

An Overview of the Wood Pellet Industry: “A British Columbia Perspective”

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1.0 Executive Summary

The following is an overview of the wood pellet industry. It will examine key aspects of the industry, both positive and negative. The report starts with an overview of the current energy consumption levels looking at the different sources of energy, and what role renewable energy plays. The several types of renewable energy are discussed and biomass energy is then defined. Wood pellets are labeled as a specific type of biomass energy, and the report moves to further explain wood pellets in full.

An introduction to what wood pellets are, is presented beginning with a brief description of the products' properties. The North American standards for wood pellets are explained moving to a full description of the production process.

The report then looks at two major markets for wood pellets. The potential for the U.S. market is examined starting with the residential heating sector and the role pellet stoves plays there. The potential for the industrial energy sector is then reviewed, specifically the potential for using wood pellets with coal to create energy.

The second major market looked at is the European Union. Factors contributing to the success of pellets in the European market are explained as well as production potential, and the significance to the Canadian pellet industry.

The Canadian wood pellet industry is further examined, and the report specifically looks at the industry in British Columbia. Current economic conditions in BC's forest industry are discussed and specific examples are given of how wood pellets are changing the industry. Potential barriers to the success of the pellet industry in Canada and BC are brought to attention, and the report is then closed with concluding remarks.

2.0 Introduction

2.1 Energy Industry

World energy consumption has been projected to increase by 50% from 2005-2030 (International Energy Outlook, 2008). This will be due to the economic expansion and population growth of the world's developing countries. As world energy consumption continues to increase, developed countries are becoming increasingly concerned with using less expensive and more environmentally friendly energy sources.

All energy sources will see continued usage increases overtime. However, with world oil prices remaining at relatively high levels, liquid fuels will be the slowest growing source of energy. Liquid fuels can be defined as energy-generating or combustible molecules that are used to create mechanical energy. Liquid fuels such as natural gas or oil are derived from fossil fuels. The slow growth of liquid fuels will also be due to the fact that developed nations, particularly in the European Union, are looking at lowering their greenhouse gas emissions in accordance with Kyoto Protocol regulations. Liquid fuel consumption is expected to increase at an average rate of 1.2% per year for the next 20 years where as coal and renewable energy will be increasing by 2% and 2.1% respectively (International Energy Outlook, 2008). The cost of coal is relatively low when compared to that of liquid fuels, and its large quantities in high energy consuming countries (US, China, India) make it an economical source of energy. Still, both coal and liquid energy sources produce high greenhouse gas emissions making renewable energy an attractive alternative.

2.2 Renewable Energy

The popularity of renewable energy is growing substantially due to a more environmentally conscious developed world. Developed countries now have the knowledge and resources to look at implementing more efficient energy technologies that produce lower emissions at a lower cost. Public awareness has also contributed to the popularity of renewable energy. Today, citizens of developed nations are more informed on the effects consumption of fossil fuels is having on climate change and they are

becoming more and more concerned with using environmentally friendly energy sources. Energy companies are seeing this rise in popularity, and are now looking to cash in on a growing industry.

Renewable energy is derived from natural resources which include wind, geothermal heat, sunlight, water, and biomass. 18% of total global energy consumption comes from renewable energy (REN21, 2008). This is dispersed throughout the different forms of renewable energy. Modern technologies such as wind power, geothermal energy, solar power, and ocean energy make up less than 1% of the total global consumption of energy. The second largest form of renewable energy is hydroelectricity which makes up 3% of total global energy consumption (REN21, 2008). Biomass energy makes up by far the largest portion of renewable energy consumed in the world at 13% of the total global consumption (REN21, 2008). This 13% is largely made up of traditional biomass energy such as burning wood.

2.3 Biomass Energy

The term Biomass refers to any form of animal or plant tissue (Re-energy.ca, 2007). In the energy industry biomass energy (bioenergy) refers to solar energy stored in organic materials such as vegetable oils, wood, straw, and forest/agricultural/industrial wastes. Biomass fuels (bio-fuels) differ from fossil fuels in that they do not take thousands of years to be converted into a usable resource. Bio-fuels can be used in an ongoing renewable fashion. They are used in solid (wood chips, sawdust, pellets, etc), liquid (pulping liquors, ethanol), or gaseous (methane) forms.

The use of solid wood biomass has seen massive increases in both the residential and industrial energy sectors. This has been evident in both the European Union countries, and North America. An example of this can be seen in the massive increases in both the production and usage of wood pellets world wide.

The wood pellet industry is rapidly expanding with plants being constructed in wood residue rich countries such as Canada. There have been several plant start-ups across

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Canada with the bulk of production coming from British Columbia. BC has extremely high pellet production potential and has taken steps towards utilizing that potential. The following report will look to define wood pellets, and discuss the current/potential markets for the product, the products roll in BC and the possible barriers that the industry could face.

