b>Graben Area</b>	58	66	74
<b>Northern Region</b>	58	68	79
<b>Total Field*</b>	<b>217</b>	<b>245</b>	<b>275</b>

\* Probabilistic Summation

Table 2 provides estimates of ultimate recovery gas.

**Table 2: McCully Field – Evaluation of Corridor working interest reserves as at July 1, 2004**

<b>Forecast ultimate recovery (Bscf, raw gas), Total Field/Corridor W.I.</b>	
Proved (1P)	18 / 9
Developed	12 / 6
Undeveloped	6 / 3
Proved + Probable (2P)	120 / 80
Proved + Probable + Possible (3P)	164 / 110
<b>Cumulative Production to date (Bscf, raw gas), Total Field / Corridor W. I.</b>	
	0.8 / 0.4
<b>Estimated W.I. Reserves (Bscf, sales gas), Total Field / Corridor W.I</b>	
Proved	17.2 / 8.6
Proved + Probable	116.5 / 77.9
Proved + Probable + Possible	15936 / 106.7

*Rounding errors may occur*

## 2.4 The Lateral to the MNP Pipeline

Corridor Resources is currently exploring options for transporting McCully gas through a lateral pipeline to the main Maritimes and Northeast Pipeline that runs 45 km to the north of the McCully field. The cost of this lateral will be significant – mostly likely in the range of \$30 million. This cost, in addition to all other transportation and distribution charges, will have to be amortized over the reasonable period and therefore will be reflected in the end price the consumer pays for the gas.

**The central tenet of this report is that if enough demand for the natural gas were to be stimulated in the local area around the McCully field, then most of the transportation and distribution charges (including the cost of the lateral) could be allayed leading to a lower cost natural gas while at the same time allowing Corridor Resources to be able to achieve a market rate for its gas.**

Ultimately, Corridor's objective is to sell its gas at a fair market price. If the Sussex Energy Park can identify and secure a major anchor user (see section 9 below) and ensure that McCully gas will have a local market, additional costs such as the lateral may be deferred.

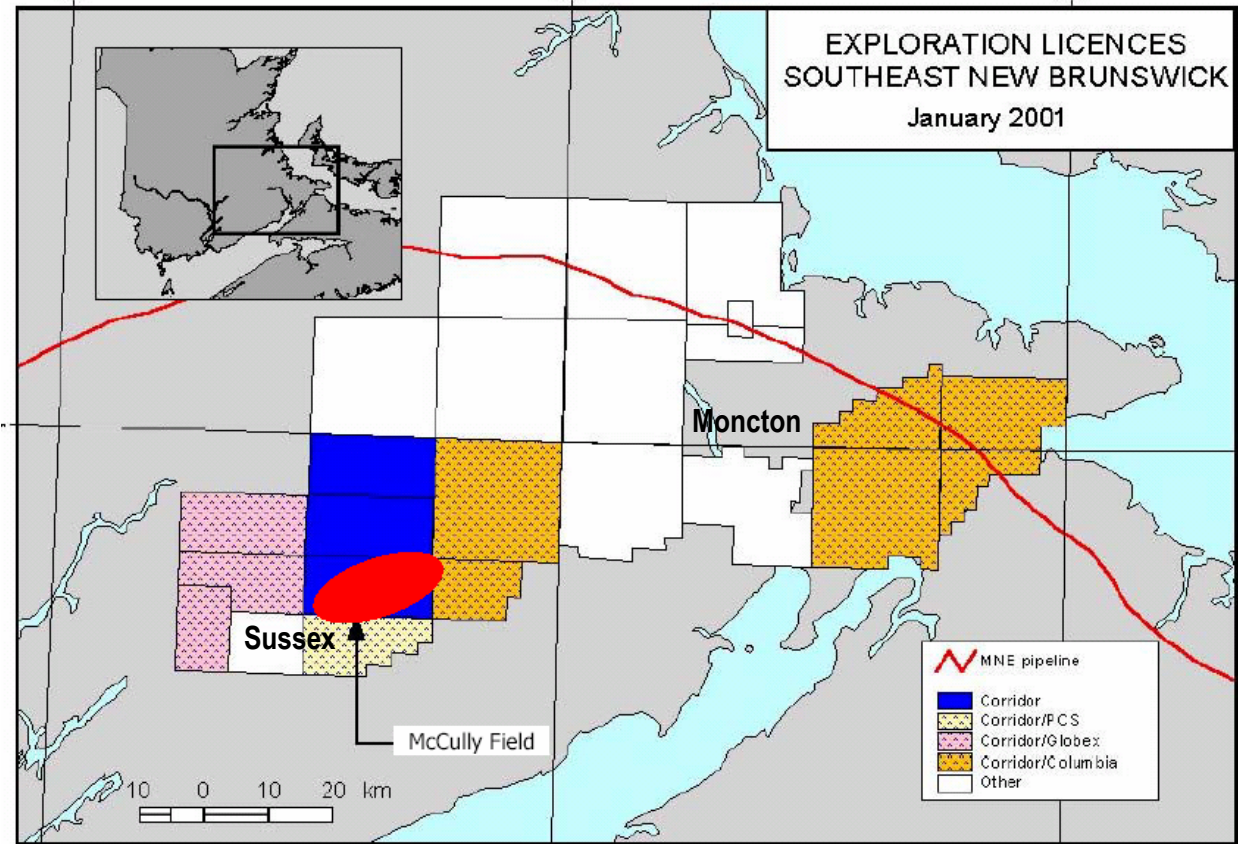
## 2.5 Direct Economic Benefits From Exporting McCully Gas

There will be some limited economic benefit to the Sussex region even if a lateral pipeline is built and the gas is exported to other markets. This benefit will mostly occur during the construction phase. While a detailed assessment is not feasible, there are some indicatives of income/employment. During the construction phase an additional 26 wells will be brought into production and a 45 km lateral will be constructed. This represents construction activity in the order of \$42 million over three years. Construction activity will create estimated direct construction employment of 188 full time equivalent jobs per year, and \$4.9 million in household income, including spin-offs. This project is estimated to provide a total employment of 296 persons and generate household income in the area of some \$7.7 million.

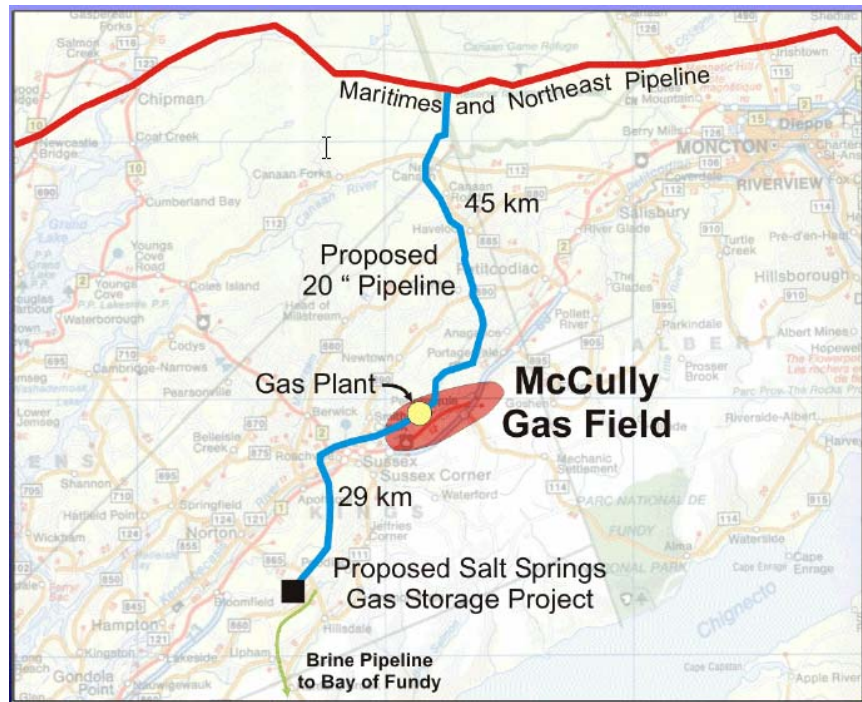
However, much of this initial direct benefit may occur outside the Sussex region depending on where the expenditures are made (i.e in Saint John or Moncton). In addition, the bulk of the economic benefit will only last a short time (1-3 years) with very limited direct economic benefit to the community once the pipeline is constructed and the wells are put into production.

The figures on the next page show the McCully field's location in southern New Brunswick as well as the proposed pipeline connection to the main MNP natural gas pipeline which runs 45 kilometres to the north of the McCully field.

## 2.6 Location of the McCully Field in Southern New Brunswick



**Proposed  
Connection of the  
McCully Gas Field  
to the MNP  
pipeline.**



### 3. Natural Gas: An Economic Development Driver?

Implicit in the title of this research project is that there is 'opportunity' for economic development resulting from the discovery of natural gas in the McCully Field near Sussex. However, is natural gas an important site selection element? Have other communities been able to leverage a low cost, local supply of natural gas into secondary economic development (i.e. manufacturing plants, etc.)?

After reviewing a number of site selection surveys and other research into the elements of a site selection decision, it is clear that government influenced factors such as incentives, tax rates and tax exemptions are considered to be the most important elements when considering where to locate a facility. However, among non-government influenced factors, energy costs are a very important site criteria. Table 3 shows the results of the recent Area Development magazine survey for 2003. The magazine has been conducting this survey of site selection consultants and industry professionals for a number of years.

**Table 3: Relative Importance of Site Selection Factors**

<u>Rank:</u>	<u>Site Selection Factor:</u>	<u>Rank:</u>	<u>Site Selection Factor:</u>
1	State and local incentives	14	Low union profile
2	Labor costs	15	Availability of broadband telecom
3	Availability of skilled labor	16	Right-to-work state
4	Highway accessibility	17	Proximity to suppliers
5	Occupancy/construction costs	18	Availability of long-term financing
6	Tax exemptions	19T.	Raw materials availability
7	Corporate tax rate	19T.	Availability of unskilled labor
8	Energy availability & costs	21	Accessibility to major airport
9	Proximity to major markets	22	Training programs
10	Availability of land	23	Proximity to technical university
11	Telecommunications services	24	Railroad service
12	Cost of land	25	Waterway/oceanport accessibility
13	Environmental regulations		

Source: Area Development 2003 Site Selection Survey

The general conclusion from this, and other site selection surveys, is that if a community, such as Sussex, is competitive on the other important elements the advantage of having low cost natural gas becomes a very valuable tool for economic development in the community.

**NOTE: Sussex, NB offers a strong value proposition for most of these site selection factors.**

The research reveals that natural gas is obviously more important to specific energy-intensive manufacturing industries such as chemicals, plastics and agri-food (see Section 7 below).

According to the National Association of Manufacturers (NAM) in the U.S., manufacturing firms require a relatively stable cost environment. The rapid rise in energy costs in recent years – particularly natural gas- has been a major challenge for manufacturers as these input cost increases directly affect the margins of these firms.

The NAM is calling for a new national policy on natural gas that focuses on increasing supply and fostering natural gas price stability.

