



USAID | **KOSOVO**
NGA POPULLI AMERIKAN
OD AMERIČKOG NARODA

WOOD PROCESSING REPORT

KOSOVO CLUSTER AND BUSINESS SUPPORT PROJECT



21 October 2005

This publication was produced for review by the United States Agency for International Development. It was prepared by the KCBS project team of Chemonics International Inc. based on a Final Report prepared by Short Term Technical Advisor, Matt Anderson.

WOOD PROCESSING REPORT

REPORT ADDRESSES DEVELOPMENTS AT KOSOVO'S LARGEST FULLY INTEGRATED WOOD PROCESSING OPERATION. IT ALSO IDENTIFIES OPPORTUNITIES IN THE MANUFACTURE OF ENGINEERED WOOD FLOORING AND EXPORTS TO THE UNITED STATES.

Kosovo Cluster and Business Support project "Wood Processing Report"
Contract No. AFP-I-00-03-00030-00, TO #800

This report submitted by Chemonics International Inc. / 21 October 2005

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

CONTENTS

BACKGROUND	1
EXECUTIVE SUMMARY	3
FIELD ACTIVITIES TO ACHIEVE PURPOSES.....	4
TASK FINDINGS	20
CONCLUSIONS AND RECOMMENDATIONS.....	21
ANNEXES	24

PURPOSE OF ASSIGNMENT

To provide technical assistance and advice to the management of Wood Combine, the first of the fully integrated wood processing state owned enterprises (SOEs) to be privatized, and to introduce quality norms and lumber grading rules for beech and spruce logs for implementation at Wood Combine's facility.

Although intended as a general guideline for this STTA, the content and direction of the SOW changed once the consultant arrived and held initial meetings with the management of Wood Combine. Due to the company's recent decision to pursue an entirely different path in their development, there was considerable deviation from the original intention of the SOW. The EAR/FAO recognizes the need in Kosovo for the development of a small log sawmill designed to process the large volume of raw material available in this size range (12-40 cms diameter). And, although Wood Combine is the logical location for such a facility, the owners have shelved the potential installation of a small log mill at present, but agree the project may have merit in Wood Combine's future operations. Assistance under this STTA was then refocused to address areas integral to the sawmill operations that management believed would most significantly impact production. This included assistance with the log yard, quality assurance, machinery acquisition, production flow and machinery requirements for window scantlings and edge glued panels, best-practice sawing, edging, trimming and product mix. Due to the short time allotted for this STTA, much of the assistance and discussion points will be presented in a journal format that can be used as reference material for Wood Combine's management.

The SOW was amended due to Wood Combine's request for specific assistance other than those initially proposed, but also since the potential for manufacture and export of engineered wood flooring has been identified and explored. It will be briefly discussed under background and in more detail in a separate section of this report. The COP and consultant agreed that, as a subset of this SOW, it was prudent to pursue assistance to Kosovo wood processors interested in this venture, because of the long term export potential involved, where wood flooring and ancillary products could conceivably generate 2-3,000,000 euros in monthly sales for select Kosovo processors. Intensive technical assistance and training would be required over the initial 8-12 month period required for facility retrofit, machinery acquisition, products and supply chain development.

BACKGROUND

A former SOE in Peja, privatized in the first quarter of 2004, Wood Combine afforded the first opportunity to work with a fully integrated operation from sawmill through finished product manufacturing. After initial acquisition costs of 2.5 million euros for privatization, and with this consultant's team providing assistance during the KCBS and KBS projects, the Albanian-American owners and resident Kosovo management adopted long range strategic plans that consisted of five development stages with a projected capital investment of another 7 to 8 million euros to modernize the sawmill, dry kilns and secondary wood processing facility. In addition, they have also explored development of complete facilities for manufacture of corrugated board and boxes and PVC pipe. When operational, these facilities have the potential to employ over 600 workers from the Peja region, and are a key example of the bright future for wood processors and other manufacturers in Kosovo.

Considerable progress towards completion of the stages in their plan has been accomplished to date:

- Stage 1: Repair and make operational dry kilns and boilers. Completed at a cost of 50,000 euros
- Stage 2: Installation of a state of the art saw manufacturing and filing room. Completed at a cost of 200,000 euros
- Stage 3: Installation of state of the art primary and secondary sawmills. Equipment cost of 300,000 euros
- Stage 4: Finger joint and gluing operations. They are currently reviewing equipment information resourced at the Milan Machinery and Trade show in May 2004 with the Weinig Machinery Group from Germany. Estimates of capital investment for purchase and installation will include machinery and building modifications of approximately 750,000 euros.
- Stage 5: This stage is still a work in progress. They plan to develop secondary manufacturing, such as window scantlings and edge glued panels, but are exploring other products as well.

The enormous investment in buildings, machinery, equipment, training and time required to properly develop full service sawmills has hindered the critical development of this sector. Minimal advancements made in facility improvements and processing practices within this sector have allowed lumber imports, primarily from Croatia, Montenegro and Bosnia, to flood into the Kosovo region further retarding the development of this sector.

Wood Combine is presently the largest privatized fully integrated sawmill in Kosovo; and as such, its performance is critical to the development of the secondary wood processing sector and to reducing the dependency of imports in Kosovo. Since beginning an extensive facility retrofit, the company is a potential leader in the industry whose state-of-the-art development will set a higher standard for which all the other processors in the cluster will strive.

Wood Combine has installed a headrig (primary log breakdown) and resaw (secondary breakdown) to process logs in the 30-70cms diameter range with the capability of processing logs from as small as 8cm and large as 120cm. The startup of this phase of their retrofit began in August 2005, and there is need for continuing technical expertise to insure the efficient processing of logs to maximize the benefits of this investment. The intent is that their efforts will reduce, to some extent, the reliance on lumber produced outside of Kosovo, and instill confidence in lumber "Made in Kosovo".

In the future, there will still be a need to secure a stable supply of logs to meet the needs of the new operation. Providing this assurance, and establishing contractual arrangements, is the responsibility of the Ministry of Agriculture and Forestry and the Ministry of Trade and Industry. The EAR and FAO have a program addressing this issue, and forest certification under a sustained yield management program is a factor in acceptance of potential export products from the region.

EXECUTIVE SUMMARY

The potential for development of the primary and secondary wood processing industries in Kosovo as a source of stable employment and a significant revenue stream for the region has been identified by several USAID sponsored consultants over the past 5 years. With continued support from donor agencies, companies like Wood Combine have an exceptional opportunity to become the basis for a strong manufacturing sector in Kosovo, but many companies stress that there must be a continuity of assistance provided by professionals who have practical industry expertise, not theoretical knowledge.