3.0 Introduction to Wood pellets

3.1 Properties

Wood Pellets are a manufactured fuel source derived from wood waste materials including sawdust, wood chips, and bark. The wood waste material is collected from sawmills, and other wood processing industries. The woody materials are ground into sawdust and produced into small pellets. Chemical additives are not needed to hold the waste particles together as the lignin in the wood acts as a binder. However, sometimes maize starch is used to increase particle binding. Pellets have consistent size being 6-12mm in diameter and 24-48mm in length (CSBE, July 2006).

Wood pellets are a very dense material, with low humidity content which allows them to burn with high combustion efficiency (Wikipedia, 2009). It has been found that wood pellets have a significant advantage over fossil fuels in that they reduce the emissions of greenhouse gases by 30% (Menzies, Nov.2008). As well as producing lower emissions than fossil fuels, wood pellets are an attractive fuel source due to their lower volume in terms of transportation and storing purposes. Higher volumes of the product can be transported due to their small size, allowing for fewer deliveries.

Pellets can be burned as fuel in both large industrial power plants and in residential homes. In North America alone there are over 600,000 residences using wood pellets to heat their homes (CSBE, July 2006). In an industrial situation, wood pellets are useful because they are made up of small particles and can be crushed and burned in pulverized fuel burners like coal powder.

3.2 Standards

There has been some progression towards developing a standard for wood pellets by the Pellet Fuels Institute (PFI). The PFI has developed four grades of pellets: utility,

standard premium, and super premium. The differentiation between the grades lies within the ash content the pellets emit when burned. Utility grade pellets have ash content of 6% where as standard grade should be at 2% (Lisle, 2008). Premium grade pellets are set at 1% and Super Premium grade are at 0.5% (Lisle, 2008). The ash content is reduced in premium grade pellets by eliminating wood bark from the production process of the pellets. All of the grades are defined by five fuel characteristics, listed below:

1. Bulk density per cubic foot (0.028 cubic meters) shall not be less than 40 pounds (18 kg)
2. The diameter shall be 1/4 to 5/16 inch (635-794 mm)
3. Maximum length shall be 1 and 1/2 inches (254-127 mm)
4. Fines (dust) of not more than 0.5% by weight shall pass through a 1/8 inch (317.5 mm) screen
5. Sodium content shall be less than 300 parts per million (ppm).

*(U.S. Department of Energy, 2008).

The above standards are recognized in the US and Canada, but are not strictly enforced. There are standards being set in Europe, but the standards vary from country to country. This poses significant pricing and quality issues on a global scale as the bulk of North American production is exported to Europe.

3.3 Production Process

The production process of a wood pellet plant involves 5 different stages: drying, milling, pressing, cooling, and screening. Drying costs of the wood waste materials used in the production process are increased due to the 50-65% moisture content of the green wood chips coming into the plant (CSBE, July 2006). The chips are dried to 7-8% moisture content (CSBE, July 2006). The low level of moisture helps the lignin act as a better binding agent. The drying stage is the most important of the process as it reduces machine wear on the rollers and presses.

At the milling stage the raw material is turned into sawdust typically using a hammer mill. This is done to produce uniform material for pellet production. An electric motor powers the hammer mill, and the energy is converted to heat to help further dry the material. The material is then conveyed past a magnet which removes metal materials before it is sent to the pressing stage.

At the pressing stage the sawdust is conveyed into a pelletizing cavity where die rotation and roller pressure force the material through small cavities, compressing the material into pellets. The pellets are compressed through dry steam conditioning, and are cut to length using adjustable knives.

As the pellets come through the mill they are at a temperature of about 100°C (CSBE, July 2006). They must be cooled to roughly 25°C in order to properly harden and stabilize to maintain quality during handling and storage. Once the pellets have been cooled they are passed over a vibrating screen. This process removes any fine particulate from the pellets, and sends the fine particulate back into the production line. The pellets can then be stored in silos, or bagged for transport.

The production process for wood pellets is straightforward, and relatively simple. This helps keep production costs down and emissions low. Lower emissions when compared to the use of fossil fuels combined with the fact that wood pellets are a renewable fuel resource has made wood pellets a very attractive alternative to generate both energy in industry and heat for residential buildings.

4.0 Markets Overview

4.1 U.S. Wood Pellet Market

4.1.1 Pellet stoves

The US wood pellet market has been primarily based on residential heating using pellet stoves. As mentioned earlier, there more than 600,000 wood pellets stove users in North America the bulk of which are located in the US with numbers growing consistently (CSBE, July 2006). However the initial investment for converting to a wood pellet stove is \$3000.00 with a 1.5 year return on investment (Holmberg, 2008). The US has not ratified the Kyoto Protocol so there is far less concern with lowering greenhouse gas emissions across the country. With the current state of the US economy and lack of GHG reduction support from the US government there is less incentive for people to convert their heating systems to wood pellets.

