



Marketable Waste Wood on Vancouver Island

Prepared for the Vancouver Island Economic Alliance and Foreign Trade Zone Vancouver Island by

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Marketable Waste Wood Business Case

Product Overview

In a 2017 report on value-added wood manufacturing, VIEA suggested there were viable business opportunities for new ventures. One challenging aspect to the discussion was the availability of raw materials. This non-market force was discussed earlier and suffice to say it is being addressed. The discussion however, did illustrate a compelling opportunity involving the utilization of wood material that is either overlooked or left on the forest floor. This fibre is generally not available as feed stock to any further processing as pulp and paper, small cut dimensional lumber, or value-added manufacture. As a result of this gap, there is a case to be made for generating wealth from activities involved with extracting from the forest and thereby generating a supply of marketable waste wood.

One such opportunity involves exporting wood to China for use as raw material to the wood packaging industry. The global wood packaging material market sometimes referred to as Non-Manufactured Wood Packing (NMWP) or Solid Wood Packing Material (SWPM), is part of a hardwood and softwood¹ sector. Wood packaging materials are different from wooden products such as plywood, particle board, oriented strand board, veneer and wood wool. These are created by using glue, heat, and pressure or a combination of techniques. Wood packaging materials are used in supporting, protecting, or carrying goods. Different examples of wood packaging materials include pallets, crates, boxes, cases, bins, reels, drums, load boards, skids, pallet collars and containers.

Depending on product type, the wood packaging materials market is segmented into Wooden Pallets and Wooden Containers. The main advantage of using wooden containers and pallets for packaging is that it can be reused and in case of damage, repaired for reuse. Use and reuse can be for up to 4-5 years, with diverse applicability for packaging in areas such as of food & beverages, grocery items, telecommunications, dairy, automotive, chemicals and construction, to name a few.

¹ *Wood Packaging Materials Market Application and Industrial Growth, 2018, <https://globenewswire.com/news-release/2018/02/28/1401033/0/en/Wood-Packaging-Materials-Market-Application-and-Industrial-Growth-Profshare-Market-Research.html>*

Increasing demand for industrial-product packaging has brought variety of rigid and flexible packaging designs to the market. Packaging is an important contributor to overall product safety. It allows clean transition with less interference of human contact, while providing advantages in the sale process. For shipping of larger consignments, rigid packaging materials like wood are used.

A value-added wood packaging product that can be exported from Vancouver Island is dimensional lumber cut to minimum sizes of 90 millimeters square by about 2 metres in length. Unlike other wood products, timber destined for wood packaging is not subject to moisture-content or species requirements. Recovered Marketable Waste Wood destined for foreign packaging manufactures can simply be pretreated with spray to counteract the risk of mold growing during shipment. The critical factors in using VI waste wood for export are assembling, milling (sizing), and containerizing for ready shipment to China.

Business Overview

Overall annual US-based pallet industry production in 2016 was estimated at 849 million wood pallets (508 million new and 341 million recycled). This output represents an overall 14% (22% increase for new pallets and 5% for recycled) increase compared to 2011 results – previously the most recent data available.

Lumber consumption in pallet production is estimated to range between 4.1 and 5 billion board feet in 2016, with a ratio of 45% hardwood and 55% softwood. Pallet production uses 43% of hardwood and 15% of softwood produced in the US.

The Timber Packaging and Pallet Confederation (TIMCON) has warned that shortages in the supply of small logs have reached an unprecedented level due to the ongoing combination of high global demand and supply scarcities. TIMCON is a not-for-profit trade association representing the UK's interests in wooden packaging. The scale of the business is huge. Every year over 1.5 billion pallets are produced worldwide, using approximately 60 million cubic metres of timber².

² <http://www.timcon.org/Manufacturers/FactSheets/>

As reported in an April 2018 article about the UK pallet industry, an estimated 42.5 million new pallets were produced in 2016, up 5.6% compared with 2015. In the same period, an estimated 41.4 million pallets were repaired, up 6.2% over 2015. Total UK turnover from manufacturing pallets was £268.1 million; while turnover for repairing pallets was £90.2m. There is however, a looming crisis in the UK timber packaging industry as a result of the following:

- High demand globally, in particular China.
- Scandinavian timber flowing primarily to the U.S. construction market.
- An unfavourable exchange rate caused by Brexit.
- Baltic supplies down.
- Good UK demand.
- Subsidized biomass industry buying up small logs previously destined for the the packaging and pallet sector.
- Adverse and changing weather, which is affecting the harvest of home-grown timber.

Of note from this list is that global demand supports the premise that increasingly, China could be looking towards British Columbia for a non-traditional supply of wood for it's packaging sector. Supplying marketable waste wood from Vancouver Island could be quite lucrative however, the key success factor will be the ability to ensure there is a sustainable and exportable supply.