Although individual manufacturers within the wood processing sector have challenges unique to their particular operations, focus group discussions indicate these producers all experience many similar constraints that affect the overall industry. Some of their primary concerns are still a consistent supply of electric power, lack of general management and operations knowledge, and inability to obtain favorable long term financing for capital investments – the KCBS project is scheduled to support a Finance Fair in Kosovo in early November at which workshops will be held to help businesses understand the loan application process and effects of capital equipment and operating cash loans on the overall profitability of their business. Several other issues have been significantly alleviated over the past two years due to recent legislation and increased involvement by public sector departments in industry work groups and professional industry associations meetings, where there is opportunity to gain multi-level awareness and propose solutions to challenges facing Kosovo's manufacturers. Still, the most visible benefits have been gained through the efforts of donor programs that provide hands-on technical expertise from industry experts through projects like those funded by USAID.

There is still much work to be done - there are no short cuts in this industry – to paraphrase Roy Lapof, IESC/CDC in his 2001 Sector report. . .

“...The Wood Processing industry has been primarily discussed in macro terms. It appears simple from the 30,000 foot level. However, its simple appearance is extremely deceptive. It must be examined at the micro level to really see the extreme level of management skills, organization and discipline that are required for survival by a manufacturer in the industry dependent on a highly competitive global economy....”

During my tenure with the former KBS project, I proposed the potential for exporting certain wood based products from Kosovo to the US, and over the past two years have actively pursued bringing together several Kosovo wood processors with SwedeCo Flooring, a major engineered wood flooring manufacturer/importer/distributor from the US with operations in Indonesia, Asia and China. Gerald Perlot, President and CEO of SwedeCo Flooring expressed significant interest when presented with the opportunity to expand his resource base, and requested profiles from companies with adequate capability for producing primary products to meet the global resource requirements of several large wholesale/retail distributors in their US client base, that distribute primarily into the contractor and homeowner do-it-yourself markets. From profiles of a dozen KBS client companies, SwedeCo selected Korenica, Ukaj, and Brovina as companies of interest and wished to explore further their individual or joint manufacturing capabilities. I have also discussed the ongoing developments at Wood Combine and their potential for exporting lumber and other components. Mr. Perlot has, however, expressed some concerns about the lack of "certified graded" Beech lumber for export into the US market, and I have shared with him some of the initiatives being explored by AWPK and several of the local processors with regard to certification in Kosovo.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

With only 18 working days to accomplish the tasks identified in the SOW, time was focused on direct hands-on assistance. Daily activities are presented in journal form to illustrate a detailed grass-roots perspective of the high level of sophisticated technical machinery, equipment and processing knowledge, years of continuous training and operations expertise required to survive in this highly competitive industry. Although using layman's terms where possible, much of the dialog is highly technical in nature, which will serve as a reference and guideline for follow up activities by KCBS local professionals.

Sunday – 9/18/05: Upon arrival in Kosovo late Sunday afternoon, met with Burim Meqa from KCBS and Afrim Brovina, a wood processor from Gjakova to discuss engineered wood flooring. Samples were supplied by SwedeCo, and the specifications for producing the laminated product were discussed in detail, along with FOB pricing, projected production volumes, equipment, manning and facility requirements.

Brovina asked about constructing a building on a parcel of land that he owns, and it was suggested that he consider leasing a building of the size required for several reasons:

- Construction funds could then be used for operating capital and purchasing equipment.
- He would have time to develop the product line and determine future facility requirements for construction at a later date.
- It would minimize his initial capital investment exposure.

Discussed opportunity to explore other exportable wood product lines, and how this US company can assist by offering direct contacts or by helping to develop connections in the US and European markets. Once the supply chain is established, there is endless opportunity.

Monday – 9/19/05: Met briefly with KCBS COP, Martin Wood to discuss the deviation in strategy for the SOW, and my being located in the Peja region for the duration of the STTA to alleviate the 3 hours of daily travel time between Pristina and the Peja region, allowing for more time with Wood Combine and the potential wood flooring producers Korenica, Brovina and Ukaj.

Korenica: Met with Mustafe Korenica to detail the wood flooring project and some issues with dust collection and edge gluing. The engineered flooring product has a similarity to the process for making door stiles in his current production. The concept is identical and there appears to be no problem in manufacturing the core structure, but some concern was expressed about the finishing process. The finish requirements for the product are completely different from their current process and he understands the level of quality that would be needed.

Korenica was meeting with USAID on Tuesday, and he indicated that he would request more intensive assistance from KCBS considering his operation's growth rate and pending expansion into the remainder of the building they currently occupy. If he fails to win the contract for privatizing this building, he intends to construct a building in the spring on property he owns adjacent to this facility.

Ukaj: Met with Sheqer Ukaj and had a similar discussion about the engineered wood flooring project. Had a basic Q&A session about the product, volumes, equipment, facility and capital requirements.

We discussed his participation in a trade show in Germany and the interest he was receiving about his product line. He had one serious inquiry for several thousand chairs per month, FOB Peja - with the chairs shipped assembled. I discussed the possibility of Ukaj exporting chairs and tables to the US, and what would be required to label and package them properly for US export.

Wood Combine (WC): Met briefly with the operation's marketing and sawmill managers to discuss their current sales strategies, which included an explanation of how, based on the market and their pricing structure, they are basically "swapping dollars at best". Pine logs are currently purchased from Montenegro at 85 euros per cubic meter delivered, and the sawn product is selling at 165 euros per cubic meter, barely recouping production costs. WC is producing lumber solely for the construction market, which generates a lower profit margin compared to other wood products. It appears they are still selling into the old traditional local markets that will be marginally profitable primarily due to past pricing practices.

Although WC believe they are getting a 70% yield from the logs purchased, industry standards suggest that number to be closer to a 60% yield; and at that percentage, without any other costs calculated, the profit margin is very low. Additional discussion about yields was scheduled for Tuesday, and they set up an internet equipped office, so we have a permanent work station for the duration of the assignment at their facility.

Tuesday - 9/20/05: Travel time and schedule conflicts with WC management made for a short day at Wood Combine, so a full analysis of current activities was delayed until the following day.