For the time being the main driver to the success of the pellet stove market in the US will have to be the lower relative cost to that of oil fuel heating systems. The cost of heating a home with wood pellets is about 43% lower than it is to heat a home using oil fuels (Holmberg, 2008). It should also be noted that although the US has not committed to reducing its emissions, the fact that wood pellets are a more environmentally friendly heating fuel is also very marketable. Even in the US, if people can get a cheaper fuel source that is also helping the environment they will definitely jump on board.

4.1.2 Coal fired energy plant opportunities

Coal is by far the largest fossil fuel energy source in the US today with large volumes of resources located directly in the states. However, coal prices are at all time highs and are expected to continue rising by more than 50% each year for the foreseeable future (Christiansen, 2008). With this in mind US energy companies are looking for ways to reduce their input costs.

It has been found that wood pellets are a legitimate alternative to burning coal with a GHG emissions reduction of around 30% (Menzies, Nov.2008). This has caused US companies to consider the option of converting their energy plants to burn wood pellets instead of coal. For example, Xcel Energy has committed between \$55 and \$70 million in converting its coal-fired Bay Front plant in Aschland, Wisconsin to a wood biomass system (Christiansen, 2008). The capital investment on a conversion such as this is very high, but with increasing coal prices and a growing concern for the environment many companies will consider it a necessary expense for long term success.

One key issue coal holds over wood pellets is the fact that its energy output is far superior. Pellets can produce from 5,300 to 6,400 British Thermal units (Btus) per pound of material where as coal can generate anywhere from 7,000 to 12,500 Btus per pound (Christiansen, 2008). Although coal produces higher greenhouse gas emissions it does yield higher energy outputs. This causes a bit of a trade off when converting to wood pellets (losing energy output to reduced costs and reduced GHG emissions).

To counteract the trade off that occurs when converting from coal to wood pellets many coal-fired power plants use the two together. This is referred to as co-firing. It has been tested that co-firing a mix consisting of 10% wood pellets and 90% coal can reduce emissions by as much as 9% (Indeck Energy Services Inc., 2008). Co-firing is a legitimate way for the wood pellet industry to gain a foot in the door of the US industrial energy sector. Attempting to co-exist with coal rather than overtake it may prove to be the best option for the pellet industry. Maintaining energy output levels as well as reducing cost and emissions can only benefit both industries. This will increase the market share of US energy industry for both coal and wood pellets.

4.2 European Market

4.2.1 Current market

The ratification of the Kyoto Protocol has led to European Union (EU) countries looking for new ways to reduce their greenhouse gas emissions. Wood pellets produce significant benefits in emissions reduction. This has caused a rapid expansion of the wood pellet market in Europe with many of its EU countries meeting much of their energy needs by burning wood pellets. In 2008, Sweden satisfied 25% of its energy consumption using biomass energy, a large portion of this coming from wood pellets (Menzies, Nov 2008). In fact, 1,400,000 tons of wood pellets were consumed by Sweden in 2007 (Wikipedia, 2009). The total wood pellet production capacity of Europe was estimated at 9 million tons in 2007 (Egger and Oehlinger, 2008). Also the consumption of wood pellets was estimated at 8.5 million in 2008, and is expected to reach 13 million tons by 2010 (Wright 2008). Below is a graph that shows European pellet production, import, and consumption levels.