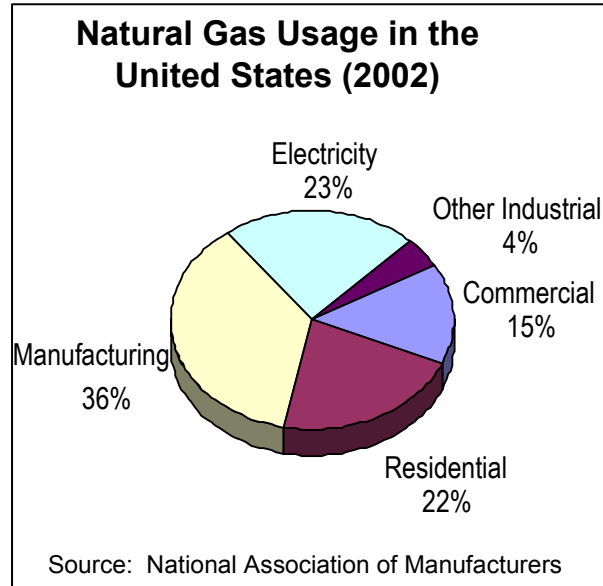


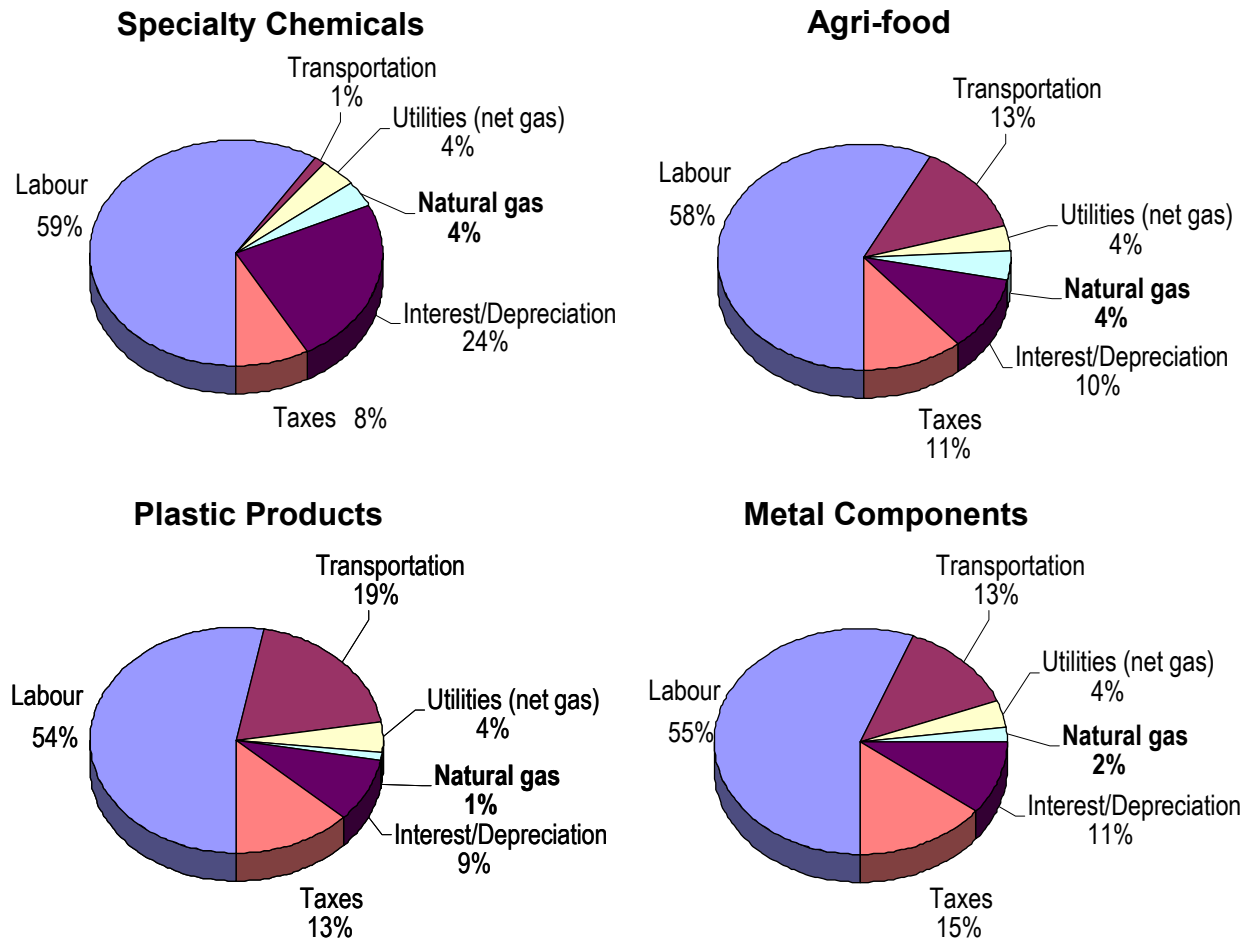
Figure 1

### 3.1 The Relative Importance of Natural Gas

The 2004 KPMG Competitive Alternatives Report looked at the operating costs of facilities in various industries in over 150 global locations. Figure 2 below shows the relative importance of natural gas in the four industries in the study that were significant users of natural gas. The sample agri-food manufacturing facility in that study was the second largest consumer of natural gas with a monthly consumption of 40,000 Ccf (113,314 M<sup>3</sup>). The annual cost of natural gas comprises approximately 4% of the location sensitive costs.

While the cost of natural gas is relatively low compared to labour costs, it is important to point out natural gas in recent years has become an unpredictable cost for manufacturers unlike labour and other cost elements which can be better managed. When the price of natural gas increases 70%, there are limited options for the manufacturer to adjust. Therefore, these cost increases directly impact the profitability of the companies.

## The Relative Impact of Natural Gas – % of Location-Sensitive Costs



83-City Average (North America)  
 Source: KPMG Competitive Alternatives Report 2004.

Figure 2

The KPMG study is important for Enterprise Fundy as it looks to build a value proposition for a region that would use natural gas as a key component. While the Sussex region was not included as part of this study, Fredericton, Saint John and Moncton were. How these cities fared on the various cost factors has important implications for the Sussex region as many of the cost variables would be similar or less than the larger NB cities. Table 4 below provides a summary of how New Brunswick's cities compared to the other 80 North American cities in the study.

New Brunswick's cities were highly competitive on the facilities costs (shown here as Interest/Depreciation) but have been slipping in the KPMG rankings in recent years. The three cities are still in the top quartile of locations but, using KPMG's methodology, are more costly for manufacturing than certain Quebec and other Atlantic Provinces-based cities. A relatively high tax burden combined with relatively high transportation costs and labour costs that are higher than many other locations drive this result.

**Table 4: Relative Importance of Location-Sensitive Cost Factors**

<b>Cost Variable:</b>	<b>NB Rank (out of 83 cities)</b>	<b>Lowest Cost locations:</b>	<b>Weight:</b>
<b>Total Location-Sensitive Costs</b>	<b>15, 16, 17</b>	<b>Alma; Trois-Riviere; Sherbrooke; Pictou; Charlottetown</b>	<b>100%</b>
Total Labour	16, 17 20	Pictou; Truro; Sydney; Sault St. Marie; Prince Albert	56.6%
<b>Natural Gas</b>	<b>41, 42, 43</b>	<b>Calgary; Lethbridge; Edmonton; Grande Prairie; Red Deer</b>	<b>2.8%</b>
Electricity	17, 18, 19	Brandon; Winnipeg; Moose Jaw; Prince Albert; Regina	3.8%
<b>Total Taxes</b>	<b>55, 56, 57</b>	<b>Seattle; San Jose; Portland; Riverside; Boston</b>	<b>11.5%</b>
Transportation Costs	37, 47, 50	St. John's; Seattle; Portland; St. Louis; San Jose	10.9%
<b>Interest/Depreciation</b>	<b>5, 9 18</b>	<b>Truro; Charlottetown; Sherbrooke; Saint John; Pictou</b>	<b>14.1%</b>

Source: KPMG Competitive Alternatives Report 2004.

## 3.2 Conclusion

From the KPMG Competitive Alternatives report and other sources, it is clear that natural gas is an important criteria but not in the top five most important factors except in very rare cases such as chemical plants, aluminum smelters and power production plants.

However, site selection consultants and recent literature on the subject confirm that low cost natural gas can be a powerful incentive as part of an overall value proposition (see Section 10 below for a review of jurisdictions that have leveraged natural gas into secondary economic development). The key to a successful economic development strategy is to develop a powerful, overall program to attract industry of which natural gas is a key component (see Section 5 below for a review of the Sussex value proposition).

## 4. Natural Gas Pricing

Just having a local supply of natural gas does not constitute in itself a distinct economic advantage for the Sussex region. Natural gas is readily available to most of the jurisdictions in Canada and the U.S. that are competing for new manufacturing and other business expansions. The potential economic advantage comes from being able to offer 'low cost' natural gas to industrial clients. This section will review the elements of natural gas pricing.

### 4.1 How Natural Gas Prices are Established

According to Canada's National Energy Board, the price that is paid by the end-users or consumers of natural gas is made up of the following components:

- the cost of the natural gas itself. This is referred to as the "commodity" cost (also known as the wellhead price);
- the cost of transporting the gas through pipelines. This is referred to as the transportation or transmission cost; and
- the local distribution cost.

The wellhead price of natural gas is not regulated in either Canada or the United States. It is determined in the open market and influenced by such factors as the cost of competing energy sources, weather, supply constraints and general economic conditions. In recent years, the price of natural gas has increased significantly with the average cost for industrial users in the United States increasing from \$3.12/MCF in 1999 to \$5.78/MCF in 2003 – an 85.3% increase. Residential prices, which include higher transportation/distribution charges, also increased but not as fast – rising 42% in the same time frame<sup>3</sup>.

The main reason why natural gas prices increased more for industrial users is that they pay as much as 80% less in distribution charges compared to residential users and therefore the industrial price is tied more closely to the commodity or wellhead price. A recent study by the US Energy Information Administration found that for the average residential user, only 34% of the total cost of their natural gas bill went to the producer of the gas (Figure 4). 66% of the cost included the components associated with transporting and distributing the gas to the end users.

The transportation component of natural gas is related to the main pipeline carrying the gas to the 'city gate' or to the point where local distribution companies then furnish residential and industrial users. A recent National Energy

Board report indicates that the cost of gas 'delivery' in Canada has been decreasing in recent years as a result of increasing commodity costs. For example, in British Columbia in 1999, the cost of gas 'delivery' was approximately 50% of the overall cost to residential users. By 2002, that figure had dropped to 28%. Similar shifts have occurred in Alberta and Saskatchewan. However, in Quebec, the cost of gas delivery in 2001 was over 70% of the total end cost to the user.

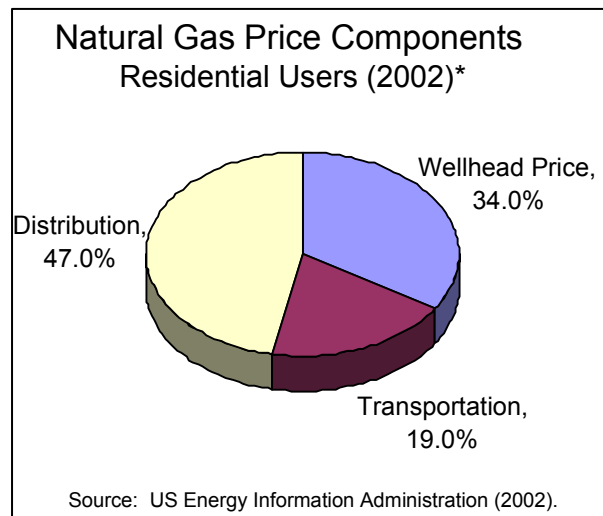


Figure 3

<sup>3</sup> Source: US Energy Information Administration (2004).

**The key finding is that the cost to transport and distribute the gas both to residential and industrial users is a significant part of the overall price to the end user.**

Therefore, the price of natural gas for industrial users does vary significantly from market to market. The U.S. Energy Information Administration and Statistics Canada compile and report data on industrial pricing. Table 5 below shows the average industrial price of natural gas for U.S. states and Canadian provinces where natural gas is currently available. Average prices are not available for the New Brunswick and Nova Scotia markets as there is a very small level of activity.

## 4.2 Industrial Natural Gas Rates

In terms of average industrial prices, New England is the highest cost location for natural gas. Ontario and British Columbia also have high average prices. The lowest cost locations for the cost of natural gas for industrial users are in the mid and southwestern U.S. areas. There are two notable exceptions. Vermont offers comparatively low natural gas costs for industrial users (see Section 8 below for additional information on the Vermont market). Alaska's natural gas is stranded from major North American markets thus its low industrial price. There are plans to build a major pipeline to transport this gas into the North American distribution system.