Ukaj: Met with Sheqer Ukaj to discuss his interest in engineered flooring. He purchased 1.5 hectares (approximately 3.5 acres) of land outside Pristina for 370,000 euros and started construction of a 2160 sq meter building, scheduled for completion April 2006 with the intent to relocate his manufacturing operation. Another 2160 sq meter section is to be completed in 2007. Ukaj has the capital to purchase the basic equipment to manufacture flooring, but would need help with acquisition of the finishing equipment. He inquired whether SwedeCo would invest or might have a solution for acquisition. I told him I would pose the question to SwedeCo and relay their response. He had already made some internet inquiries for a gluing press and other equipment he thought would be needed.

I suggested that Ukaj and Brovina consider a joint venture, since both companies are willing to invest in a facility for engineered wood flooring. Technical production related questions were discussed and presented to SwedeCo. Ukaj asked for samples so they could experiment with making their product proto-type while I was still in Kosovo, and that sample has been shipped to SwedeCo for review.

Wednesday 9/21/05: Learned today that Sheqer Ukaj and Afrim Brovina have agreed to a joint venture to manufacture engineered flooring. All the details are yet to be worked out, but I believe this agreement will come to fruition.

Met with KCBS COP to express my concern with Wood Combine's slow response to date. They do not seem motivated to accept KCBS assistance, and several critical meetings have already been postponed due to schedule conflicts with WC's management. That said, after reading a letter of intent from SwedeCo to explore wood flooring, KCBS COP agreed to pursue the engineered wood flooring more aggressively if Wood Combine fails to respond to the assistance offered. We were both concerned about achieving the deliverables for the SOW, and I indicated my intention to work as closely as possible with the Sawmill Superintendent to insure KCBS provides as much

technical assistance as possible, given limited access to management at present. I am also prepared to move forward with efforts to initiate the engineered flooring project, particularly with news of the possible joint venture between Brovina and Ukaj, should Wood Combine opt to decline assistance. Based on the situation, we will make a decision as to the appropriate course of action by Friday.

Wood Combine: Worked with the sawmill manager to create a simple basic operations statement to help indicate what they were doing based on numbers they provided. This was a “wake-up” call since he could actually see that they were either breaking even at best or more likely that their costs were higher than sales income. An operational analysis of the facility is scheduled for Thursday with the sawmill manager.

Thursday – 9/22/05:

Wood Combine: Began the sawmill operations analysis, although the sawmill manager was only available for part of the day. In his opinion, the sawmill is fully operational and they are in need of no further assistance. I decided to start the analysis without anyone in management present and would review results with them later.

The walk-thru included a tour of the filing room, which has all new equipment; unfortunately, I learned that their filers had only a brief training session at a Bosnian mill that had similar equipment. I explained that saw filing is as much an art as it is a very technical profession. Certification in this profession, in the US, is accomplished only through apprenticeship and intensive on-the-job training, not through technical schools, and that proficiency can take up to 3 or 4 years. The actual process of building saws from metal rolls is straight forward, but the skills for repairing and troubleshooting saws is an acquired knowledge. A skilled saw filer can “read the saw in for repair”, understanding the root cause of the problem. He knows, from practice, whether the problem is the saw or the equipment where the band is installed.

It was noted that Italian equipment, like that installed in the mill, typically uses the same size bands for the primary head rig and secondary breakdown, so it is imperative that they keep the bands for each machine separate and be sure not to mix them. This is a critical step for the maintenance and trouble shooting process necessary in proper band and equipment maintenance care accomplished by the saw filer or filers.

From the discussions to date I have the feeling that they are desperate to start producing revenues and taking orders regardless of profitability. But, they have no idea how to analyze an order for that purpose. The concept of “if you produce it - they will buy it” is obviously in place here. The old integrated SOE approach is the current mentality of the existing management.

Dozens of photographs were taken throughout the facility today and will be shared with WC management to help illustrate current practices and what can be done to improve the operation based on industry best-practices. A synopsis of the photo descriptions is a prime example how, even if management believes the mill is operating efficiently, there is still considerable ongoing industry expertise and training that will be needed to bring Wood Combine up to the level of a profitable state-of-the-art mill operation – many of these issues will be addressed in quality assurance and detailed in subsequent daily activities:

- Available space that can be used for a proper installation of a log yard
- Requirement for proper drainage and surface for such an operation
- Area for installing sprinkler system to keep log inventories from spoiling

- Area for set up of a proper log receiving and scaling area needs to be set up as this process is currently being done in the log storage area.
- The inventory practice of “FIFO”(first in, first out) needs to be established to assure proper log inventory rotation
- Current condition of log yard which illustrates that nothing was done to prepare the log yard surface for proper operation.
- They are using a piece of log handling equipment capable of handling the conditions.
- Condition of ground in front of log infeed to sawmill
- Log scaling prior to being sent to sawmill
- Current log receiving practice and check scaling
- Log scaling with no attention to log quality or grade
- Examples of improper log handling, storage and inventory rotation (bearing in mind the mill had not run for several months prior to the recent modernization)
- An extreme example of logs being culled out, because they cannot be sent to sawmill for processing. This displays the need for a bucking station before sawmill because if properly bucked into 2 logs, 3 meter and 2 meter, they could be sent to the sawmill rather than ending up in the cull log deck with the end use more than likely being fire wood.
- Air drying storage, one of several around the mill, displaying improper setup
- Improper sticker placement - a uniform sticker should be used to prevent sticker degrade during drying.
- Slabs generated on the resaw from the heavy slabs sawn on the headrig. With no waste removal system at this point of the production they are discarded generating a pile to be cleaned up at a later date
- Shows slabs from resaw stacked into bins to be removed to the firewood processing area. They get 25 euros per cubic meter as fire wood. They spend more time processing firewood then they do properly sawing lumber
- Loads of lumber scattered everywhere for air drying. Indicates poor housekeeping that is repeated throughout the facility.
- Finished charge in dry kiln, insufficient dry storage. No inventory control methods, loss of space in dry kiln because of unedged lumber. The units do not set flush together causing poor air flow. In part, causes lumber degrade resulting in lower yields for product and revenue.
- Current dry kilns consisting of 4 dry chambers with each chamber having the potential of 100 cubic meters capacity. Allegedly drying 700 cubic meters of material a month.
- No hog or chipper for processing edgings or trims
- Vacuum system (pipe with section missing) for removing sawdust or hog/chipped material (hog needs repair).
- Unedged cants being returned to headrig because secondary breakdown band mill cannot handle this size because it is under powered and was not engineered for this material. This practice results in lost production since the headrig is handling the material twice.
- Infeed table to secondary band mill. Notice the heavy slabs generated at the headrig. This is their solution for minimizing band damage at the headrig. This practice increases waste and leads to under utilizing the logs revenue return. This also creates a bottle neck at the resaw with the small slabs created by processing the heavier slabs
- Infeed table to secondary band mill, with the heavy slabs generated at the headrig. This is their solution for minimizing band damage at the headrig, but, this practice increases waste and leads to under utilizing the log’s revenue return.