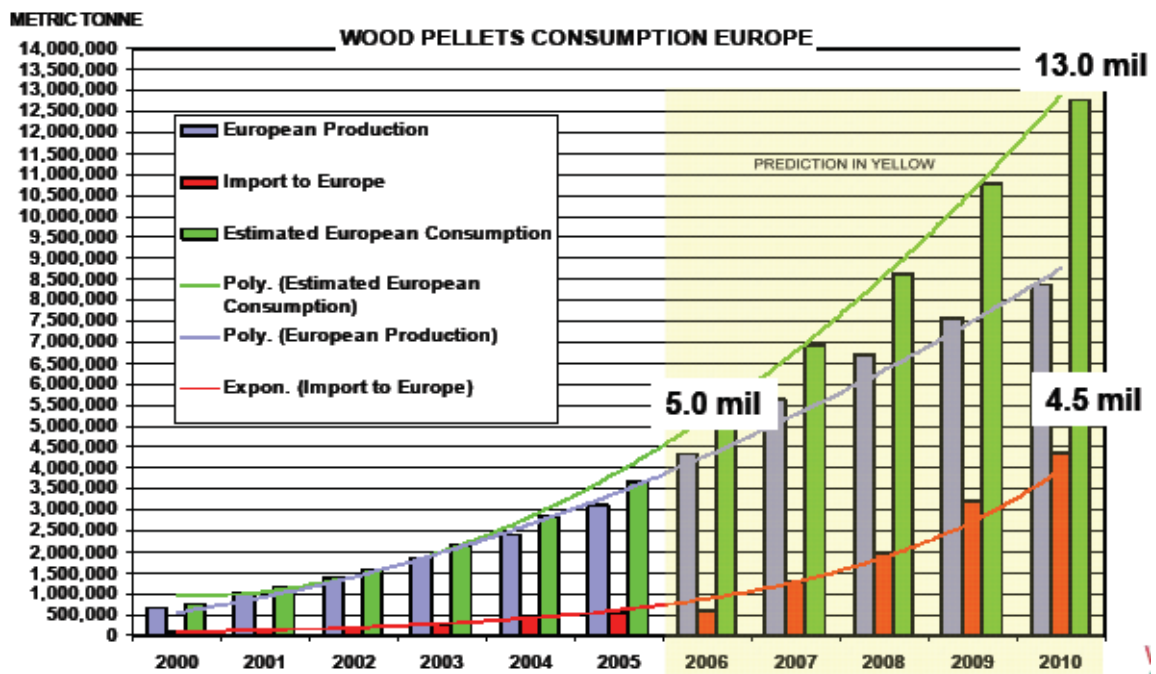


Figure 1 - European pellet consumption (Wright, 2008).

The rapid expansion of European marketplace for pellets has spurred interest from many large international corporations. For example, Mitsubishi Corp. has invested a reported \$8.2 million for 45% ownership of a pellet manufacturer located in Bremen, Germany (Christiansen, 2008). The company purchased is known as Vis Nova Trading, and will be increasing its production levels to 500,000 tons for 2010 (Christiansen, 2008).

4.2.2 Europe's affect on Canada

EU market demand has been the biggest driver for production expansion in Canada, specifically in British Columbia. Canada exported a total of 1.3 million tons of wood pellets in 2007, with 600,000 of those tons being exported to Europe (Wood Resources International, June 2008). The main percentage of the pellets was produced in BC pellet plants. There is seemingly unlimited production potential in British Columbia, and there are a lot of companies looking to tap into the expanding market.

The explosion of the European pellet market should not prevent companies from looking at the potential issues that could come into play in the near future. The industry is expected to see continued growth over the next 3-5 years (Wood Resources International, June 2008). A serious question that should be asked is how long can the demand for pellets in the EU exceed the costs of transporting them? Pellets leaving Prince Rupert, BC bound for Europe must take a 15,000km journey by ship (Wood Resources International, June 2008). The fuel costs for this journey are very high, and if European demand decreases how are Canadian pellet companies going to keep their profit margins? Another point that should be made is that in order for this "green" product to be delivered to Europe, ships are burning massive quantities of low-refined heavy fuel oils. There are several market supply and transportation issues that need to be considered to determine if the pellet industry will be sustainable.

5.0 Wood Pellets in BC

5.1 Wood Pellets in Canada

The collapse of the US housing market, rising oil prices, and high energy costs has led to many Canadian companies, communities, and entrepreneurs exploring the potential of investing in bio-energy projects. The wood pellet industry has been a hotbed of activity in recent years with plants being constructed in British Columbia, Ontario, Quebec, and the Maritime provinces. There are at least 11 pellet plants in Canada, almost half of them located in BC (Bradley, 2006). Wood pellet plants in British Columbia and the Maritimes mainly export their product to Europe due to their coastal port access where as companies in Ontario and Quebec mainly exports the product to the US. On the next page is a table that shows 11 Canadian pellet companies, their capacity, production and export levels, and their key market. Also on the next page is a graph showing pellet production in Western Canada up to 2006. It displays the rapid expansion of the industry's production levels, and overseas sales.

Pellet Production (000 tonnes pa)

Manufacturer		Capacity	Production	Exports	Key Market
Pellet Flame Inc	BC	100	60		Europe
Pinnacle Pellet	BC				Europe
Premium Pellet	BC	200	120	108	Europe
Princeton Co-Generation Corp	BC	75	60	6	Europe
expansion May 2005			30		
Amstrong	BC	50	50		Europe
Pacific Bioenergy Corp	BC	140	130	124	Europe
Dansons-Vanderwell	Alberta	80	40	32	US
Energex	Quebec				
Advanced Wood	New Brunswick	10	10		US
Shaw Resources	New Brunswick	20	20		
Mactara	Nova Scotia	80	80	80	Europe
Total		755	600	350	

Figure 2 - Canadian Pellet Production (Bradley, 2006).