**Table 5: Average Industrial Price (2003) - Per Mcf**

State/Prov:	Avg. Price	State/Prov:	Avg. Price	State/Prov:	Avg. Price
Hawaii	11.82	California	7.21	Washington	6.06
Maine	10.23	Illinois	7.21	Kansas	5.92
Massachusetts	10.01	Florida	7.15	Minnesota	5.90
New Hampshire	9.77	South Carolina	6.96	Idaho	5.89
Maryland	9.57	<b>Alberta</b>	<b>6.91</b>	Oregon	5.84
<b>Ontario</b>	<b>9.39</b>	<b>Saskatchewan</b>	<b>6.90</b>	Georgia	5.83
<b>British Columbia</b>	<b>8.99</b>	Arkansas	6.90	Tennessee	5.83
Nevada	8.68	Virginia	6.72	Nebraska	5.74
Indiana	8.68	Wyoming	6.72	South Dakota	5.70
Ohio	8.32	Kentucky	6.68	Montana	5.66
Rhode Island	8.17	Alabama	6.66	Michigan	5.60
Pennsylvania	8.11	Iowa	6.56	North Dakota	5.60
Missouri	8.00	Mississippi	6.54	Louisiana	5.55
<b>Quebec</b>	<b>7.91</b>	Arizona	6.52	Texas	5.39
New York	7.82	Delaware	6.45	Vermont	5.08
<b>Manitoba</b>	<b>7.56</b>	New Jersey	6.44	Utah	5.03
Oklahoma	7.44	West Virginia	6.40	Colorado	3.89
Wisconsin	7.33	North Carolina	6.20	Alaska	1.81
Connecticut	7.23	New Mexico	6.14		

Sources: US EIA and Statistics Canada. Conversion at \$1.33 CDN = \$1.00 USD.

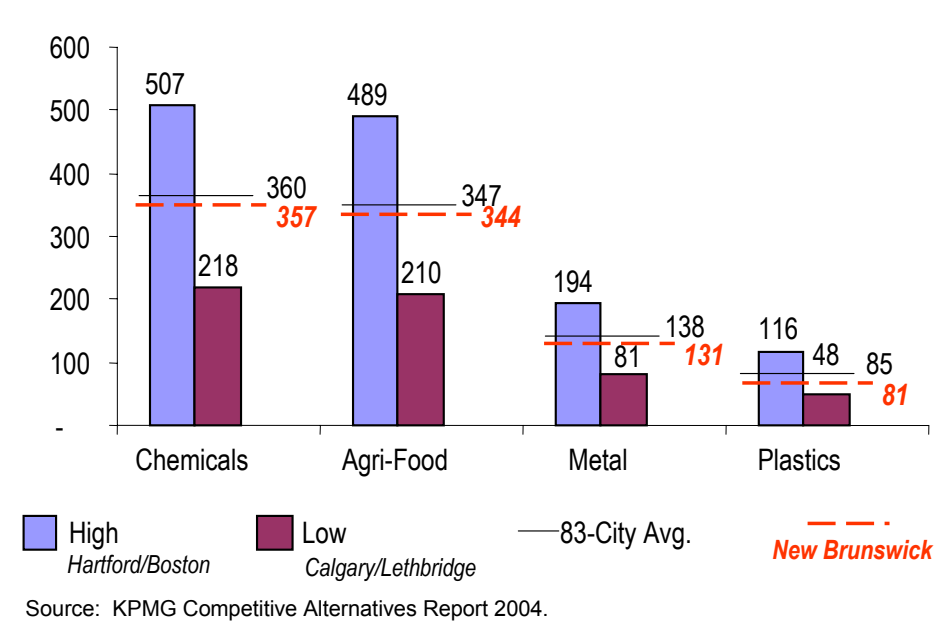
**NOTE: Because of the current limited size of the market in Atlantic Canada, no provincial average rates are published by Statistics Canada. However, from the KPMG report, the industrial rate was published at \$7.44 (US\$).**

Table 5 above shows the average cost of industrial gas in North America. The 2004 KPMG Competitive Alternatives report looked at the cost of natural gas for various manufacturing uses in 83 North American locations including New Brunswick and Nova Scotia.

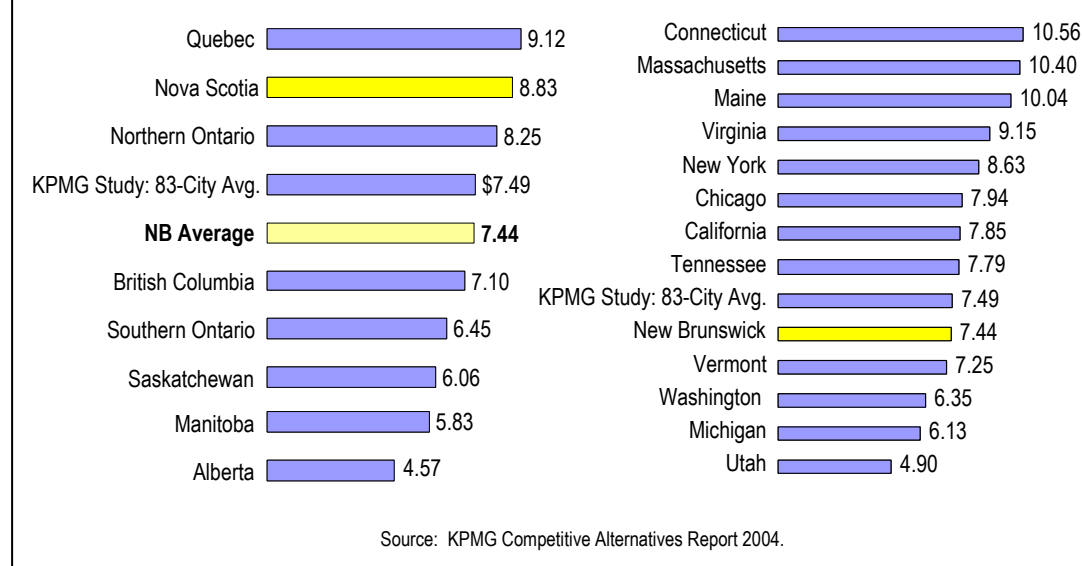
The KPMG report confirms that there is a significant variation in the cost of natural gas for industrial users in North America. The cost of natural gas for industrial users in Calgary and Lethbridge is over 57% cheaper than in the Hartford and Boston

markets for the four industries that are major users of natural gas: chemicals, agri-food, metal components and plastics. The current price for industrial gas for New Brunswick customers (in the three major cities) is slightly below the average North American cost but still significantly higher than competing jurisdictions such as Alberta, Saskatchewan and southern Ontario. New Brunswick's current industrial natural gas cost is lower than the majority of U.S. states but higher than many competitor jurisdictions in the mid-west and southwest USA.

**Figure 4: Variation in Natural Gas Costs \$000 USD**  
Average annual natural gas costs by industry



**Figure 5: Industrial Natural Gas Price by Region per Mcf (US\$)**  
Versus Canada                      Versus USA



**NOTE: Natural gas in New Brunswick and Nova Scotia comes from the Sable Island reserves which have a very high cost of production.**

Another important competitive factor is that natural gas costs in Canada are generally lower than other international locations as shown in Figure 7. The average industrial price of natural gas in Canada is 27% lower than France and 32% lower than Ireland which has emerged in recent years as a key competitor for foreign direct investment.

Natural gas costs in Canada are also lower than many of the eastern European countries which are beginning to attract a significant amount of western European and North American manufacturing investments.

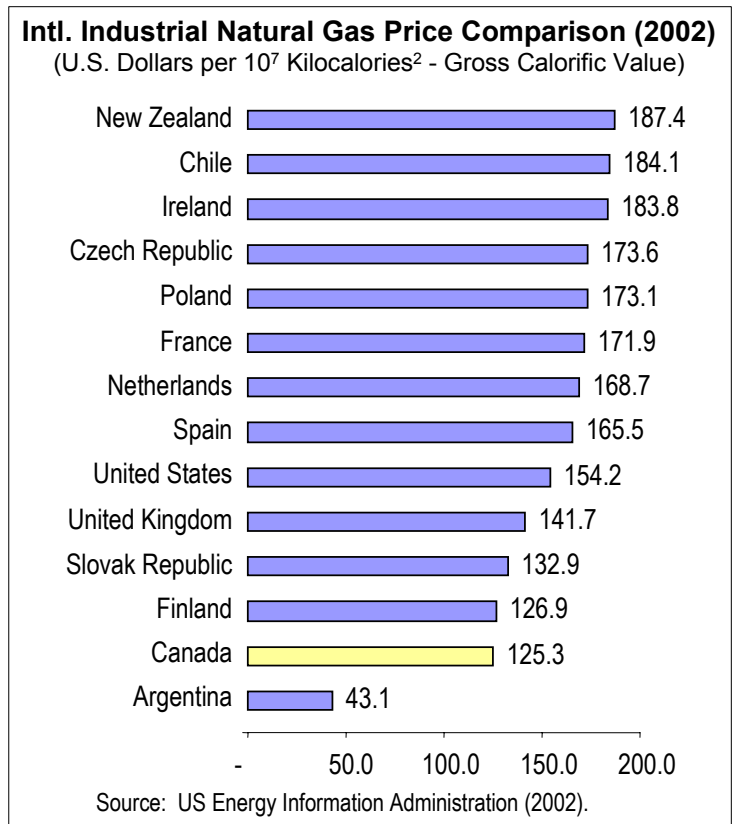


Figure 6

## 4.3 Natural Gas Price Variability – Drilling Down

The research indicates that there are three main elements<sup>4</sup> influencing the variability in end natural gas prices to industrial users<sup>5</sup>:

- The transmission costs
- The local distribution charges
- Price negotiation

### 4.3.1 Sable Island Gas Example

- *Transmission Charges to Dracut:* A close to home example of natural gas price components is the gas flowing from Sable Island. This gas is transmitted to the Dracut hub in New England and sold into competitive markets to buyers. The MNP cost to transmit the gas from Sable to Dracut is regulated by Canadian and U.S. regulators and represents approximately \$1.47 (CDN\$) per Mcf transmitted.
  - \$0.72/CDN per Mcf to US border
  - \$0.75/CDN per Mcf from US border to Dracut
- *Distribution Charges:* Enbridge Gas NB has the general franchise for the distribution of gas within the Province of New Brunswick. How their distribution costs influence the price to the end industrial user is not in the public domain. However, other studies have confirmed that distribution charges for industrial users can vary significantly. One recent U.S. source pegs distribution charges for industrial users at between \$0.50 to \$0.90/Mcf.

**Using this information as well as National Energy Board statistics on the example in other provinces, transmission and distribution charges for industrial users may be in the range of 30% of the total cost per Mcf. Therefore, it may be possible to significantly reduce the price of natural gas by reducing or eliminating transmission and distribution charges while still allowing the supplier to achieve a market rate for their gas.**

### 4.3.2 Price Negotiation

However, it is important to point out that the price of natural gas for large users can be negotiated on a case by case basis. A major influence on the price of natural gas in New Brunswick is the cost of competing energy sources such as electricity and other fuels. For example, current in Atlantic Canada, the low cost of Bunker C fuel oil is putting competitive pressure on the price of natural gas.

### 4.3.3 Maturity of Markets

The cost to build infrastructure is a major driver of natural gas distribution charges. In competitive markets where the infrastructure costs are lower, local distributors have more ability to adjust their pricing downward to attract customers.

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<sup>4</sup> In theory, 'stranded' natural gas (i.e. that doesn't connect directly to the transmission system) could result in lower cost to the industrial user because there is limited or no competition for the gas.

<sup>5</sup> The royalty rate that governments charge can also impact the end price of gas (see section 4.3.4 below).

### 4.3.4 Natural Gas Royalties

Natural resources in Canada are owned by the Provinces; as such, royalties fall under provincial jurisdiction. However, natural resources in areas that are not provinces (such as offshore Nova Scotia) fall under federal jurisdiction.

Royalty rates are levied as a percentage of the market price of the gas. The rates also differ by the age of the gas. For example, older wells in Alberta are charged at 40% while newer ones have a 15% royalty rate. The rationale for this is that the producer can amortize their costs of exploration and production faster and when these costs are accounted for, the province takes a much higher share.

In New Brunswick, the royalty rate on natural gas is 10% of the actual selling price less a 'proportionate share of production, processing and transportation charges' (see inset). The 'proportionate share' would be determined on a case by case basis.

Because of the significant upfront cost to develop the offshore fields, Sable Island natural gas was given a 2% royalty rate (on gross revenues) until the project achieves payout (defined as project costs plus a return at 5% higher than a Canadian long term bond). After that, the royalty rate increases to 5% until the project achieves a return of return at 20% plus the Canadian long term bond rate and then the royalties are tied to the return up to a maximum of 35%. One analyst predicted that Sable gas would advanced to the 5% royalty rate in 2004-2005 but the low production level probably means that the 2% rate will be in effect for at least several more years.

**Without knowing the specific cost structure of McCully gas, it is impossible to estimate an effective royalty rate. It is clear that the New Brunswick rate is not structured to encourage new exploration.**

Table 6 shows the range of royalty rates on natural gas in five Canadian provinces.