It also creates a bottle neck at the resaw from increased volume of small slabs created by reprocessing the heavy slabs.

- The outfeed side is where the waste slab must be removed by throwing it out a window into a pile. The operator and helper spend more time in cleanup than in production.
- Resaw being used as secondary breakdown
- Unedged cants being loaded onto infeed deck to the headrig. Shows the poor material handling currently used. The freshly opened face gets covered with dirt which will cause saw problems.
- Drop down on headrig infeed deck for log separation
- Small diameter logs being loaded that are better suited for a small log operation and not a large mill.
- Sawn face indicating a board with good cuttings for higher end product use than that for construction grade material.

WC management requested that I meet with Axel Keiffenheim, the Weinig Machinery Group representative from Austria, in Peja to discuss the planning for secondary manufacturing processing equipment and layout. I had sourced this equipment manufacturer for Wood Combine during the KBS sponsored attendance at the 2004 Woodworking Machinery Show in Milan, Italy. Although not aware of the Weinig visit, we participated as advisors on WC's behalf, and started discussions with Axel to get a basic understanding of what WC intended to accomplish.

WC estimated that there would be a volume of 15 cubic meters per day from the saw mill and that the secondary products expected to be produced from this volume would be finger joint window scantlings (finger jointed 3 pc laminated S4S), edge glued panels from finger joint and strips, and parquet. The scantlings would be produced from softwood and the other products from hardwood. Armed with very basic information, Axel wanted to see the current operation in order to get an understanding of production capabilities - his comments concur with my findings:

- Why is so much time spent sawing the small logs on the headrig (currently sawing spruce for construction materials)
- Spending a great deal of time to make crating, not quality sawn lumber
- Why using coal to fire the boilers and not the wood waste generated in the sawmill
- Spend more time handling waste and products from edgings than doing a quality job of producing lumber.

The formal Weinig presentation was scheduled for Friday and in the interest of capital expense planning (not actually part of SOW) and for future job creation it was prudent to participate. At this point, we determined that Wood Combine has little or no interest in a small log operation, at this time, and the investment planning for such a venture should be eliminated from the SOW.

Brovina: Compiled a list of technical questions about the manufacturing process for engineered wood flooring and request for copy of Indonesian plant layout with specific equipment list so Brovina and Ukaj could begin planning for the financial investment. This is addressed further in Annex IV of this report.

Friday 9/23/05:

Wood Combine: The Weinig presentation and subsequent discussions with WC management regarding this planned expansion became an all-day event. WC had given Weinig no information prior to the arrival in Peja, and we started from ground zero in

developing the production capacities for the proposed production line. WC management attending Weinig presentation:

Hysen Gecaj, Minor Owner
Ahmet Zogaj, Accountant, Financial Manager
Pajazit Tolaj, Production manager

Products planned for manufacture:

- 1) Softwoods - Construction materials: from softwoods pine or spruce
 - a. Timbers
 - b. Boards
 - c. Batons (from edgings developed in sawmill)
 - d. Lumber from higher grade material to be kiln dried and processed into other products primarily finger-joint for window scantlings
- 2) Hardwoods – Furniture materials from Beech
 - a. Elements
 - b. Finger-joint
 - c. Turning squares
 - d. Edge and face glued materials

Breakdown or transfer equipment was not discussed, but will be calculated and shown in proposed layout and quote for the project. We stressed flexibility in equipment to allow the largest range of processing for a finished product, based on their projected sawmill production.

Basic production requirements for dry (rough) mill: Estimated production from sawmill after kiln drying is 15 cubic meters per day edged and unedged lumber of various thicknesses (18mm, 25mm, 32mm, 38mm, 42mm and 54mm) with the average being 32mm of the total volume.

The proposed equipment required to manufacture the products described, with the volumes suggested, on a single shift basis:

- 1) Multi-gang rip saw with 2 movable saws (KM 310 M2), laser line networks and infeed and wide board return for further ripping. Maximum ripping size is 308mm with a maximum board width supported of 600mm. This operation will give them the ability to selectively rip multiple widths at the same time or gang rip fixed widths.
- 2) Cut to length optimizing saw (Optica 2000) which automatically optimizes cuts based on marks made by the operator who is concentrating only on marking defects for removal. This operation will be used to produce finger joint and cut-to-length elements.
- 3) Finger-joint (Profijoint Combination) with the capability of producing both horizontal and vertical joints for use in different applications.
- 4) Moulder (Unimat Super 4) specialized for preparing edges for edge gluing after finger-joint operation.
- 5) Edge Gluing (Profi-Press T5.5) for batch gluing material to be edge glued.
- 6) Sanding using a 2 roll top sanding machine edge glued panels.
- 7) Machinery not addressed was the moulder - used to S4S the laminated scantlings and the vertical press used for gluing the 3-ply scantlings. The vertical press for gluing scantlings is a minimal cost, but the moulder is a major piece of equipment (this piece was literally overlooked).

Saturday – 9/24/05

Wood Combine: We met with the WC group again to finalize the discussion on the proposed requirements for the dry (rough) mill starting the day before. We had additional WC management members attend plus representatives from Gornji Ibar, another wood processing company located in Montenegro, interested in the Weinig presentation and equipment line.

WC management attending:

Hysen (Hou-sen) Gecaj / minor owner 044-162-997

Ahmet Zogaj / Accountant, Financial Manager 044-223-824

Rexhep (Ra-jhep) Shabanaj / Sales & Marketing

Pajazit (Pie-az-it) Tolaj / Production Manager

Ismet Lekaj / Maintenance Manager

Gornji Ibar management attending:

Grboviq Vebo, Production Technologist

Muriq Faket, Production Technologist

Mark Culaj, President CEO of Apollonia (Engineering Consultants)

Since the Weinig rep was flying out at 3pm from Pristina, he could only give a general overview of the discussions that took place the day before. It was never very clear why the other company and the consultant were taking part, but Axel believed it was to verify his presentation and validate our collective industry expertise. The Gornji Ibar company is an SOE in privatization with 700 employees and a similar production line that uses older Weinig equipment.