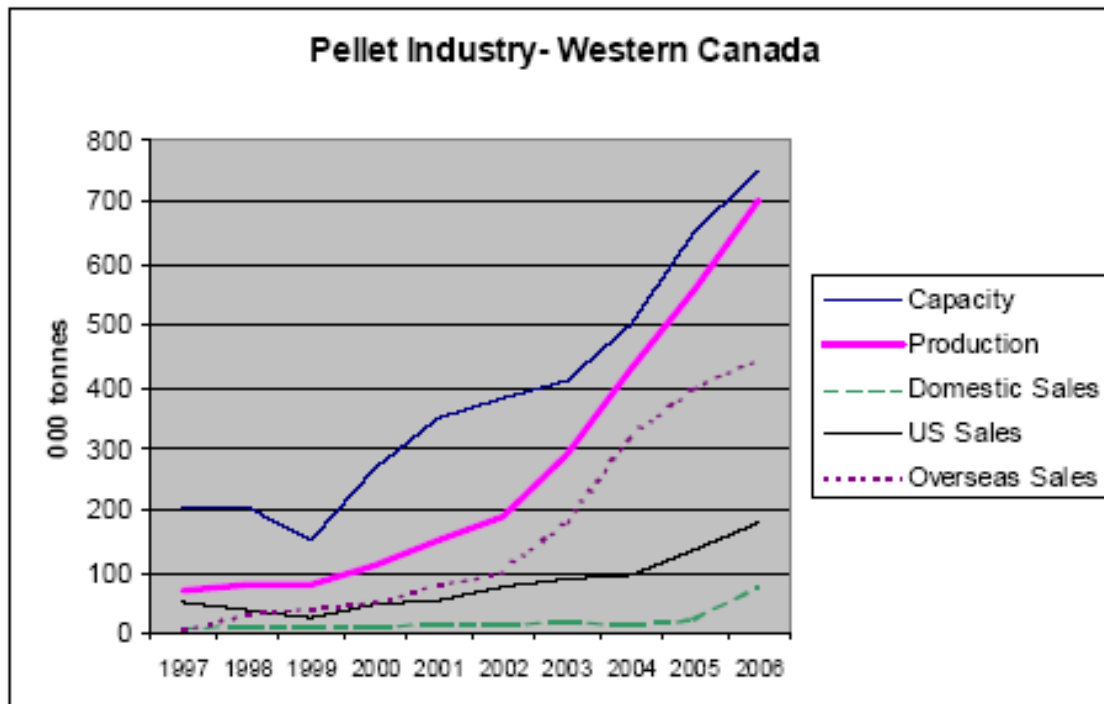


Figure 3 - Western Canadian Increases (Bradley, 2006).

5.2 State of BC's forest industry

The British Columbia forest industry has been hit extremely hard by the economic crisis that has hit the United States. US housing start-ups dropped from 1.5 million in February 2007 to just below 500,000 in January 2009 (Forecast, 2009) (Figure 4). This has led to many sawmill closures throughout BC. At least 34 mills have been shutdown indefinitely or permanently with approximately 10,000 forest sector workers losing their jobs (Hamilton, Feb 29 2008).

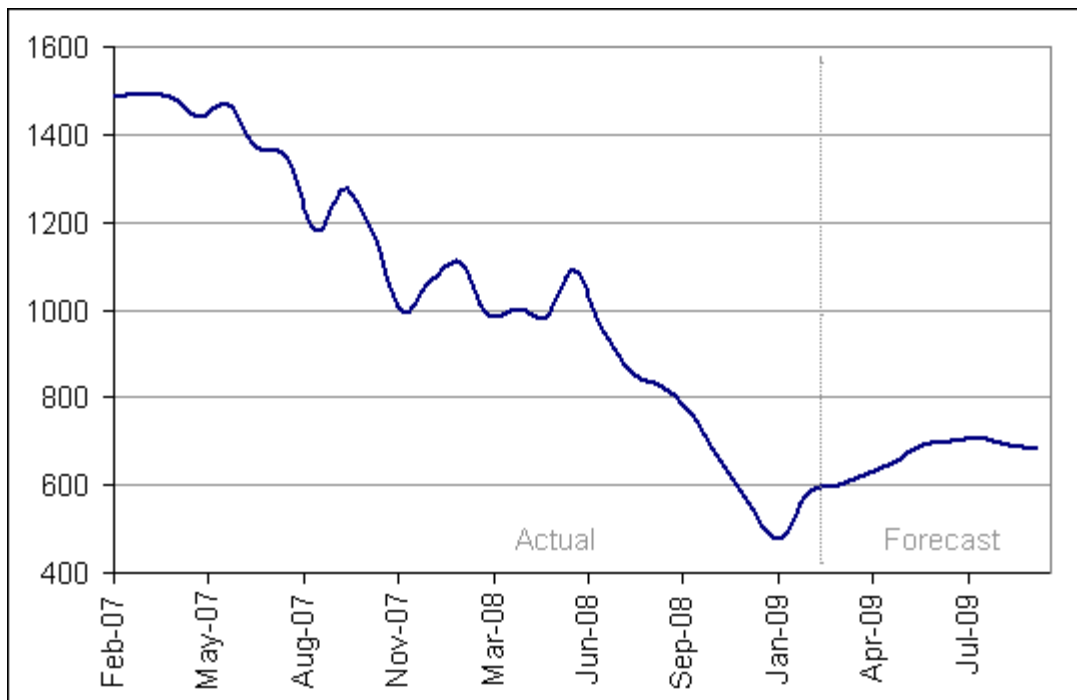


Figure 4 - US Housing Starts (Forecast 2009).