Waste Wood Availability on Vancouver Island

Waste levels have been increasing significantly over the last decade. The trend for cutting on the Island is for more remote sites. There is also a higher transportation cost resulting in more wood being left on the ground. There is a move towards more intensive forest practice and reducing the quantity of waste wood left in the forest. Not only will waste wood removal provide access to raw materials for the pulp and other industries, but it will reduce the threat of fuel buildup that contributes to the forest fire hazard. The removal of waste wood represents a positive alternative to the current practice of waste-pile burning. Non-burning alternatives have the advantages of reducing CO2 emissions and improving air quality in communities close to burning activities. Quality of life will be improved and a value-added manufacturing solution will improve availability and types of jobs. Universally, stakeholders have expressed a strong desire to move away from current practices.

Waste wood accounts for approximately 2.6 million m³ per year on Vancouver Island however, competition for this raw material is stiff, with the pulp and paper industry indicating a shortage of feed stock. At this time Vancouver Island pulp mills are net importers of pulp.

There is an overall shortage of fibre supply not only in British Columbia but worldwide. In BC, the Mountain Pine Beetle, wildfires and harsh winters have dramatically reduced timber availability. The wood packaging industry freely utilizes beetle kill and burnt wood.

There exists a strong mandate within Provincial Government regulators to manage and make available waste wood. The Ministry goals include identifying opportunities for business-to-business discussions. To this end they have encouraged communication between the primary harvesters and secondary users, recognizing that a market-based approach will lead to the most efficient solutions for removing waste wood, and making it available for further processing.

In June of 2018 the Government's District Forest Manager for the South Island created a pilot project called the "South Island Forest Recovery Zone (FRZ)". FRZ's are identified as areas where residual fibre has potential to be harvested economically, and where fibre demand is strong. Under this pilot program, the District Manager can issue a fiber recovery license to a party other than the primary harvester. The policy is intended to encourage discussion and perhaps action towards removing waste wood on Southern Vancouver Island. It is also hoped that the actions will serve to maximize the efficiency of the annual allowable cut (AAC).

The forests on Vancouver Island have numerous owners with various rights to cut timber. More than 95% of standing timber on the Island is owned by the Crown meaning that harvesting rights are largely controlled by the Provincial Government. The majority of timber is available to be harvested either by holders of Tree Farm Licenses (TFL's) or through First Nations treaty lands. Significantly lower numbers of lumber sellers on the Island means that some industries are dependent on logs for feed stock. They are at a competitive disadvantage in accessing the raw materials compared to their mainland counterparts. It has been said that labour deregulation or decreasing the influence of trade unions has opened the market to more competition yet the value chain is very restricted because of lack of diversity in licenses to cut timber. The market dynamic of the forest industry on Vancouver

Island is dramatically different from that of mainland British Columbia. While more than 90% of the Island's trees grow on Crown land, tree farm licenses are held by very few players.

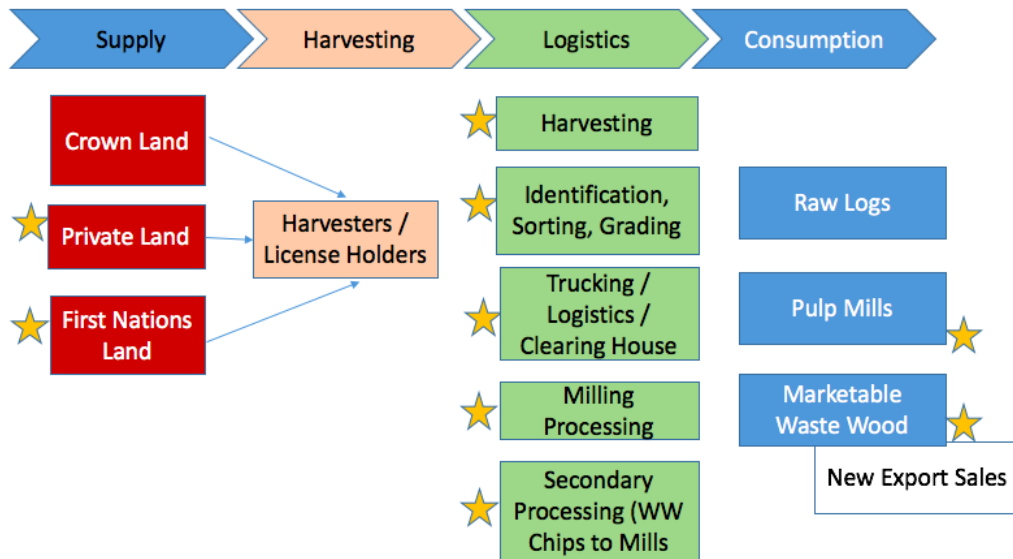
The immediate and perhaps lowest risk method for accessing waste wood, may lie in the ability to access fibre on private lands including First Nations properties. This could have the added advantages:

- Creating new and sustainable employment opportunities in First Nations communities
- Private sector opportunities being less susceptible to non-market forces
- Private sectors opportunities being easier to bring to market, and more suitable for demonstrating the long term sustainability of marketable waste wood ventures.
- The collateral advantage of bringing new opportunities to coastal communities may be the improvement of the social license of the Forestry Industry.