The presentation began by discussing the same process and equipment as described Thursday, but Rexhep Shabanaj, WC Salesman, quickly brought additional parameters into the discussion, which negated all the equipment discussed the day before. He doubled the volume from the dry kilns and increased the parameters of the material to be produced, basically requiring the purchase of more expensive equipment to handle his estimated 10-20% sales of certain products. We cautioned WC about such a move, since the estimated capital expense would probably more than double. It was suggested that there were better alternatives to running the larger sizes through the dry mill, but he insisted this material (10cm X 10cm X RLM squares) go through this process). I intend to propose an alternative, since this material is to be air-dried and not run through the dry kilns. They also have requirements for similar sizes for construction material sold green, and it makes sense to produce the hardwood square material, then to cut-to-length in a separate operation in the dry mill, keeping it from the standard production system.

Requested a current video presentation of Weinig equipment sent to me for use in similar presentations in this region. Weinig is the state-of-the-art in wood processing equipment, and I have first hand knowledge of their quality, in house training and most important after sales support. We also discussed our interest in developing engineered flooring manufacturers in Kosovo and that we would require a production line. I will send Axel basic specifications and contact info as soon as I can acquire from the US manufacturer.

Brovina: Saturday afternoon met with Brovina to begin working up a basic process and cost analysis and for engineered flooring which will be presented to Ukaj and Brovina upon completion.

Sunday – 9/25/05

Brovina has made fully equipped office space available to assist in preparation for the engineered flooring project, where we worked from 1pm to 7pm on process and cost analysis and answered product and US distribution questions.

Monday – 9/26/05:

Wood Combine: Pajazit Tolaj (Production Manager) has been our primary contact through this entire exercise, and he is finally beginning to understand how his lack of sawmill operations experience is impeding progress.

Today we discussed the dry kilns and changes that are needed to maximize kiln charges and improve drying. Listed below are the improvements needed

- Stacking rack should be made so sticker placement will be properly spaced and in the same location in every unit.
- Lumber should be trimmed to a consistent length for a uniform package to insure proper nesting of end-to-end units is done. This will allow the air to flow through the units improving drying. Air is like water; it will seek the path of least resistance, thus any abnormal openings between the units will get the air flow substantially minimizing the amount of air flow through the lumber causing uneven drying.
- Since it is unlikely the end-for-end units will maximize the kiln chamber opening a reflection plate should be placed on both ends to minimize air flow on either wall of the chamber. This practice will force more air through the units allowing for more even drying.
- No more than one thickness of lumber should be used to build a kiln charge. Varying thicknesses block the air flow through the units causing uneven drying. Also, if a substantial amount of the cross ventilation is block it forms an air dam causing the ventilating fans to work inefficiently raising operating costs and unnecessary wear and tare on the equipment.
- Kiln sticks should be of one size; same thickness, width and length and I suggested them to be 28mm thick, 50mm wide and 120mm long. The same thickness of sticker will insure that all unit courses line up as the kiln is loaded from back to front. The same width sticker will, if stickers are placed appropriately, insure that the same resistance to airflow occurs the entire length of the charge once loading is complete. The same length sticker insures that the stickers are flush with the edges of the unit and will minimize the chance of units being stacked in front of others from riding up and blocking air flow.
- All lumber should be edged in the sawmill. Unedged, random width lumber leaves twice the void space as random width, edged lumber. Lowering the volume of the kiln charge and allowing channels or open space to disrupt airflow through the units. Putting unedged lumber in dry kilns raises the cost of drying and increases the potential for kiln defects do to improper drying.
- At loading entrance to the kilns is a shallow water drainage ditch. The ditch needs to be redone with steel grates heavy enough to support a loaded forklift in order to minimize jostling the units being placed into the kilns. This will keep the units straight and uniform, minimizing sticker movement and sticker hang up.
- Air drying is a common practice used to get the moisture content lower in the lumber before dry kilning. There should be an air-drying yard established so that all the lumber being air-dried is stored in one place. Proper yard setup is essential to minimize the air-drying time and limit inventory. The FPL handbook describes this process in detail, and a copy is available for reference.

- The forklift loading and unloading the dry kiln should be equipped with the ability to side- sift allowing for properly nested units end-for-end.
- An inquiry should be made with the company that built and installed the dry kilns regarding a module for storing dry kiln data, so that each kiln charge can be monitored and historical data collected. This would provide valuable information for developing drying schedules for various thicknesses of lumber; and, if they sort by heart and sap wood, particularly from larger logs.

Tuesday - 9/27/05

Wood Combine: Regressed and spent time with WC management discussing recommendations made during the last months of the KBS project. Since Wood Combine was one of the original KBS project “pilot companies”, KBS team had provided suggestions for operations improvements, many of which have been implemented since 2004, and several that are still relevant in their present status of retrofit.

1. Increased production capacities through product diversification
2. Maximize log yield
3. Log size was to be 30 to 70cms with the average between 40cms
4. WC would process solely beech logs with end product to be dried and sold into the furniture and construction industries. They also intend to process lumber through a secondary manufacturing facility, already installed, producing various wood elements for a wide array of uses.

Recommendations at the end of 2004 were:

1. Debarking and bucking of logs prior to being fed into sawmill for further processing.
2. Band mill type processing for primary and secondary breakdown of inbound logs.
 - a. Primary sawing (headrig) to meet the parameters stated in item 3 above.
 - b. Secondary sawing (resaw) to meet the end product requirements.
3. Engineer a waste removal system to handle all fall down material that is not utilized in end products.
4. Installation of a modern board edger and cant edger or a piece of equipment that would process both specifications. This installation would depend on volumes based on end product demands or volumes being generated at the headrig.
5. Installation of a multiple blade trim saw prior to material exiting the building onto the green chain (lumber sorting area).
6. Installation of a stacker to be placed at the end of the green chain to stack and sticker lumber in preparation for air-drying to be followed by kiln-drying. The idea is to handle the heaviest volume of lumber produced in a direct production line rather than taking this material to another processing station. (There are automated bin sorters that work in tandem with trim saw operations, minimizing labor, by dropping the graded trimmed boards into bins designed to hold the exact amount of lumber to be fed into the stacker located at the end of the sorter. This type of installation is very expensive and the recommendation was to install the stacker at the end of the green chain.
7. Installation of a stacking / sticker station to prepare the remainder of the lumber coming off the green chain for preparation for air-drying / kiln-drying.
8. Installation of a modern saw filing room to build and maintain steel bands tipped with Stellite to minimize kerf loss and improve sawing life on the bandmills (Stellite is the current industry standard because it is easier and less expensive than carbide tipping) .
9. To improve the secondary manufacturing process currently in operation it was suggested they;

- a. Install a finger jointer of a higher capacity than what they were currently using.
- b. Improve the edge gluing operation from the current practice, using a traveling clamp to a batch RF (radio frequency) type or hot press gluer to improve edge gluing quality and volume.