The shutdown of so many sawmills in BC has also affected the logging industry. Countless numbers of contract loggers have been forced into bankruptcy or simply put out of work due to the lack of demand for dimensional lumber in the US. Large forestry companies have been tightening up harvesting levels because of the low demand. International Forest Products Limited (Interfor) had only 3 contract logging operations active on the BC coast during late march 2009. Companies are operating in survival mode and are looking for ways to make any kind of profit in order to stay afloat in a looming industry.

5.3 Market for Pellets

The wood pellet industry has exploded in Europe, and US should soon follow. This has spurred the construction of several pellet plants in BC with more to come. An increased number of pellet plants in BC have caused increased demand for wood waste materials, which has also provided some opportunities for struggling logging contractors. There is an opportunity to harvest wood waste materials off of the cut blocks which is usually burned. Also, the Mountain Pine Beetle epidemic has left 27 million Bdt (bone dry tones) of unutilized biomass fibre. Harvesting this wood source will provide several jobs for contract loggers, as well as fuel many new pellet plants, providing jobs for laid off BC mill workers.

In the past, wood pellets have been produced as a byproduct of sawmill waste. The fact that there are several mills shutting down all over B.C. has contributed to an increasing need for wood waste supply from other areas of the forestry industry. With increased demand, the industry has seen its supply chain broaden to include both round wood, and logging site waste. In BC recently, there has been a lot of activity in both the harvesting of logging site waste, and round wood. Examples of both situations are further discussed below.

5.4 Contract Logging Harvest Potential

Pine Star Logging, a logging contractor located in Prince George, has recently begun harvesting the wood waste left behind from their logging activities. The waste is being sent to a pellet plant near Prince George which is owned by Pacific Bioenergy. Pine Star purchased a wood grinding machine which cost \$750,000.00 so that they would be able to grind their wood residues into sawdust for the pellet plant (Hoekstra, December 2008). The grinding site is located near Norman Lake, just west of Pacific Bioenergy's plant. Pine Star's grinding machine is fed by wood waste collected from the company's logged cut blocks. The wood waste harvested is comprised of defect ridden and shattered logs, branches, and any other wood debris left in the cut block. The grinding machine is easily transportable and can be taken to any location Pine Star happens to be logging at. Being able to have their production close to their supply reduces transportation costs. The entire

wood waste grinding operation employs 10 workers from the Prince George area. This is significant, as the shutdowns of many mills in the area have left many workers unemployed. George Stedeford, manager of commercial operations for Pacific BioEnergy, is praising harvesting the wood waste for pellets as environmentally friendly. Logging wood waste is usually stacked and burned at the cut block area. Harvesting the waste for pellets eliminates the amount of particulate released into the air, which increases the quality of the air in the Prince George area (Hoekstra, December 2008). The waste grinding operation has become a profitable enterprise for Pine Star Logging. This is helping them weather the extremely tough industry conditions.

Adding the grinding operation to their company is helping Pine Star Logging remain in business. However, there are many issues to look at before announcing the harvesting of logging site wastes as the solution to the woes of BC's contract loggers. This first issue is the large investment that is required to start-up such an operation. \$750,000 for most logging outfits in today's industry would be out of the question. Secondly, there is not enough steady work for logging companies to keep a consistent supply of wood waste. With increasingly low demand for BC produced dimension lumber in the United States, work contracts are becoming scarce. If a contract logging company invested a large sum of money into a wood waste grinding operation, and then not have the waste supply to keep the operation running, the company could find itself in serious financial trouble.

5.5 Mountain Pine Beetle Killed Wood

The logging of round wood specifically for pellet production is becoming an alternative to the wood waste supply/mill shutdown issue. The mountain pine beetle (MPB) epidemic in BC is now being looked at as an opportunity for pellet production. Talloil Canada Inc. is a pellet producing company that has attained 4 timber licenses with a total harvest volume of 1 million cubic meters/year (Menzies, November 2008). The company has plans to start-up 4 pellet production plants that will be designed to convert whole logs into wood pellets. These operations will provide jobs for more than 600 workers with a total investment of \$160 million (Menzies, November 2008). Talloil will be logging primarily MPB killed wood, which will help the BC in several ways.

Mountain pine beetle killed wood is an extreme fire hazard, and harvesting it will reduce the threat of forest fires in BC's interior greatly. As well, forests damaged by fire can be used for pellet production allowing for efficient reforestation. It costs the British Columbia government anywhere from \$5,000 to \$10,000 per hectare to rehabilitate Beetle affected forests (Menziess, 2008). Harvesting MPB affected wood will not only provide jobs and pump money back into the economy, but it will also reduce government reforestation costs.