**Interestingly, BC, Alberta and Saskatchewan have a variety of incentive programs and incentive rates to encourage new exploration and production while New Brunswick and Manitoba do not.**

#### New Brunswick Regulation 2001-66 Under The Oil And Natural Gas Act

The royalty on natural gas shall be ten per cent of the actual selling price or fair market value at the time and place of production, whichever is the greater, free and clear of any deductions.

- **22(3)** The royalty on all by-products obtained from oil or natural gas by processing or separation, including but not limited to sulphur, helium, natural gas liquids and condensate, shall be ten per cent of the actual selling price or fair market value at the time and place of production, whichever is the greater, less the lessee's or licensee's proportionate share of production, processing and transportation charges.
- **22(4)** Every sale of oil, natural gas or by-products from a lease area or license area shall include, and the lessee or licensee is authorized to include, the royalty share of the oil, natural gas or by-products belonging to the Province and the lessee or licensee shall for every sale account for and pay to the Minister the Province's royalty share by the twenty-fifth day of the month following the calendar month of the sale.

**Table 6: Natural gas royalty rates (2003)**

<u>Province:</u>	<u>Rate:*</u>
Alberta	15%-40%
British Columbia	8%-27%
Saskatchewan	15%-45%
Manitoba	12.5%
New Brunswick	10%
Sable Island	2%**

*\*Depends of age of the wells and if the gas is produced in association with oil.*

*\*\*Special royalty rate until producer achieves a return on investment from the project.*

## 4.4 Natural gas prices in Atlantic Canada

The National Energy Board publishes an annual report on the status of natural gas pricing in the Maritime Provinces. The NEB has concluded that prices charged in the Maritime provinces are consistent with the general conditions in any new market where there are considerable capital costs and costs to educate consumers on the new fuel alternative. The NEB found that residential prices are above the Canadian average due to the newness of the service and the lack of liquidity in the market.

The research above reveals that industrial prices for natural gas in New Brunswick are lower than other Atlantic Canada provinces and Quebec but higher than southern Ontario and the Prairie provinces (using KPMG data). This is partially due to Enbridge's need to keep the cost of natural gas competitive with other energy alternatives such as Bunker C diesel fuel and their desire to build market share by attracting industrial users.

Some central and western Canadian cities have used federal infrastructure funding to subsidize the building of natural gas infrastructure. This has a direct impact on the end price of natural gas – specifically in Manitoba and Saskatchewan.

## 4.5 The Impact of Local Supply on Price

Another important finding of this report is that as a general rule, areas with a local supply of natural gas have lower industrial prices than areas that do not. Alberta has among the lowest rates for industrial users (the lowest in the KPMG report) and also a major local supply. Texas, Utah and Colorado have low rates and also a significant local supply. Having a local supply, however, does not automatically translate into lower natural gas rates for industrial users. States such as Arizona, Oregon and Maryland have local supplies but also have above average prices for industrial users of natural gas.

There are also notable exceptions the other way – locations that do not have a local supply but that do offer low industrial rates. such as Vermont, West Virginia and Minnesota.

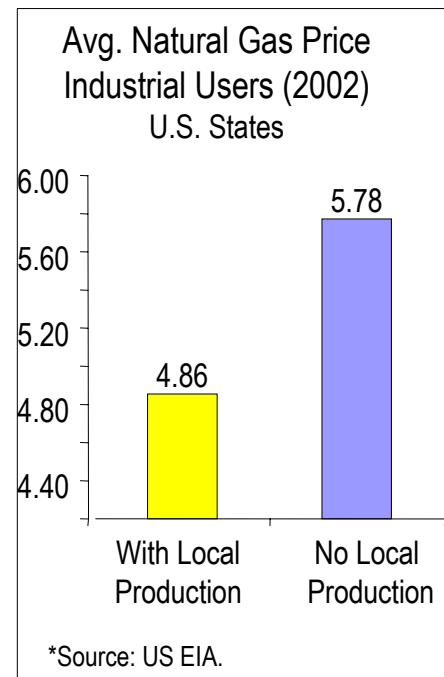


Figure 7

## 5. The Sussex Energy Park – A Concept

This section will explore the potential value proposition elements required in order for the Sussex region to be able to leverage a low cost supply of natural gas into economic development opportunities.

This report does not establish the specific industrial price that would be charged for McCully gas should Enterprise Fundy decide to create an 'Energy Park' and promote the region as a site for certain types of manufacturing and energy-intensive businesses. However, the report does establish that the cost of transmission and distribution of natural gas to industrial users can be a significant percentage of the overall price. If these costs can be minimized, in theory, the end price charged to industrial users should be lower without sacrificing the producer's need to make a reasonable return on their investment.

For example, if McCully gas was offered to local industrial users in an Energy Park adjacent to the gas wells at a 20% discount from the current industrial rates in New Brunswick (from the KPMG study), that would drive down the cost to below many of its competitor jurisdictions such as Southern Ontario and British Columbia. If a further reduction to 30% below was achievable, the Sussex Energy Park would have some of the lowest rates in the world.

As was discussed in Section 3, low cost natural gas alone will not be enough of an incentive to attract manufacturers and other large users of natural gas to the Sussex region. There are a number of communities across North America that offer below average natural gas prices for industrial uses that have not been able to leverage those low costs into new economic development.

However, using low cost natural gas as key part of the value proposition is a good idea. Medicine Hat, Alberta has labeled themselves the 'Gas City' and are building their whole economic development brand around the value that the gas sector brings to the community both as economic activity from the exploration and production of natural gas and its use in manufacturing and other secondary economic development. New York's Empire Zones promote their incentive rates for natural gas and other energy. There has been research done in recent years showing that economic development 'zones' such as New York's that offer a specific value proposition have worked well – especially in the United States. Plattsburgh, NY's Empire Zone (The Plattsburgh Air Base Redevelopment Corporation or PARC) has attracted over a dozen multinational firms to a community of under 18,000 people. Companies include: Bombardier, Pratt & Whitney, Westinghouse Stone Air and Wyeth Pharmaceuticals. The value proposition offered by PARC includes financial incentives such as wage and investment tax credits, utility rate reductions, income and real property tax credits, state sales tax exemptions, and low-cost loans. In addition, as a former military base, PARC has a wide variety of infrastructure in place for use by tenants. See section 10 below for more information on PARC.

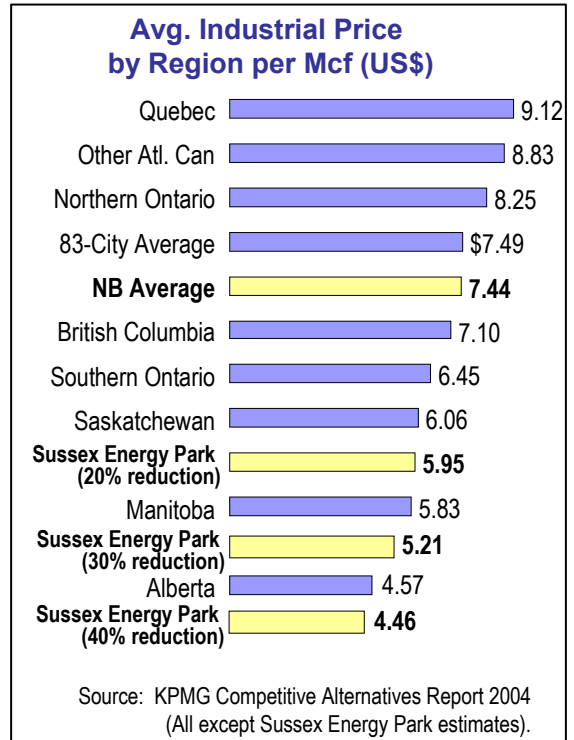


Figure 8

## 5.1 The Sussex Value Proposition

While smaller New Brunswick towns have not enjoyed much economic development success in recent years, there are many examples of communities in the 5,000 to 20,000 population range that have attracted significant new business investments by crafting a distinct value proposition and then aggressively marketing it in highly targeted ways. Slemon Park, on PEI, has built a highly successful aerospace cluster on the site of a former military base. Companies such as Honeywell Engines and Systems, Testori Americas, CAE Inc., Acro Helipro Global Services and MDS-PRAD Technologies Corporation have established major facilities in an area with only 14,000 people in the town of Summerside and 16,000 in the Census Agglomeration area.

What is the Sussex value proposition for new business investments? The following table provides some of the elements of this value proposition. It is based on Area Development magazine's site selection survey criteria.

<b>Strength:</b>	
<ul style="list-style-type: none"> <li>▪ Labour costs</li> </ul>	Labour costs are highly competitive due to the low cost of living in the area. The average earnings for full time workers is 30% lower than the Canadian average. In addition, New Brunswick offers US firms much lower fringe benefit costs. Employer paid health care premiums are a major cost for U.S. companies and have been rising significantly in recent years. Health care costs in New Brunswick are paid for by the government out of general revenues.
<ul style="list-style-type: none"> <li>▪ Availability of labor</li> </ul>	While the Town and Parish of Sussex only has just under 8,000 residents, there are 64,000 people in Kings County and there are some 300,000 people within an hour's drive of Sussex. In addition, the excellent four-lane highway both to Saint John and Moncton provides easy commuting. Many people commute back and forth along this system on a daily basis.
<ul style="list-style-type: none"> <li>▪ Highway accessibility</li> </ul>	A major, four-lane highway runs through Sussex connecting to Saint John, Moncton and to New England and Central Canada.
<ul style="list-style-type: none"> <li>▪ Construction costs</li> </ul>	New Brunswick offers one of the low cost construction environments in North America.
<ul style="list-style-type: none"> <li>▪ Land availability &amp; cost</li> </ul>	The Sussex region offers an ample supply of low cost land.
<ul style="list-style-type: none"> <li>▪ Energy costs</li> </ul>	Electricity costs for industrial users in New Brunswick are below the North American average.
<ul style="list-style-type: none"> <li>▪ Telecommunications</li> </ul>	New Brunswick has an excellent telecommunications infrastructure.
<ul style="list-style-type: none"> <li>▪ Environmental regulations</li> </ul>	While New Brunswick takes environmental issues very seriously, the specific legislation is not overly onerous for most industries.
<ul style="list-style-type: none"> <li>▪ Proximity to universities</li> </ul>	There are five universities and four community colleges within a 1.5 hour drive of Sussex.
<ul style="list-style-type: none"> <li>▪ Proximity to waterways</li> </ul>	The Port of Saint John is within 1 hour drive of Sussex.
<ul style="list-style-type: none"> <li>▪ Proximity to major markets</li> </ul>	Sussex is one day's shipping to the New England, New York and central Canadian markets.
<ul style="list-style-type: none"> <li>▪ Rail service</li> </ul>	CN Rail has a main line that passes close to the McCully field.
<ul style="list-style-type: none"> <li>▪ Proximity to Airports</li> </ul>	There are three airports within a 1.25 hours drive of Sussex. These airports offer a variety of connects including direct flights to the New England market.

## The Sussex Value Proposition: Challenges

There are, however; challenges facing the Sussex region inhibiting its ability to attract new investment.