Began working with the sawmill superintendent and key operating personnel to review some basic sawmilling techniques. Over the next several days we spent time in seminar-type discussions and then continued out into the physical operation environment, for hands-on illustration and to insure a clear understanding of the technical data presented. A synopsis of the data presented is included in Annex III of this report.

Wednesday - 9/28/05

Wood Combine: Continued discussion about previous recommendations for the facility, and reviewed some of the photos taken to illustrate additional areas for improvement, and worked again with key sawmill personnel reviewing basic sawmill techniques. The secondary manufacturing facility employs an outdated and highly labor intensive process, but is acceptable for current product requirements. This process should be modernized at a later date once product, production levels and markets are established.

Much of the recently installed equipment was sourced at Xylexpo Woodworking Machinery Show in May 2004, by this consultant, resulting in the purchase of several pieces of equipment and the recent request for a machinery presentation and quote by The Weinig Machinery Group.

Acting on recommendations during the previous project, some results to date are:

1. Installed a modern saw filing room for the manufacture of bands for both primary and secondary processing equipment. They also improved the equipment required to maintain circular saws utilized in the sawmilling process.
2. Installed a band head saw (primary log breakdown or headrig) - but they did not purchase a band mill meeting the original specifications. The mill purchased has a log size capacity considerably beyond those specifications and far beyond any requirements they need. The minimum log size is met, but the maximum log size is 120cms far exceeding log size currently available from any local forests. The additional expenditure for this purchase rather than a more optimal piece of equipment could have been allocated elsewhere in the operation. This type of capital expense is excessive and affords no benefit for the operation.
3. Installed secondary breakdown (resaw) for processing slabs and flitches produced at the headrig. This installation is adequate for sawmills designed to process hardwood lumber, but has severe limitations when utilized for softwood processing (the primary source for most of the construction lumber used in this region).

This is the point where the sawmill modernization has literally ceased, creating significant processing problems and inefficiencies. This will make development of a Quality Assurance program difficult, since much of the requirements for such a program depend on processing procedures and products to be sawn. The quality issues will be discussed, as appropriate, in step-by-step analysis of the current processing procedures. It should be noted that the processing procedures to be improved are directly related to the initial assessment and recommendations made during the original operational review done by this consultant during the KBS project.

Ukaj: Ukaj is considering buying one of the fully integrated SOEs to manufacture the engineered wood flooring product. The SOE is located in Decan, and has a sawmill, dry kilns and 85,000 sq ft manufacturing facility. The advantage would be that the infrastructure already exists, heating, electricity, blower systems, 3-stage panel finishing line and 2 other element finishing lines, several pieces of equipment that can be used for manufacturing engineered wood flooring. There are also several other pieces of equipment but not usable for making flooring that could be scrapped, sold or used for making other products. One of the larger rooms under roof is in need of repair due to a fire, but in general the factory is in good condition. The sawmill is a separate facility adjacent to this factory. The estimated replacement value for both facilities is around 8 million euros (just under 10 million USD) and they believe it will sell for around 10% of its actual value when tendered for privatization. It has not yet been assigned to any of the bidding rounds for privatization, mainly due lack of interest in the facility. He will contact KTA and make the determination to continue with construction of his building in Pristina or possibly pursue purchase of this SOE.

Thursday – 9/29/05

Wood Combine/Montenegro: Wood Combine management requested that we accompany Pajazit Tolaj on Thursday to visit the company Gornji Ibar in Montenegro and meet with Grboviq Vebo and Muriq Faket, production technologists, so that he could see the production layout they are using in their Dry (Rough) Mill. Much of the equipment, although older, is of the same type that has been suggested by the Weinig rep for their Dry Mill installation.

Before leaving for Montenegro, Agron Krasniqi and I discussed concerns over the apparent lack of direction in Wood Combine's planning. I told him that management seemed to have no focus or central direction for planning or production requirements, and the dual management approach (US/Kosovo) is difficult for the proper function of any operation, even those that are properly set up and operating. Argon agreed and will provide contact information for the US owners, suggesting I contact them directly to discuss potential resolution. He offered a copy of the EAR report prepared by Anders Olsen and clearly indicated the small log facility is not in their short range plans, and they would concentrate on secondary manufacturing – this information was relayed to COP, and we will begin focus on the engineered flooring manufacturers next week.

After touring the sawmill and dry mill in Montenegro, Pajazit Tolaj was of the opinion that the first discussions on last Friday with the Weinig rep regarding proposed equipment and facility layout were the appropriate approach.

Friday - 9/30/05

Wood Combine: Continued basic sawmill technique training sessions with key sawmill personnel – focused on headrig operator responsibilities (will be included in Annex III). There was an interactive Q&A session this morning, which is refreshing – at least there is interest in learning new concepts.

KCBS – Pristina: Traveled to Pristina to attend KCBS annual barbeque and met with Crimson Capitol consultants who will be setting up seminars for financial assistance to companies in the next month. Spent some time in discussion about Letters of Credit (LC) and export requirements for the engineered wood flooring producers – Burim will follow up to make sure Ukaj, Brovina, Korenica, Gacaferi and Wood Combine are included in these upcoming sessions. They are all interested in practical financial planning and preparation of business plans and financial statements for long term equipment financing.

Brovina and Ukaj: After returning from Pristina, we met with Afrim Brovina and Sheqer Ukaj to go over answers to technical questions about engineered flooring and some specifications received from SwedeCo. Due to the late hour, the discussion was to be continued Saturday at Brovina's office.

Saturday - 10/01/05

Brovina and Ukaj: Informed both principals of KCBS intent to offer assistance in pursuing the engineered wood flooring project, and to share additional information about costing and facility preparation from SwedeCo. Perlot has offered one of his facility managers from Samarinda, Indonesia as a technical advisor, once the facilities are getting closer to production status. This was a confidence builder for Brovina and Ukaj, who both have committed considerable time and are prepared to make substantial investments to see this project through to fruition.