The large capital investment like the one Talloil is planning is feasible for such a large company. However, a possible issue that could arise in the future will be sustaining the operation when the MPB killed wood has been totally consumed. Four pellet plants will require a large steady flow of raw materials. Once the MPB supply has run out will Talloil be able to operate solely on forest fire affected wood? There are a reported 27 million Bdt's (Bone Dry Tons) of unharvested wood that could last for 12-15 years, but what will happen to their 600 workers if Talloil cannot secure a certain level of raw material supply for the 4 plants?

6.0 Barriers to Increased Production and Trade

There are several barriers that exist that could inhibit the growth of the wood pellet industry. Some of these issues have been mentioned throughout this report, but will be highlighted in this section.

One potential barrier is the level of awareness of wood pellets as an energy alternative. Aside from energy and forestry companies the general population is largely unaware of wood pellets as an option for power, or heating. A large number of the populace who know about wood pellets is still unaware of the potential cost savings and emission reductions. It should be a major goal for wood pellet companies to market their product as an inexpensive, environmentally friendly product.

A lack of finances for capital investment is another potential barrier to the success of the industry (Bradley, 2006). With the current state of the US and Canadian economies energy companies may find it difficult to bankroll large conversion operations from fossil fuels to wood pellets. The state of the economy has also hit residential homes who may find a \$3000.00 conversion to a wood pellet heating system unattractive for their current financial situation.

With such intense demand for wood pellets the availability and cost of the product could become an issue. Pellets are made from wood waste which has previously been hauled away from mill sites at no charge. As demand increases prices will certainly increase making it less economical to use pellets. Also, with the shutdown of many sawmills the supply of wood waste for pellet production might not be sustainable.

Undeveloped supply chains for wood waste pose a large issue for the pellet industry. Harvesting wood residues directly from the forest floor are at the developing stage, and there are currently issues with finding cost-effective supply chain methods (Bradley, 2006).

Markets for wood pellets exist in Canada, but they are very small. An increase of a domestic market for pellets would help stabilize the industry in case of a decrease in export demands.

Misinformation by non-government organizations (NGOs) has posed as a barrier to the pellet industry. NGOs in the past have not been supportive of bioenergy activities because of longstanding beliefs that biomass energy produce harsh emissions. The Greater Vancouver Regional District, for example, doesn't allow the use of biomass products unless their emissions are less than natural gas emissions (Bradley, 2006). This is without taking into account greenhouse gas emissions, which is not accurate.

Another barrier to increased trade is the fact that there is no universal standard for wood pellets. The Pellet Fuels Institute is attempting to develop North American standards, but they differ from the European standards. The BC Pellet Fuel Manufacturers Association is attempting to create a standard that is based on the Swedish, Austrian, and other European standards which are BC's primary market. A universal standard for the industry wood make trade between countries much more efficient.

Competition in the European market could be a potential barrier. A country with a closer proximity to Europe could sell wood pellets at a lower cost because of lower transportation costs. Russia, for example, has an unlimited timber supply, and cheaper labor. Couple that with the fact that Russia is right next door to Europe, and you get a lower cost product, with faster delivery times.

Lastly, transportation costs may prove to be a large barrier for trade. The high demand for pellets is currently outweighing the cost of transporting wood pellets to Europe. If demand decreases and the price of wood pellets lower, the shipping costs to export wood pellets to Europe could become too high to sustain.

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Wood pellet industry is a thriving industry that still has many barriers inhibiting its expansion and trade. All the barriers discussed need to be taken into account in order for the wood pellet industry to continue success, and expand their markets.

7.0 Conclusion

With world energy consumption levels on the rise, and the growing importance of environmentally friendly energy sources in developed countries today, one cannot overlook wood biomass energy as a viable option. The current global trend of reducing emissions and the EU's progression towards falling in line with Kyoto Protocol regulations is causing rapid growth in the wood pellet industry. Many companies worldwide are looking to get a foot in the door of a highly profitable industry. Production levels in Canada are on the rise, and the bulk of production is going to Europe. There is serious potential for advancements in the US in both the industrial energy sector, and the residential heating sector.

Wood Pellets are a legitimate alternative to using coal. However, co-firing pellets with coal have been found to be a much more efficient way to both reduce emissions and costs, while maintaining levels of energy output.

BC's contract loggers are harvesting the wood waste as a secondary source of income in order to weather the worst industry conditions to date. MPB killed wood is also being harvested for pellet production. In the future, both of these wood waste supply options could see transportation, and demand issues, and have some risk to face moving forward.

For now, the wood pellet industry has shown it can be a profitable business for British Columbian companies. If European demand falls, and shipping costs become too excessive how will these companies sustain such high production levels? Maybe it is time for BC companies to look towards building a domestic market before it's too late.