Challenge:	
<ul style="list-style-type: none"> <li>▪ Government incentives</li> </ul>	<p>Over the past decade, the type of incentive packages offered by the various levels of government in New Brunswick has not been competitive for successfully attracting most manufacturing companies. Recent studies confirm that the value of the total incentive package offered to manufacturing firms in the U.S. has ranged between 30% and 40% of the total upfront cost associated with the establishment of the facility. This is primarily not 'cash' incentives, rather it most often takes the form of free land/ infrastructure, a wide variety of tax breaks, training support, etc. Interestingly, most of the New Brunswick government's incentive packages for the call centre sector have been in line with the range of 30%-40% of upfront capital costs. However, the initial costs of setting up a call centre facility are much lower than most manufacturing facilities which are not offered as generous incentives as a percentage of upfront capital costs. <b>NOTE: Incentives remain the number one site selection factor.</b></p>
<ul style="list-style-type: none"> <li>▪ Tax exemptions</li> </ul>	<p>There are very limited tax-based government incentives available in New Brunswick. These are widely used in the U.S. and also in Prince Edward Island and Newfoundland &amp; Labrador.</p>
<ul style="list-style-type: none"> <li>▪ Corporate tax rate</li> </ul>	<p>The total tax burden for New Brunswick manufacturers is significantly higher than in other jurisdictions. In the KPMG Competitive Alternatives report, New Brunswick cities ranked well below the average in this area.</p>
<ul style="list-style-type: none"> <li>▪ Skilled labour</li> </ul>	<p>Sussex is a small community located in a province with a limited population base. This can make the attraction of specialized labour more difficult than in a larger market.</p>
<ul style="list-style-type: none"> <li>▪ Energy availability</li> </ul>	<p>While the cost of industrial electricity is below average, there is an emerging power supply crisis in the Province which could impact the ability to attract major electricity users.</p>
<ul style="list-style-type: none"> <li>▪ Right-to-work state</li> </ul>	<p>This has been an important benefit to a number of U.S. states that have successfully attracting manufacturing industries in recent years. New Brunswick's legislation requires that all employees in a unionized environment must join the union.</p>
<ul style="list-style-type: none"> <li>▪ Proximity to suppliers/raw materials</li> </ul>	<p>There are a variety of raw materials in the Maritime provinces that could be processed here before being shipped to markets. Certain agri-food and wood manufacturers could benefit from this local supply. However, a significant amount of manufacturers would have to ship in their raw materials from sources elsewhere.</p>

### **5.1.1 The Importance of Marketing**

Another key challenge for the Sussex region is the marketing of the community. Recent ACOA research confirmed that Atlantic Canada is still one of the last regions that U.S. business leaders consider when evaluating potential sites for a new facility. Sussex, as a small community within Atlantic Canada, is challenged by this reality. However, as in the case of Slemon Park and elsewhere, if Sussex can use highly targeted methods to promote itself and offer a unique value proposition it should be able to attract investment.

The provincial department Business New Brunswick has a mandate to promote the province to outside industries. They will be a key partner in this initiative by leveraging their networks and marketing activities to highlight the benefits of the Sussex Energy Park.

## 6. Regulatory Environment

The price that is paid by the end-users or consumers of natural gas is made up of the following components:

- a) the cost of the natural gas itself (for example, the price paid by local distribution companies for the gas it purchases on behalf of consumers). This is referred to as the "commodity" cost;
- b) the cost of transporting the gas through pipelines. This is referred to as the transportation or transmission cost; and
- c) the local distribution cost.

### a) Natural Gas Commodity Cost

Natural gas commodity prices are negotiated between sellers and buyers of natural gas under various contract terms including length of contract and quantity. Some key factors which affect the commodity price include: supply, demand, storage levels in North American gas markets and taxes. Typically, prices increase during the winter months when demand is greater and decrease during the summer months when demand is lower. Natural gas prices are also influenced by oil prices to the extent there is competition between oil and gas, particularly in some industrial and electricity generation markets (i.e. used as fuel to produce electricity). While oil prices are determined on the world market, and have increased significantly over the past few months. Natural gas prices are less influenced by developments outside North America.

### b) Pipeline Transportation Cost

Pipeline transportation costs are the costs incurred in order to bring natural gas from the producing provinces to local distribution systems. These costs are made up of the tolls and tariffs that apply when transporting the gas through the pipelines. Interprovincial transportation tolls are determined by the pipeline company and must be approved by the National Energy Board.

### c) Local Distribution Cost

Local distribution costs are the costs incurred to transport natural gas to customers or consumers through the local company's system. Distribution rates are usually established once a year, and are regulated at the provincial level. There has been a move by some provinces and states to deregulate the distribution of natural gas.

## 6.1 Who regulates natural gas prices?

- Natural gas "commodity" prices are **unregulated** and **vary according to prevailing market conditions**. Supply concerns, the weather and general economic conditions can influence prices. While the prices negotiated between buyers and sellers are not regulated, the commodity price charged by a local distribution company or gas suppliers to its customers must be authorized at the provincial level.
- The local distribution rates are regulated by provincial regulatory boards or commissions or directly by a provincial government. The provinces establish rates that are just and reasonable for each of the local distribution companies within a province.
- Interprovincial and international pipeline transportation costs are regulated by the National Energy Board (NEB) and are determined through a public hearing process or through negotiations between pipeline companies and shippers. Even negotiated settlements must be approved by the NEB.

## 6.2 The McCully Natural Gas Field Context

In New Brunswick, the New Brunswick Public Utilities Board is responsible for the regulation of natural gas. The Gas Distribution Act, 1999 set out the conditions under which natural gas is distributed in the province. The legislation does include provisions for local gas producers in specific geographic areas.

*The Board may grant a general franchise, a local gas producer franchise or a single end use franchise to a person who has submitted an application under subsection*  
[Excerpt from Gas Distribution Act, 1999].

*When a local gas producer has submitted an application for a local gas producer franchise to the Board to distribute gas and offer a customer service within a gas distributor's general franchise, the Board may authorize the producer to do so, where it is satisfied that the customers of the gas distributor would not be materially prejudiced by authorizing the local gas producer to serve the part of the gas distributor's general franchise to which the application relates.*  
[Excerpt from Gas Distribution Act, 1999].

The New Brunswick Public Utilities Board can allow for local gas production and distribution to local customers as long as customers of the gas distributor (Enbridge) would not be materially prejudiced. Given that Enbridge does not service the Sussex region currently and has no plans to do so in the immediate future, it seems to reason that single end use franchises could be awarded to local users of gas from the McCully field.

The PUB has shown a sensitivity to the financial challenges facing Enbridge as it builds the natural gas market in New Brunswick. In a recent example, the Flakeboard plant in St. Stephen applied to the PUB for a single use franchise and the board recommended that Enbridge and Flakeboard work out an agreement – which they did and now Enbridge is the supplier of gas to the Flakeboard plant.

However, the objective of the Sussex Energy Park is to attract new companies – business that Enbridge would not have been able to access under the current model for natural gas distribution in the province.

## 7. Major Users of Natural Gas

There are a number of industries that require a significant amount of energy, specifically natural gas, in the production of their goods. The U.S. Manufacturing Consumption of Energy Survey tracks energy consumption among industries in the U.S. to the six-digit NAICS (North American Industrial Classification System) level.

The top energy consuming industries per dollar of valued added is shown in Table 7 below. A number of wood-related manufacturing industries rank among the top users of energy.

**Table 7: Consumption Ratios of Fuel among US Manufacturing Industries**

NAICS Code(a)	Subsector and Industry	Consumption per Dollar of Value Added (thousand Btu)	Consumption per Dollar of Value of Shipments (thousand Btu)	Consumption per Employee (million Btu)
325311	Nitrogenous Fertilizers	194.0	83.3	41,266.1
322110	Pulp Mills	158.2	70.0	26,670.2
324110	Petroleum Refineries	151.2	30.3	55,014.0
331312	Primary Aluminum	105.0	36.0	12,614.8
322130	Paperboard Mills	103.1	48.1	18,855.4
327310	Cements	99.6	59.3	21,977.8
325181	Alkalies and Chlorine	97.3	49.4	26,135.9
331111	Iron and Steel Mills	72.5	30.5	11,341.6
325110	Petrochemicals	67.2	31.3	51,537.4
311221	Wet Corn Milling	60.4	21.6	19,090.4
322121	Paper Mills, except Newsprint	58.3	30.4	10,415.1
322122	Newsprint Mills	58.2	30.1	14,104.5
331112	Electrometallurgical Ferroalloy Products	50.2	20.1	7,887.5
325192	Cyclic Crudes and Intermediates	49.5	17.7	9,951.5
325120	Industrial Gases	46.1	28.7	13,960.5
325212	Synthetic Rubber	39.4	18.1	8,931.5
325199	Other Basic Organic Chemicals	38.1	18.6	11,604.9
325312	Phosphatic Fertilizers	33.5	12.5	8,578.0
325188	Other Basic Inorganic Chemicals	25.8	16.8	5,313.4
321113	Sawmills	23.7	7.4	1,537.9
325211	Plastics Materials and Resins	19.5	9.1	6,407.5
325222	Noncellulosic Organic Fibers	16.5	8.8	2,769.6
321114	Wood Preservation	16.0	3.0	1,266.0
331511	Iron Foundries	13.1	8.0	1,140.6

Source: U.S. Manufacturing Consumption of Energy Survey – 1998.

The survey also provides a further breakdown of major energy consuming sectors. Food, wood, chemical and fabricated metal products are above average energy consuming industries. Table 8 shows the major sub-sectors by industry:

**Table 8: Energy-Intensive Manufacturing Sectors**

**Food and Kindred Products**

- Meat Packing Plants
- Canned Fruits and Vegetables
- Frozen Fruits and Vegetables
- Wet Corn Milling
- Bread, Cake, and Related Products
- Cane Sugar, Except Refining
- Cane Sugar Refining
- Beet Sugar
- Soybean Oil Mills
- Malt Beverages

**Wood Products**

- Sawmills and Planing Mills, General
- Softwood Veneer and Plywood
- Reconstituted Wood Products

**Chemicals and Allied Products**

- Alkalies and Chlorine
- Industrial Gases
- Inorganic Pigments
- Industrial Inorganic Chemicals, nec
- Plastics Materials and Resins
- Organic Fibers, Noncellulosic

**Fabricated Metal Products**

- Industrial Machinery and Equipment
- Electronic & Other Electric Equipment
- Transportation Equipment

Source: U.S. Manufacturing Consumption of Energy Survey – 1998.

## 7.1 Targeting Potential Leads for the Sussex Energy Park

The next step in the process would be to identify potential targets for the Sussex Energy Park that are significant users of energy – particularly natural gas – and then cross reference these targets against other site selection factors. A comprehensive lead generation process is well beyond the scope of this research project. However, the following provides a high level review of the steps required to identify potential leads and then qualify them into suspects:

**Indicators of Potential Expansion:**

- Fast growing (revenues/employees)
- New growth capital – has the company set aside funds for expansion
- Potential consolidation – is the company in consolidation mode?
- Rumour of expansion/announced upcoming expansion

**Other Beneficial Features:**

- Current presence in Atl. Canada – **studies have shown that companies that are already familiar with the regional market are far more likely to make additional investments here.** This includes domestic firms as well as foreign firms that are already in the regional market. See Table 9 for a recent list of foreign firms with manufacturing in Atlantic Canada.
- Have partnership/ collaboration in Atl. Canada
- Senior manager is graduate of Atl. Canada university/college
- Senior manager is expatriate Atl. Canada
- Have a current presence in Canada

**Table 9: Foreign Companies with Manufacturing Operations in Atlantic Canada**

<b>Company:</b>	<b>Target of FDI:</b>	<b>Source of FDI:</b>	<b>Company:</b>	<b>Target of FDI:</b>	<b>Source of FDI:</b>
Acan Windows Inc.	NF	Korea	Marden-Wild Of Canada Ltd.	NS	USA
AMCOR Twinpak Atlantic Inc.	NB	Australia	<b>Michelin North America (Canada) Inc.</b>	<b>NS</b>	<b>France</b>
Atlantic Fine Yarns Inc.	NB	UK	Newfoundland Hard Rok Industries	NF	Norway
AV Cell Inc.	NB	India	North Atlantic Ltd.	NF	Netherlands
Bowater Couturier Inc.	NB	USA	Nystone Chemicals Ltd.	NS	USA
Bowater Maritime (Mill)	NB	USA	Oland Breweries Ltd.	NS	Belgium
Bowater Mersey Paper Co.	NS	USA	PCI Chemicals Canada Co. Inc.	NB	USA
Canexcel Hardboard Siding	NS	USA	Pratt & Whitney	NS	USA
Carino Co. Ltd.	NF	Norway	Quartzitec	NB	
Composites Atlantic	NS	France	Reinforced Plastic Systems Inc.	NS	UK
Crossley Carpet Mills Ltd.	NS	USA	SABIAN Ltd.	NB	Bermuda
Crown Tanks Of Canada Ltd.	NB	USA	Saeplast Canada Inc.	NB	Iceland
Cutler Hammer Engineering	NB	USA	Smurfit Stone Container Canada Inc.	NB	USA
Eastern Optical Labs Ltd.	NS	France	St. Anne-Nackawic Pulp Co. Ltd.	NB	USA
EFKA Canada Ltd.	NB	UK	Stabil Drill Specialties Inc.	NF	USA
Enflo Canada Ltd.	NB	USA	Stora Enso Port Hawksbury Ltd.	NS	Finland
Flake Board Co. Ltd.	NB	Germany	Sunshine Mills	NB	Pakistan
Helly Hansen Canada Ltd.	NS	Norway	Swedwood Canada Ltd.	NS	Sweden
Hermes Electronics Inc.	NS	UK	Tann Paper Ltd.	NB	Austria
Honeywell	PE	USA	Trentonworks Ltd.	NS	USA
Imperial Oil (Refinery)	NS	USA	Uponor Canada Inc. (Wirsbo)	NB	USA
Kanalfakt	NB	Sweden	Urban Machinery Canada	NB	Germany
Kimberly Clark Nova Scotia	NS	USA	Venture Lighting Power Systems NA	NS	USA
Labatt Breweries Of Canada	NF	Belgium	WHK Woven Labels	NB	China
<b>Lafarge Cement</b>	<b>NS</b>	<b>France</b>	Woodchem Canada Ltd.	NB	Greece
Lafarge Gypsum Canada Inc.	NF	France			

Source: Atlantic Provinces Economic Council (2003).