Sunday – 10/2/05

Brovina: Discussing joint venture with Ukaj – cooperation between companies is not typically the custom in Kosovo, but these two companies have worked with each other over the years, specifically with the Industry Work Group under KBS, and as charter members of AWPK (Wood Processors Association in Kosovo), so they are aware that it may take collective efforts to enter the flooring market at a high production level. Gerald Perlot has offered to host Burim Meqa from KCBS, Brovina, Ukaj and Korenica for a visit to his Rung Ruang and Singha Paratech engineered wood flooring manufacturers in Bangkok, Thailand. This would be the most effective way to get a hands-on look at the production process, the product and the speed at which a high production manufacturing facility operates. Details of this impending visit will be forthcoming as the project progresses.

Korenica: I have discussed with Mustafe Korenica, the 3rd potential engineered wood products company, the potential for exporting louvered shutters – a product they are currently manufacturing, solid strip flooring from beech and other mouldings as potential export products. SwedeCo may be able to use his product line, or is willing to offer direct contacts for distribution to the US and European markets.

Monday – 10/03/05

Ukaj: Met with Sheqer regarding costs and product specifications for the wood flooring samples he was preparing. He had worked up material costs after our Sunday meeting and wanted to review that with me. He came up with an estimated cost of 12.3 euros per square meter excluding overhead or labor. All three companies are very serious about this opportunity and the production planning for this project will require detailed explanations – they are also very concerned about having no support after I depart the KCBS project on October 9. Some of the critical product, facility and operations questions sent to SwedeCo are:

- Can you estimate the average employee requirements at minimal, median and optimal production levels, based on Samawood's Indonesian operation?
- Since the dollar fluctuates dramatically against the euro can FOB factory prices be quoted in Euros?
- Will all shipping costs FOB factory be paid by SwedeCo?
- Can you provide an approximate cost for a one-pass finishing line as you described in your last e-mail - and do you have access to refurbished equipment Ukaj could purchase immediately?

- You specified 2 particular products sizes, but didn't mention wear layer species. Are they strictly oak or will seek maple and birch as well?
- If the wear layer species are oak, maple or birch what are the prices FOB factory?
- Will rotary veneer work for the wear layers particularly in the oak? They have access to rotary cut oak veneer from Southern Europe.
- Will 2mm cottonwood be acceptable for the backing?
- Is there any need for engineered flooring with beech as the wear layer? They have access to rotary cut veneer available from a local Kosovo source – this would be preferable.
- Can the lumber core be pine?
- They also have access to 10mm 5 ply cottonwood plywood. Would this be acceptable as core, and if so, how will it affect pricing?
- When do expect the need for the first shipments?

While at Ukaj, we were visited by the Director of a Decan SOE facility. We visited it with Sheqer last week, and he stopped by to ask if there was any further information he could provide that would assist the potential investors to purchase the facility. He is under the impression that a US company is interested, and during last week's visit there was no indication that Ukaj may be the potential purchaser. If Sheqer decides to buy this facility he wants them to believe that a US company is making the investment. The Director said he would provide me with a copy in English of the info package prepared for presentation to potential buyers.

Tuesday – 10/04/05

Wood Combine: Management has suddenly realized that what we have been addressing during the last week is of prime importance to their operation. They understand now that the sawmill can produce the small construction timbers from spruce and the beech squares by using an edger. They checked out an Italian made edger (it is a combination machine), at a cost of about 70K euros, to edge both boards and small timbers. They recognize now that the initial concept for the dry mill at a cost of 750K euros was a better approach over more than doubling the cost of the dry mill to handle the beech squares. So the conclusion was that beech and spruce timbers can and should be produced in the sawmill. So they are finally listening – and perhaps with continued assistance they will start coming up to speed.

One thing of interest discussed today was the seasonality of timber harvesting with an explanation. They don't harvest beech from May 1st until the end of September, because when the sap starts rising into the tree during the spring, the wood becomes very wet and causes significant drying problems, primarily severe checking. This is the traditional period or season for sawing spruce. Now I understand why the system they use is in place – with the use of more sophisticated drying equipment and procedures, this might change in the future.

Wednesday – 10/05/05

Ukaj: Burim and Sheqer started with a review of material and operating costs for flooring. We have discussed total capital investment for the flooring project giving consideration to the Decan facility. Sheqer says the Decan facility will not go up for privatization until June 2006 at the earliest. Prior to 1989 the sawmill, furniture plant and forests were all one company. After 1989 the furniture company was separated as one. Now there is confusion as to the legality of the separation and formal requests have to be filed with KTA, the Board of Directors and the company in Sarajevo before such a

separation can be accomplished. This was an issue in the earlier days of privatization, and obviously the privatization process still presents some challenges for potential investors.

Based on the information from the KTA regarding the date this facility may be available for tender, Sheqer has decided to continue with his building project in Pristina. Like so many other manufacturers, he can't afford to wait for the delays in the privatization process. In reviewing the costs and projected net profit Ukaj still has many questions about the size of this investment. Such a large investment in time and resources is a difficult concept to sell in a business environment geared for short-term gains, and he is very concerned that once I depart the KCBS project, that they will be unable to complete the engineered wood flooring project without my technical expertise and direct contact with SwedeCo. KCBS needs to provide intensive financial planning assistance focused on long range planning and profitability – subsistence manufacturing is a thing of the past.

Wood Combine: Today we began discussion of NHLA (National Hardwood Lumber Association) grading rules. NHLA grading rules are used for primarily all hardwood lumber produced in the US as well as for imports. Effective December 2004, the EU recognizes the NHLA grading rules and is using these rules as the standards for European exports to the US. NHLA grading rules are the most recognized by furniture, cabinet and other hardwood users as the “Standard for the Industry”. Thus, hardwood lumber imported into the US is expected to meet or exceed these rules.

These grading rules were discussed with the management in detail, and a current copy of the NHLA Grading Rules was left with them as reference material. It takes 14 weeks of training to get a fully qualified lumber inspector, and that requires either attending a certified school or bringing a certified trainer to the facility to proctor a certification class. They are not ready for discussions of this type yet – they need to get a clear understanding of the manufacturing concepts, and decide on a marketable product line, before grading rules will have much meaning. The material they are manufacturing at present is sold into the local market with little attention to grade requirements. Once the Agency for Standardization is established and begins to set norms for construction, the grade rules will come into play. This is an area for future project attention by KCBS, but will require more than 3-week intervals. NHLA has certified grading instructors available in the US; and, although the European Hardwood Export Council (EHEC) adopted the NHLA standards in December 2004, any certified grading instructors they may have, are available only to EU member countries.