8.0 References

- (Bradley, 2006). Canada Biomass-Bioenergy Report. [Internet] May 31, 2006. Available at: <http://bioenergytrade.org/plaintext/downloads/canadacountryreportmay312006.pdf> [Accessed April 7, 2009].
- (Canadian Encyclopedia 2009). The Canadian Encyclopedia, Historica Foundation of Canada. [Internet] 2009. Available at: <http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1SEC816934> [Accessed April 10, 2009]
- (Christiansen, 2008). The Next Hot Commodity?, Biomass Magazine. [Internet] December 1, 2008. Available at: <http://www.globalgreensolutionsinc.com/s/RelatedArticles.asp?ReportID=335028& Type=Related-Articles& Title=The-Next-Hot-Commodity> [Accessed February 11, 2009].
- (CSBE, July 2006). Economics of Pellet Production for Export Market. [Internet] July 16 2006. Available at: <http://www.bioeng.ca/Events/Edm2006/PDFs/CSBE06103.pdf> [Accessed April 7, 2009].
- (Egger and Oehlinger, 2008). Burning Issues: An Update on the Wood Pellet Market. [Internet] April 7, 2009. Accessed at: <http://www.renewableenergyworld.com/rea/news/article/2009/03/burning-issues-an-update-on-the-wood-pellet-market> [Accessed April 11, 2009]
- (Forecasts, 2009). The Financial Forecast Center. [Internet] January 1, 2009. Available at: <http://forecasts.org/house.htm> [Accessed April 8, 2009]
- (Hamilton, Feb 29, 2008). B.C. sawmill closures throw 10,000 out of work, The Vancouver Sun. [internet] 2008. Available at: <http://www.canada.com/vancouversun/news/story.html?k=66361&id=ccfb3fd4-af04-40dd-9a2d-c1ec84f99d90> [Accessed April 8, 2009]
- (Hoekstra, December 2008). Citizen Staff, Friday, 2008. Local logging company cashes in on wood waste. *Prince George Citizen*, [internet] December 5, 2008. Available at: <http://www.princegeorgecitizen.com/20081205164778/local/news/local-logging-company-cashes-in-on-wood-waste.html> [Accessed February 11, 2009].

(Holmberg, 2008). An Outlook of Renewable Energy and Pellet Fuel Industries. [Internet] August 21, 2008. Available at: <http://www.pelletheat.org/3/institute/2008summerConf/BillHolmberg.pdf> [Accessed April 10, 2009]

(Indeck Energy Services Inc., 2008). Wisconsin Wood Pellets: clean renewable energy for generations. [Internet] 2008. Available at: http://www.indeckenergy.com/images/BUS_DEV_WOOD_pellet.pdf [Accessed February 12, 2009].

(International Energy Outlook, 2008). Energy Information Administration: Official Energy Statistics from the U.S. Government. [Internet] 2008. Available at: <http://www.eia.doe.gov/oiaf/ieo/world.html> [Accessed April 8, 2009]

(Lisle, 2008). 2008 PFI Annual Conference. [Internet] 2008. Available at: <http://www.pelletheat.org/3/institute/2008summerConf/welcome.pdf> [Accessed April 10, 2009]

(Menzies 2008). Biomass Forest Management: Talloil Case Study. Canadian Silviculture Magazine, [internet] November 2008. Available at: <http://www.canadiansilviculture.com/win07/talloil.html> [Accessed February 11, 2009]

(Northern Ontario Business Staff, 2008). Getting into the bioenergy boom. [Internet] April 11, 2008. Available at: <http://www.northernontariobusiness.com/Industry-News/forestry/Getting-into-the-bioenergy-boom.aspx> [Accessed April 7, 2009]

(REN21, 2008). Renewables 2007, Global Status Report. [Internet] 2008. Available at: http://www.ren21.net/pdf/RE2007_Global_Status_Report.pdf [Accessed April 8, 2009]

(Re-energy.ca, 2007). Biomass Energy, Background. [Internet] 2007. Available at: http://www.re-energy.ca/t_biomassenergy.shtml [Accessed April 9, 2009]

(U.S. Department of Energy, 2008). Energy Efficiency and Renewable Energy. [Internet] December 30, 2008. Available at: http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12570 [Accessed April 10, 2009]

(Wikipedia, 2009). Wikipedia, 2009. Wood Pellets. [Internet] February 7, 2009. Available at: http://en.wikipedia.org/wiki/Wood_pellets [Accessed February 12, 2009].

(Wood Resources International, June 2008). Forest Newswire. [Online] June 6, 2008.

Available at:

http://www.forestnewswire.com/index.php?view=article&catid=1:latest&id=156:worldwide-trade-of-wood-pellets-reached-a-record-three-million-tons-in-2007&option=com_content&Itemid=53

[Accessed February 11, 2009].

(Wright 2008). Pellet Industry, MACTARA. [Internet] 2008.

Available at: <http://wstc.unbf.ca/documents/UNBMACTARAPRESENTATION-MilesWright.pdf>

[Accessed April 11, 2009]