Value Chain

Figure 8 represents the marketable waste wood value chain for the purpose of this business case. As mentioned the likely best supply of wood is from private lands including First Nations holdings. Therein lies the fewest barriers to harvesting. Value can be realized by the primary license holders and those sub-contractors set to harvest. Included could be stewardship goals and perhaps increase monetization of standing timber assets.

Figure 8 Marketable waste wood value chain with stars showing potential partnerships through FDI.



The value chain could be improved over existing practice with new/advanced technologies for species identification, sorting and grading. This would encourage the development of new skill sets with a broader community employment opportunity. Equipment that is smaller than traditional log hauling vehicles would be required for Marketable Waste Wood transportation. There has been the suggestion that smaller trucks would be less efficient in getting the wood to a sorting facility. Perhaps new approaches such as bins loaded at the cut blocks are necessary to mitigate inefficiencies.

There may also be a need for new approaches to MWW sizing in the value chain. The wood can be processed using smaller, perhaps even portable mills at the cut block. A key necessity is the value in centralized log sorts to act as a clearinghouse where the timber can be sorted based of value for specific secondary processing. As stated earlier, the pulp and paper industry is eager to absorb as much raw material as available due to the feed stock shortfall on the Island. An integrated value chain approach could support a win-win situation where, for example, the wood packaging manufacturer could make the residual chips from milling available to the Islands' pulp and paper companies.

Financial Overview

The MWW opportunity starts with the assumption that feed stock is available. An investor would have to cover items such as the survey to get a rough order of magnitude of the amount of wood available. The BC Government regularly surveys the volume of waste wood from logging operations. Those estimates are published on a regional basis. It is likely a better estimate is required. There are survey technologies available today, drones for example, that could carry payloads such as cameras or LiDAR (high resolution laser mapping tool) to assess size and species. A level of research and development will be necessary before full deployment is likely. The BC Government has suggested it would be supportive of such research.

It is also expected that the investor would have to cover extraction, transportation and milling. There are numerous companies on Vancouver Island that are capable of this contract. In addition, expertise exists within the Island's First Nations communities to do this work. Skills training is available.

The investor would also be required to cover logistics and export. As suggested earlier, the port infrastructure on the Island is considerable and available. A ballpark estimate for shipping a 40' container of wood to Asia is about \$1,500.

Performa Income Statement

Table 8 is a proforma income statement used to illustrate the breakdown of key elements in calculating the flow of revenue and expenses for a theoretical marketable waste wood enterprise. This is an end-to-end venture meaning the company sources the raw material. That being residual wood following logging operations on Vancouver Island in the forest. The company either mills the wood onsite using portable wood mills or transports the material to a log sort. In addition to burn piles and usable material remaining at the top of the stump being acceptable, limbs meeting a minimum dimension objective are also useable to the end client. Dimensional cuts are containerized and transported to a port where they are shipped. End clients in China have been identified.

The revenue number expressed in Table 8 is derived from a price paid per m³ in 2018. The assumption is that 10,000 m³ per month is sold at a price of \$225 per m³. Estimates are, that due to the growing global shortage of wood-for-packaging materials, Chinese factories are willing to purchase

up to 20,000 m³ per month. Cost of sales and operating expenses were derived from Industry Canada’s baseline Financial Performance – Canadian Industry Statistics for forestry and logging companies³. The results indicate a net income of 19% on a gross profit of 76%. One BC enterprise is reported to have shipped 12,000 m³ of waste wood into this market space in 2018.

Table 8 Proforma income statement for a generic enterprise selling raw material into the wood packaging manufacturing industry in Asia.

Revenue (10,000 m3/mo @ \$225/m3)	\$ 27,000
all values in 000’s	
Cost of Sales	
Labour	\$ 1,620
Wood	\$ 960
Transportation	\$ 3,780
Total	\$ 6,360
Gross Profit	\$ 20,640
<i>Gross Profit %</i>	76%
Operating Expenses	
G&A	\$ 11,880
Labour	\$ 4,860
Operating Income	\$ 3,900
Net Income Before Tax	\$ 5,000
<i>% of Revenue</i>	19%

Potential Partner Opportunities

One Chinese company with the potential to partner on the value-added manufacturing of waste wood is Shanghai Xintonglian Packaging Co., Ltd. They engage in the production and sale of packaging products in China and internationally. The company offers paper, wood, and plastic and cushioning packaging products. It also provides iron box packaging products, hollow board packaging boxes,

³ Industry Canada’s baseline financial performance Forestry and Logging.

<https://www.ic.gc.ca/app/scr/app/cis/performance/rev/113>

stickers, desiccants, shockproof labels, shockwatch tilt displays, and single angle anti-tilts. In addition, the company offers inventory management and packaging services. The company was formerly known as Shanghai Xinliantong Packaging Materials Company and changed its name to Shanghai Xintonglian Packaging Co., Ltd. in June 2011. The company was founded in 1999 and is based in Shanghai, China. This company currently buys wood from the BC interior.