**NOTE: Lafarge Cement and Michelin are two examples of regional manufacturers that could benefit from low cost natural gas.**

## 7.1.1 Specific Examples

By using a variety of databases, a directory of high energy consuming firms can be cross-referenced with the growth potential indicators listed above. The following is a high level list of potential targets in industries that require significant energy consumption. Should Enterprise Fundy move ahead with the Sussex Energy Park concept, a more comprehensive list of targets should be developed and a sales process initiated.

### Specific Regional Examples:

- **Cement Manufacturing** - One of the largest industrial users of energy is the cement sector (NAICS 327310). Currently, raw material used in the production of cement is extracted in Havelock, New Brunswick (a very short distance from McCully) and transported to Nova Scotia for production. The company involved may consider expansion into the Sussex Energy Park which is closer to its raw materials supply and a cheap source of energy.
- **Rubber Products** - Michelin Tires, one of the largest producers of automobile tires in the world, has three plants in Nova Scotia employing some 2,500 person. This one company represents the second largest export from Nova Scotia with over \$700 million in international exports per year. The raw materials used in the three plants is brought in by rail from outside sources. This raw material could be produced in the Sussex Energy Park and could advantage of cheap energy costs.
- **Juice Concentrating** - Oxford Frozen Foods, based in Oxford, Nova Scotia, is one of the largest frozen fruit producers in the world. The company has a strong Maritime Canada presence and has been exhibiting strong growth. The process of creating fruit juice concentrates requires a significant amount of heat and would be a very large user of natural gas or another alternate energy source. New Brunswick's McCain Foods is also a major producer of frozen juices and other frozen food products that require a significant amount of energy and would benefit from low cost natural gas.

### External Examples:

#### Frozen Foods (NAICS 31141)

Company:	Location:	Products:	Rationale for Selection:
Kahiki Foods	Ohio	Pan-Asian frozen food products	63% growth in sales, new facility may be required
Sadia S.A.	Brazil	Frozen food – particularly meat-based	\$1.8 billion sales, 54% growth in sales, expanding aggressively into international markets.
Dr. August Oetker KG	Germany	Frozen foods - pizzas	\$5.3 billion in sales, 40% growth in sales, major expansion into Canadian market with frozen pizzas.
The Schwan Food Company	Minnesota	Frozen foods - pizzas	#2 frozen-pizza maker in the US, 35% growth in sales.

### Fabricated Metal Products (NAICS 332)

<b>Company:</b>	<b>Location:</b>	<b>Products:</b>	<b>Rationale for Selection:</b>
Oystertec plc	UK	Hydraulic fittings for use in automobiles and other sectors	1,800% growth in sales and grew from 200 to 1,700 employees in one year.
MI Home Products Inc	Pennsylvania	Storm doors and windows, etc.	233% growth in sales, tripled the size of the workforce. Beginning to export. Has Home Depot and other clients with Canadian markets.
Surface Transforms PLC	UK	Carbon fiber ceramic products for use in the manufacturing of aircraft, automobiles, and other applications	Recent start up – requires significant energy usage. Does not have a North American facility as of yet.
Riviera Tool Company	Michigan	Die systems for the high-speed production of sheet metal parts for the automotive industry.	150% increase in sales, 34% increase in employees, major Canadian customers.
Maverick Tube Corporation	Missouri	Steel tubular products	100% sales growth, 30% employees growth, major oil & gas industry sales.

## 8. Locations with High Energy Costs

Using the KMPG Competitive Alternatives report, the U.S. Department of Energy database and other sources, the regions in North America that are saddled with the highest energy costs can be determined. The two main regions in the U.S. faced with high energy costs (including natural gas costs) are California and the eastern seaboard of the U.S. from Maine down to Washington, D.C. Energy costs below Washington become more competitive until Florida where costs are well above average. The map below shows the regions in North America facing the highest energy costs.



Legend: ◆ Areas where both electricity and natural gas costs are above average.

Table 10 below show the highest cost location in North America for both electricity and natural gas based on a specific plastics manufacturing plant. The figures are shown in U.S. dollars and taken from the KMPG Competitive Alternatives report. New England dominates as the highest cost location for natural gas. Quebec communities also have relatively high natural gas rates even though their electricity rates are among the lowest in the KMPG study. California and eastern U.S. cities had the highest electricity rates. Alberta is the inverse of Quebec with above average electricity costs while having among the lowest natural gas rate in North America.

**Table 10: Highest Cost Locations: Annual Energy Costs**

**Plastics Manufacturing Facility**

KPMG Competitive Alternatives Report (2004)

Electricity		Natural Gas	
<u>Community:</u>	<u>(US \$000)</u>	<u>Community:</u>	<u>(US \$000)</u>
Riverside, CA	786	Hartford, CT	116
New York, NY	670	Boston, MA	114
San Diego, CA	670	Tampa, FL	113
San Jose, CA	665	Lewiston, ME	110
Seattle, WA	609	Dothan, AL	103
Buffalo, NY	555	Atlanta, GA	103
Boston, MA	540	Greenville, SC	102
Lewiston, ME	513	Providence, RI	100
Burlington, VT	499	Alma, QC	109
Philadelphia, PA	497	Montreal, QC	109
Chicago, IL	481	Quebec City, QC	109
Newark, NJ	451	Sherbrooke, QC	109
Hartford, CT	417	Trois Riviere, QC	109
Las Vegas, NV	403	North Virginia, VA	100
Detroit, MI	391	Pictou, NS	94
Providence, RI	404	Truro, NS	94
Calgary, AB	395	Halifax, NS	92
Wichita, KS	365	Sydney, NS	92
Kawartha Lakes, ON	356	Belleville, ON	95
Raleigh, NC	349	Newark, NJ	95
Lethbridge, AB	344	Charlottetown, PE	89
Milwaukee, WI	338	Buffalo, NY	95
Toronto, ON	330	New York, NY	95
Edmonton, AB	334	Raleigh, NC	95
Atlanta, GA	318	Philadelphia, PA	94
Phoenix, AZ	320	St. John's, NF	88
Cedar Rapids, IA	317	Sault St. Marie, ON	92
Sudbury, ON	313	Sudbury, ON	92
Red Deer, AB	315	Indianapolis, IN	92
St. Louis, MO	315	Thunder Bay, ON	88
Columbus, OH	305	Chicago, IL	87
Ottawa, ON	287	Lexington, KY	86
Waterloo, ON	306	St. Louis, MO	86
Nashville, TN	297	Nashville, TN	85
Saginaw, MI	299	Wichita, KS	84
Portland, OR	302	Milwaukee, WI	83
North Virginia, VA	291	Riverside, CA	83
Charlottetown, PE	287	San Diego, CA	83
Indianapolis, IN	282	San Jose, CA	83
<b>New Brunswick</b>	<b>234</b>	<b>New Brunswick</b>	<b>81</b>

## 9. Potential Anchor Projects

A key dynamic to the development of McCully natural gas is the perceived need to build a lateral to connect the gas to the main MNP pipeline. However, the cost of building this 45 km pipe is significant. If a major user of natural gas agreed to purchase a significant amount of McCully reserves, the need for this lateral pipeline may be reduced or postponed to a future date. It could also mean that some gas could be made available for other smaller industrial users at prices that do not include transmission costs or the amortized cost of the 45 km pipeline.

There are several potential 'anchor' users of natural gas:

- A natural gas-fired power generation facility
- A co-generation plant
- A Gas-to-Liquids (GTL) plant
- A major user such as an aluminum smelter or chemical plant
- A local natural gas utility

### 9.1 Natural gas-fired power generation

Natural gas is increasingly becoming a preferred fuel for the production of electrical power. As Figure 10 shows, the amount of natural gas in the U.S. allocated to electricity production is expected to grow significantly in the next few years. This trend is being driven by several factors including the increasing concern over the environmental impacts of coal-fired, nuclear and hydro-electric production.

Orimulsion, a fuel that is made by adding water to bitumen, is another fuel that can be used to power electricity plants. It is cheaper than Bunker C fuel oil and has less environmental impact. However, the major

producer of Orimulsion, Venezuela, has placed production of the fuel on hold which has caused significant concern at

NB Power as they have already retrofitted the Colson Cove generating station to use the Orimulsion fuel.

Natural gas has historically been a cheaper alternative to oil for the production of electricity. However, in recent years the increasing price of natural gas has now made Bunker C (No. 6 Fuel Oil) a more attractive alternative based solely on price (as shown in Table 11 below). Coal is much cheaper than either natural gas or fuel oil but has a much higher environmental impact. In addition, the cost to extract the coal can fluctuate significantly. The costs associated with extracting the coal from New Brunswick sources is not public information; however, they must be considerably higher than the averages shown in Table 11 as NB Power had slated to close its coal producing facilities in New Brunswick on grounds that it was no longer economically viable. In 2004, NB Power announced that the high cost of oil and natural gas has made the extraction and use of local coal economically viable for at least several more years.

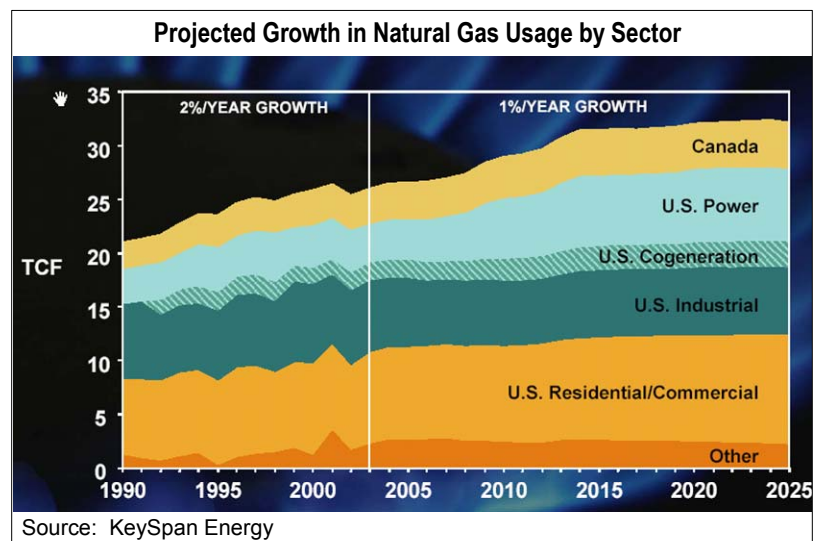


Figure 9

The U.S. Energy Information Administration believes that natural gas costs will remain high in relative terms but could moderate to levels at or below No. 6 Fuel Oil.

NB power officials were consulted as part of this research project. The intent was to assess under the current market conditions and with the unique particulars of the McCully gas field, is there potential for a natural gas-fired power generation. At current prices and reserve levels, NB Power Corporation believes that natural gas does not appear to provide a competitive generation alternative. In addition, discussions with system planners suggest a 50 MW gas unit would cost \$50 million (likely the minimum size they would consider) and would require 9 billion cu. ft. of gas per year. Given current reserve levels, according to NB Power, the unit would exceed capacity under a thirty year unit life and hence is not likely an active option for NB Power at this point in time.

**Table 11: Avg. US Price for Fuels Used in Electricity Production - 2003 (in \$USD)\***

	<u>Cents per million BTU</u>
Natural Gas (avg. US)	540.1
Bunker C (No. 6 Fuel Oil)	451.0
Coal	127.0

*\*Source U.S. Energy Information Administration.*

However, there are several factors that NB Power does not seem to be including in their analysis:

- The total amount of natural gas in the area is estimated to be 1 trillion cubic feet. Additional exploration activity is being planned to verify that quality of reserves. A scalable plant could be constructed that could initially produce a smaller amount such as 20 MW and then ramp up as new reserves come online.
- The relatively high cost of natural gas is expected to moderate and the cost of alternative fuels is expected to catch up over the next few years.

In order to adequately assess the potential cost benefits of McCully gas for electricity production, a simple pricing model would need to be constructed as shown in Table 12. Because the costs a specific utility would pay for these fuel sources are not public information, completing this table was beyond the scope of this research project.

**Table 12: Cost Matrix to Assess the Cost Benefits of McCully Gas for Electricity Production**

<b>Fuel Source</b>	<b>Volume to produce one million BTUs</b>	<b>Est. landed cost of this volume Cost per one million BTU</b>
No. 6 Bunker C Oil	Litres	n/a
Orimulsion	Litres	n/a
NB Coal	Kgs	n/a
Sable Island natural gas	Ccf	n/a
McCully (Sussex) natural gas	Ccf	n/a

NB Power is faced with a significant power production challenge over the next few years. The Point Lepreau nuclear generating facility is scheduled to be taken offline (or retrofitted at a cost that NB Power's consultant said was prohibitive) and the Colson Cove generating facility has been retrofitted to use Orimulsion. A 50 MW plant using McCully gas would only represent a small component of the new energy production capacity required by the province of New Brunswick.

As a result of new legislation in New Brunswick, other energy companies will be able to produce electricity in New Brunswick for use in the province and for export. Other energy companies such as Emera, Duke Energy (see below) and Ontario Power Generation should be considered as possible targets for an electricity production facility in the Sussex Energy Park.

## 9.2 A Co-generation Plant

Cogeneration (also combined heat and power or CHP) is the use of a power station to simultaneously generate both heat and electricity. CHP allows a more total use of energy than conventional generation, potentially reaching an efficiency of 70-90%, compared with approximately 50% for conventional plants. This means that less fuel needs to be consumed to produce the same amount of energy. These plants can be very small (one MW) or extremely large (750+ MW). The Bayside Power Project in Saint John, New Brunswick is a co-generation facility that produces power and steam. It is a 260 megawatt, natural gas-fired, combined-cycle power plant that began commercial operation in October 2001. Duke Energy North America owns a 75 percent interest in the facility. The additional 25 percent interest is owned by Irving Oil.

The Truro Industrial Park is conducting a co-generation feasibility study for generating locally electricity and steam heat for several different the manufacturing plants in the park. Co-generation has the potential to reduce total energy costs to a firm and is a stronger attractor/retention factor than electricity alone. The power generated from the facility can be used by local companies or included in the overall power supply for the province.

There is some interest among natural gas suppliers such as Irving Oil and Heritage Gas in Nova Scotia to partner in these co-generation facilities. In addition, the New Brunswick government is encouraging this type of power production as it is more environmentally friendly and is part of their strategy to promote competition in the supply of energy. However, NB Power does not have much interest in these types of smaller scale facilities.

## 9.3 A Gas-to-Liquids (GTL) plant

New technology is being developed and applied to convert natural gas to liquids in gas to liquids technology (GTL). GTL is a process for converting natural gas into synthetic oil, which can then be further processed into fuels and other hydrocarbon-based products. In the simplest of terms, the GTL process tears natural gas molecules apart and reassembles them into longer chain molecules, like those that comprise crude oil. However, with this particular conversion process, the result is an extremely pure, synthetic crude oil that is virtually free of contaminants such as sulfur, aromatics and metals. This synthetic crude can then be refined into products such as jet fuel, diesel fuel, naphtha, wax and other liquid petroleum or specialty products.

The projects are scalable, allowing design optimization and application to *smaller gas deposits*. The key influences on their competitiveness are the cost of capital, operating costs of the plant, feedstock costs, scale and ability to achieve high utilization rates in production. As a generalization however, GTL is not competitive against conventional oil production unless the gas has a low opportunity value and is not readily transported.

GTL is different from liquefied natural gas (LNG) which is the process of condensing natural gas for ease of transportation.

Conoco Inc. recently built a \$75 million demonstration plant at Ponca City, Oklahoma that provides ultra-clean-burning, sulfur-free synthetic fuels. The plant, in operation since 2002, converts natural gas into 400 barrels per day of sulfur-free diesel, jet fuel and other liquid fuel products.

Irving Oil is the largest distributor of jet fuel in eastern Canada and the northeastern USA. According to one source, they are continually being challenged by supply and cost issues. They may represent a potential target for a GTL plant in the area.

## **9.4 Major Industrial User**

Another potential anchor to the Sussex Energy Park could be a major industrial user that would require a significant percentage of McCully natural gas into the foreseeable future. As was shown in section 7 above, there are a number of industries that are considered major users of natural gas including: nitrogenous fertilizer plants, pulp mills, petroleum refineries, aluminum smelters and paperboard mills. However, the quantity of supply may be an issue for some very large users.

## **9.5 Local Natural Gas Utility**

Another option is the establishment of a local natural gas utility. This would be similar to the approach taken by the City of Medicine Hat where the municipality owns the rights to a significant portion of the natural gas reserves and sells natural gas directly to end users. However, the goal of the Sussex Energy Park is not to establish a 'local utility' that would service a broad group of business and residential users in the Sussex area. Rather it is to provide low cost natural gas to attract a select group of new businesses to the area to create jobs and economic opportunity. Given this mandate, a local utility most likely would not be an effective structure in a small, defined geographic area near gas.

## **10. Beyond McCully – The Potential of the Energy Sector**

### **10.1 Albert County Oil Shale Opportunities**

The rising price of oil and natural gas combined with growing supply concerns has driven significant new exploration interest across North America. This interest has extending into onshore Atlantic Canada. In addition to exploration activity in New Brunswick, PEI has recently issued a Call for Bids for oil and natural gas exploration rights in the province.

Albert County in southeastern New Brunswick has traditionally been a source of oil and gas. In fact, Albert County gas serviced the City of Moncton for many years early in the 20<sup>th</sup> century.

Now may be the opportune time to look at the state of extraction technology and investigate the financial feasibility of tapping the Albert County oil shale reserves. A recent report by the U.S. Geological Survey estimates that there are an estimated 269 billion equivalent barrels of oil shale in the Albert County deposits. A miniature version of the "Alberta tar sands project" may be feasible at this elevated oil price level. This could be another major economic development opportunity within the Enterprise Fundy region.

The New Brunswick government should consider its approach to encouraging the exploration and production of oil and gas to make the potential of extracting these natural resources more attractive to investors.

## Appendix A: Jurisdictional Review

**Community: Plattsburgh, New York**

**Relevant Links:** <http://www.parc-usa.com/>

**Overview:** PARC (the Plattsburgh Airbase Redevelopment Corp.) manages the development of the former Plattsburgh Air Force Base, a 5,000-acre facility located adjacent to Lake Champlain. Its assets include some of the finest aviation and multi-modal facilities in the United States. PARC is the catalyst behind the community's #3 ranking on Site Selection magazine's list of "America's Top 100 Small Towns for Corporate Facilities." Its assets include:



- a world class airfield,
- on-premises rail service,
- easy interstate access to Montreal, Boston and New York City,
- attractive financial incentives including Empire Zone and Foreign Trade Zone status
- a ready- made infrastructure equal to a small city,
- on-site fiber optic telecommunication services,
- diverse energy options and low utility rates, and
- available new and existing buildings and hundreds of acres of build-to-suit sites

Tenants include: Bombardier Inc., Composite Factory, Exelon Corp., GSM Vehicles Inc., Macro International Inc., The Northeast Group, Northern Parts & Service, PrimeLink, Pratt & Whitney, TransEd Assembly Plant, Westinghouse Stone Air, Wood Group Aero and Wyeth Pharmaceuticals Inc. Many of PARC's tenants are Canadian companies that wanted to have a physical presence in the U.S.

There is also a 240-megawatt natural gas-fueled cogeneration project in Plattsburgh. Saranac has an agreement to sell electricity to New York State Electric & Gas Corporation and steam to Georgia-Pacific Corporation and Tenneco Packaging, Inc. The project also sells natural gas transportation to New York State Electric & Gas Corporation and Georgia-Pacific Corporation through its wholly-owned North Country Gas Pipeline. Saranac is strategically connected, via the 22-mile North Country Gas Pipeline, to TransCanada's gas transportation network, providing access to some of the most inexpensive natural gas available in North America.

**Natural Gas Advantage:** PARC's Empire Zone status means that manufacturers that establish in the park are eligible for energy incentive rates. For a typical manufacturer, this could mean a reduction over standard industrial rates of up to 20% to 30% for a defined period of time.

**Conclusion:** The PARC has been an economic development success story. The City of Plattsburgh has a population of only 16,000 residents and the closure of the Airbase could have been a death blow for this small community. However, the combination of aggressive marketing, excellent infrastructure and a variety of incentives, including lower cost energy, helped the community attract hundreds of new jobs and many new business investments. Lower cost natural gas was one of the overall benefits of the value proposition put forward by PARC. However, natural gas rates in that region are not among the lowest in the U.S. – even with the incentive rates.

**Community: Medicine Hat, Alberta**

**Relevant Links:** <http://www.medicinehat.ca/cityservices/business/agencies.html>

**Overview:** Medicine Hat, Alberta has branded itself as the 'Gas City' to get some marketing mileage out of the huge natural gas reserves in and around the city. The City of Medicine Hat has its own natural gas utility and the rates charged are the lowest in Alberta. There is pressure on the City Council to raise its rates to achieve a higher return on its investment but costs will never go higher than alternative suppliers as the Municipality is not subject to specific taxes a private utility is.



Medicine Hat has a population of just over 61,000 residents. The community has been growing strongly up over 9% from 1996 to 2001.

The economic development department of the City has found that low cost gas has been a factor in attracting new industry to the community. However, they found that the city's other advantages were also equally beneficial including low tax rates, no business tax, productive work force, etc. The majority of industry in Medicine Hat that use gas for production (value add - Canadian Fertilizers, Cancarb, Methanex) are buying high pressure/high volume gas from large Alberta suppliers at large contract rates.

The community has recently completed an economic analysis and is focusing its efforts on four key areas for economic growth. 1) tourism & entertainment, 2) value added agriculture, 3) energy resources, and 4) metal fabrication and equipment.

Specific companies that have been attracted to the region, in part because of low cost gas, include: GoodYear Canada, Moduline, Wittke Waste Equipment (Federal Signal), Cancarb Limited (TransCanada Pipeline), Canadian Fertilizers and Red Hat Cooperatives Ltd.

**Natural Gas Advantage:** Medicine Hat has among the lowest cost natural gas for industrial and residential users in North America. The reason for the low cost gas include the size of the local supply, competition among suppliers and the limited cost of transportation of the gas. The City has its own natural gas utility but large users mostly get their gas from large private sector suppliers.

**Conclusion:** Medicine Hat is an excellent example of a community that is leveraging its local supply and the low cost of natural gas into a key differentiating factor in its economic development activities. It's very brand, The Gas City, denotes the importance of natural gas to the community. However, they have attracted some firms but still have a lower percentage of manufacturing jobs than many of their peer communities. Their relative distance from major urban markets may be part of the challenge for the community as well as Alberta's general inability to grow their manufacturing sector.

**Community: Burlington, Vermont**

**Relevant Links:** <http://www.medicinehat.ca/cityservices/business/agencies.html>

**Overview:** Burlington, Vermont is the state's largest city with just over 39,000 residents. It positions itself as having comparatively low-cost housing, labor, taxes and overhead. In January 1999, Point of View Magazine ranked Burlington 5th in "Boomtown, 75 cities to start a business" behind Seattle, Austin, Las Vegas and Denver. The greater Burlington area is Vermont's major economic center. Employers include IBM, Fletcher Allen Health Care, University of Vermont, Vermont Teddy Bear, General Dynamics Armament Systems, IDX Systems, Ben & Jerry's Homemade, Burton Snowboards, Blodgett Corporation and Brueggers Bagels. The area also supports many smaller manufacturing and service companies.



**Natural Gas Advantage:** Vermont Gas offers the lowest industrial rates for natural gas in New England and most of the U.S. eastern seaboard. There is no apparent reason for these low rates. There is no local supply of natural gas. It is brought in mostly from Alberta via Vermont Gas' Quebec-based parent company.

**Conclusion:** Burlington, Vermont is a good example of a community not trying to benefit from its low cost natural gas. There is limited information about this advantage in the community's marketing materials and discussions with officials indicate there are no major efforts underway to attract industries that would be large users of low cost natural gas. In addition, Vermont is not trying to build its manufacturing base. It's economic development activities are channeled elsewhere such as growing local businesses, tourism promotion and the IT sector. Burlington, Vermont is a good example of how low cost natural gas, by itself, will not lead to the attraction of new industry.

**Community:** **Guysborough, Nova Scotia**

**Relevant Links:** <http://www.gcrda.ns.ca/>

**Overview:** The Guysborough Municipal District in Nova Scotia is home to just over 5,000 residents. The county has under 10,000 total residents. The Goldboro Industrial Park was established in 1998. It is the landfall site for the Sable natural gas sub-sea pipeline and



home to the SOEI natural gas processing plant. The objective of the Goldboro Industrial Park was to leverage the Sable natural gas supply into a number of major economic development projects for the Guysborough region. For example, a feasibility study was completed on the potential of an aluminum smelter in the park but ruled out because even with the bypass rate, the natural gas would be too expensive.

**Natural Gas Advantage:** Unique to the park is the Goldboro Bypass Option which allows users of more than 530,000 mmcf of gas per day to bypass the toll on the natural gas. This savings is estimated to be worth \$0.70 CDN/mmBtu and an additional \$0.65 USD/mmBtu over a U.S. site.

**Conclusion:** Guysborough was selected to be included in this report because, on its face, the underlying premise with Guysborough was the same as with Sussex – can the local supply of natural gas to drive secondary economic development. Although it may be too early to tell, it seems that the strategy has not been successful. Some projects have shown interest but did not materialize. The usage rate in order to benefit from the incentive rate may be set too high and the supply of gas at that level is also in question.

In terms of marketing, it seems have not built a wider value proposition for the region. In addition, some basic marketing tools such as their web site do not seem to work. The website [www.gcrda.com](http://www.gcrda.com) (as listed in the provincial industrial park directory) is not active and a review of the Guysborough County Regional Development Authority also provides a dead link to the [www.gcrda.com](http://www.gcrda.com) domain name.

Guysborough is relatively isolated from any major urban area and the highway infrastructure to the main TransCanada highway is not high quality.

In short, this is an example that low cost natural gas does not make up for a weak overall value proposition.

**Community:** **Baglan Bay Energy Park**

**Relevant Links:** [www.baglan-energy-park.com/](http://www.baglan-energy-park.com/)

**Overview:**



In Europe, BP's Baglan Bay Chemicals site in Wales is being transformed in the world's first industrial energy park through a partnership between BP's chemicals and gas, power and renewables businesses and the local council and Welsh Development Agency. Working in a unique public/private sector partnership with Neath Port Talbot Council and the Welsh Development Agency, 1000 acres of the

chemicals manufacturing site are being re-developed to create the Baglan Energy Park. The Park's mission is to create quality jobs through the regeneration of Baglan Bay via a unique and energetic public/private sector partnership which aims to deliver 6000 new jobs on a brownfield site. This team has attracted some \$30 million of investment into the first two phases of the project, primarily from UK and European government sources. Crucially, the partnership has attracted GE to develop a power station at the heart of the Park. Baglan will now be the home of the world's first GE H system TM 500 MW combined cycle gas turbine power plant which will become GE's Global Technology Showcase. The power generated by the power station will provide cheaper electricity to attract inward investment from new companies' location on the Park as well as provide efficient and low emission energy to feed the BP Chemicals operations.

**Natural Gas Advantage:**

Baglan Energy Park offers among the lowest cost natural gas in the U.K. as well as low cost electricity from the GE power station which is located in the park.

**Conclusion:**

This is a large scale project, with significant government funding and high impact marketing activities. They have attracted a number of large scale projects and have ambitious goals. Also, the large scale private sector partner, BP, is an important advantage for the energy park.

## **Other Notable Initiatives**

### **Truro N.S. Industrial Park**

Closer to home, the Truro Industrial Park is conducting a co-generation feasibility study for generating locally electricity and steam heat for several of the manufacturing plants in the park. Co-generation has the potential to reduce total energy costs to a firm and is a stronger attractor/retention factor than electricity alone.

Our interviews confirmed that the co-generation project for the Truro Industrial Park is likely to proceed but will likely use Bunker C as natural gas based on the Sable Island pricing model is too expensive at the present time.

### **Slemon Park, PEI**

Slemon Park does not have access to natural gas. It is included in this document, however; because it is a good example of a small community in Atlantic Canada building a strong value proposition and using government financial support to attract a number of large firms to the community.

Slemon Park was established in 1991. Slemon Park is "Home of Prince Edward Island's Aerospace Industry". Slemon Park Corporation includes the following companies: Atlantic Turbines International Inc., Honeywell Engines and Systems, Testori Americas, Acro Helipro Global Services, MDS-PRAD Technologies Corporation, and Holland College's Aerospace & Industrial Technology Centre the training arm for the aerospace industry.

## Appendix B: Interviewee List

Norm Miller, President  
Corridor Resources Inc.

Ray Ritcey, President  
Heritage Gas

Rock Marois, General Manager (now with NB Power)  
Enbridge Gas New Brunswick

Keith Crush, Business Development Officer  
Business Support Office  
City of Medicine Hat, Alberta

Mark Gorley, Senior Policy Analyst  
Atlantic Canada Opportunities Agency

John Lawton  
New Brunswick Public Utilities Board

Jim Knight, Energy Analyst  
New Brunswick Department of Energy

Ron Philips  
New Brunswick Department of Natural Resources

Mr. Mel Whalen  
N.S. Power

Mr. Andrew Trenholm  
N.B. Power

Mr. Jim MacDonald  
Penggrowth

Doug Kirby , Former Industrial Promotion Officer  
Truro Economic Development  
Doug is spearheading a co-generation project for the  
Truro Industrial Park. He says that co-generation is  
likely to proceed but they will likely use Bunker C -  
natural gas is too expensive.

Rob Roy, Executive Director  
Pictou County RDA  
Rob has studies completed a while back on the  
feasibility of setting up a local distribution system.  
Project was not feasible.

Mark Bergeron  
Vermont Gas Systems, Inc.

Ed Antczak  
Economic Development Specialist  
City of Burlington Community and Economic  
Development Office

Bruce Steadman  
Plattsburgh Airbase Redevelopment Corp.  
Plattsburgh, New York

## Appendix C: Glossary of Terms

<b>Term:</b>	<b>Description:</b>
Associated Liquids:	Condensates (liquid hydrocarbons without free water) produced in conjunction with the production of gas to be transported or liquefiable hydrocarbons contained in such gas, but not including oil.
BCF:	One billion cubic feet, a unit of measure for natural gas.
BTU (British Thermal Unit):	A measure of energy, defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit under standard conditions. Natural gas is commonly measured in millions of BTUs, or MMBTU.
Bundling:	Combining or lumping several costs into one charge so as to not itemize the charges.
Bypass:	Obtaining service from a new supplier without utilizing the facility of the former supplier.
CCF:	One hundred cubic feet, a unit of measure for natural gas. One CCF is approximately equivalent to one therm, the unit of measurement for most gas metering and billing systems.
City Gate Rate:	The rate charged a distribution company by its supplier(s). It refers to the cost of the gas at the point at which the distribution utility takes title to the gas.
City Gate Station:	Point at which a distribution gas company receives gas from a pipeline company.
CNG:	Compressed natural gas.
Co-firing:	The process of burning natural gas in conjunction with another fuel.
Cogeneration:	The use of a single prime fuel source in a reciprocating engine or gas turbine to generate electrical and thermal energy in order to optimize the efficiency of the fuel used. The dominant demand for energy can be either electrical or thermal. Usually it is the latter with excess electrical energy, if any, being transmitted into the local power supply company's lines (with a reciprocal situation existing when electrical demands exceed the cogeneration plant's output).
Compressed Natural Gas (CNG):	Natural gas in high-pressure surface containers that is highly compressed (though not to the point of liquefaction). CNG is used extensively as a transportation fuel for automobiles, trucks and buses in some parts of Italy, New Zealand, and in Western Canada, and has recently begun to penetrate some regions of the United States. Small amounts of natural gas are also transported overland in high-pressure containers.
Consumption Charge:	The cost of the gas per therm. Most marketers combine the cost of the gas with the Transportation Charge, however some marketers do not bundle this charge with the rate.
Cubic Foot:	The most common unit of measurement of gas volume. It is the amount of gas required to fill a volume of one cubic foot under stated conditions of temperature, pressure, and water vapor.
Curtailment:	The act of reducing or stopping the supply of natural gas to customers who, in exchange for favorable terms, have agreed to an interruptible natural gas supply. Because of increased demand relative to supply, the cooler winter months are typically referred to as "curtailment season."
Dekatherm:	A unit of measure for heating value, equivalent to 10 therms, used to measure natural gas.
Distribution Company:	Gas Company which obtains the major portion of its gas operating revenues from the operation of a retail gas distribution system, and which operates no transmission system other than incidental connections within its own system or to the system of another company. A distribution company obtains at least 90 percent of its gas operating revenues from sales to ultimate customers, and classifies at least 90 percent of mains (other than service pipe) as distribution.
Exploratory Well:	A well drilled either in search of a new and as yet undiscovered accumulation of oil or gas, or in an attempt to significantly extend the limits of a known reservoir.

<b>Term:</b>	<b>Description:</b>
Extraction Plant:	A plant in which products, such as propane, butane, oil, ethane, or natural gasoline, which are initially components of the gas stream, are extracted or removed for sale.
Firm / Interruptible Natural Gas Services:	Natural gas services – which include sale, transportation, and storage of natural gas – are either firm or interruptible. A firm service is one which cannot be interrupted, except in extraordinary circumstances, whereas an interruptible service may in fact be discontinued for a variety of reasons. Residential natural gas service is, by federal law, always firm, and cannot be interrupted except under a set of extremely narrowly defined circumstances.
FRAC:	Industry term used to refer to the method used to increase the deliverability of a production or underground storage well by pumping a liquid or other substance into a well under pressure to crack (fracture) and prop open the gas-bearing formation.
Fractionation:	Process whereby saturated hydrocarbons from natural gas are separated into distinct parts of propane, butane, ethane, etc.
Gathering Line:	A pipeline, usually of small diameter, used in gathering gas from the field to a central point.
Gathering Station:	A compressor station at which gas is gathered from wells by means of suction because pressure is not sufficient to produce the desired rate of flow into a transmission or distribution system.
Gathering System:	The gathering pipelines plus any pumps, tanks, or additional equipment used to move oil or gas from the wellhead to the main pipeline for delivery to a processing facility or consumer.
Lateral:	A pipe in a gas distribution or transmission system which branches away from the central and primary part of the system.
Liquefied Natural Gas (LNG):	Natural gas which has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure. It remains a liquid at -116 degrees Fahrenheit and 673 psig. In volume, it occupies 1/600 of that of the vapor at standard conditions.
Load Balancing:	The process of matching customers' demand for gas with producers' ability to supply. Gas companies balance load by adjusting volumes taken from suppliers, by utilizing storage, and by adding or shedding interruptible customers.
Marketer:	The company who owns the natural gas that they sell to you for use in your home or business. Since the marketer is selling you your natural gas, they are also responsible for providing customer service and your bill. Another term for "marketer" is "provider".
MCF:	One thousand cubic feet, a unit of measure for natural gas.
Meter Reading:	A regulated assessment that covers the cost of reading the meter and calculating the usage for reporting to the marketer and the customer.
MMCF:	One million cubic feet, a unit of measure for natural gas.
Pipeline Quality Gas:	A term used to designate a fuel gas compatible with natural gas from pipelines. Such a gas can be substituted for methane. With respect to synthetic pipeline gas, a gas that meets the specifications for methane interchangeability.
Provider:	Another term for marketer.
TCF:	One trillion cubic feet, a unit of measure for natural gas.
Therm:	The smallest and most common measurement of gas volume that flows through a meter.
Wellhead Price:	The cost of gas as it comes from the well excluding cleaning, compression, transportation, and distribution charges.