Thursday - 10/06/05

AWPK / Gjakova: Met with Arjeta Vula, AWPk Director and spent several hours helping her to prepare the USAID grant application for AWPk, that was apparently due to be submitted the following day.

Ministry of Forestry and Agriculture: Burim received a call from Faton Sadiku, Forestry Department / Training Advisor, from the Ministry of Agriculture and Forestry. He evidently learned that I was in Kosovo and working with Wood Combine, so he traveled to Peja to meet with me. Faton was interested in my assessment of the state of the wood processing industry and Wood Combine's level of development. I told him the industry was under developed and the local market unsophisticated – advised him he should contact USAID for copies of industry assessments completed by members of CHF, FAO and KBS project which would give him a more complete overview and sub-sector recommendations from the perspective of several industry specialists – albeit the conclusions are much the same in each case. To better understand Wood Combine's

level of development, it was easier to go back to the facility and walk him through the operation step by step discussing necessary improvements and training needed. As far as training, the major problem is the lack of management skills and technical operations knowledge of the industry.

Knowing I was getting close to departure, Mustafe Korenica contacted Burim and asked to meet with me at my hotel around 8PM. He apologized for not spending more time with me this trip, but that he was busy traveling and had just returned from Montenegro. During the conversation he told us he was planning to bid in the upcoming tender for privatization of an SOE with operations in Rahovec and Xerce. It was a PVC pipe operation with the Xerce facility a 10,000 m2 under roof, rail service and container loading/off-loading facility. His plans are to put all his operations under one roof and lease out the excess space. We discussed the engineered flooring and its export potential and he seemed very interested. When he returns from Bulgaria he will contact Burim to get all the information.

He has a background in manufacturing solid strip flooring and has explored the engineered flooring product. He is currently buying equipment to make engineered wood scaffolding, something that was discussed during the KBS project, and remarked that the two products have similar processing requirements. The one exception is that the core for the scaffolding must be edge glued vertical material, where the flooring does not have such a requirement.

We discussed other products that SwedeCo had interest in importing to the US, which include, louvered window treatments, solid strip flooring, wood mouldings, engineered flooring tiles, just to name a few. Mustafa was very interested in the potential revenue, and indicated he would find a way to produce whatever wood product SwedeCo required. He also wanted to know when I was returning to Kosovo and I told him that had not yet been determined, but Burim would stay in contact.

Friday – 10/07/05

Ukaj: Visited with Sheqer to go over additional questions about manning and to discuss whether I would be returning to Kosovo to spearhead this engineered wood flooring project. I reassured him that I would be working from the US with SwedeCo and all three Kosovo producers regardless of my USAID project status. While at Ukaj, Burim received a call from Wood Combine asking about our plans for next week's visits – they had apparently forgotten that my involvement with this STTA was ending October 9, and we told them I would leave all the data we had collected and discussed with Burim for follow up activities.

KCBS / USAID – Pristina: In Pristina for a meeting with USAID to discuss my activities and progress with the STTA. KCBS COP and several USAID staff members were in attendance, including David Leong, Deputy Chief of Mission, and Dardanne Peja former CTO for the KBS project, with whom we worked in 2003-2004. This was not only an overview of the STTA, but an interactive session with considerable discussion about the potential for engineered wood flooring exports.

David Leong was impressed with the potential volumes involved and the fact that these products could generate 2-3 million euros per month in revenue – ***He also observed that using the higher number in those revenue projections would indicate that this project has the potential to more than double the current export output for all of Kosovo.***

I detailed my hands-on team approach, best-practice training and facility and operations recommendations proposed, with only 9 months of implementation time at KBS and two 3-week STTA's with KCBS, as the driving force behind the successes realized with the half dozen companies we addressed; including nearly all building larger facilities, purchasing additional equipment, additional job creation, and some doubling or tripling sales.

When David Leong posed the question of whether or not a year of intensive assistance would benefit these companies, my response was affirmative, and qualified by pointing out that these few companies are very close to being able to export on a large scale, and that other USAID projects could use them as primary examples of how working together with other companies in the same or ancillary industries can benefit all concerned and lead to the development of a sound manufacturing base in Kosovo. These are savvy entrepreneurs with a thirst for updated management and operations know-how, and we have an obligation to help them see this project through to fruition.

The USAID Information Officer took pictures and asked that Burim and I provide specific information on some of the success stories with Kosovo wood processors, which are detailed in the Conclusions and Recommendations section of the report.

Saturday - 10/8/05

Brovina / Ukaj: Met with Afrim, Sheqer and Burim for the last time during this STTA assignment, and went over some last minute questions regarding the engineered flooring. I assured them I would be in constant contact with them even after returning to the US. I will be traveling to SwedeCo's office when I get to the US, and we will review all data gathered during this STTA, and try to establish a timeline for bringing this product to market. These companies will need constant technical assistance throughout their preparation for production – this is a foreign process for them, and they are in desperate need of a “follow-the-dots” guide and a lot of expert hand-holding to make this project a reality.

Sunday 10/9/05

Returned to US, and with a lay-over in Vienna, scheduled a meeting with a Weinig Machinery Group rep to discuss the production line equipment Weinig would propose for manufacturing engineered flooring, based on SwedeCo specifications and current financial investment capacity of the Kosovo producers. I am particularly interested in any difficulties they would foresee in shipping highly technical equipment from Germany or Austria into Kosovo (i.e. logistics, customs or VAT issues).

TASK FINDINGS

To summarize the complexity of the sawmill industry in a short paragraph would be like explaining aerodynamics on a post card. What from the outside appears to be a simple manufacturing process, (i.e. cut down a tree, pushed it through a saw, and generate lumber), is in fact, a highly technical and sophisticated industry affected by macro and micro economic factors that must be constantly monitored so the business can respond to change effectively. Major factors influencing sawmilling include adequate forest rotation cycles and timber harvest plans to insure secure log supplies, properly designed and engineered production facilities utilizing continually updated state-of-the-art equipment, environmental, regulatory and power issues, constant training for professionals in management, operations, maintenance, sales, marketing, logistics and continual analysis of raw material resources and product lines to maintain long term profitability.

The financial capability to build a mill equipped with the best and most updated machinery is only the starting point. The sawmill operations in Kosovo are not only equipped with outdated production machinery, but the most important resource - their people - sawmill employees from management on down to the laborers, lack the sophisticated technical knowledge, years of experience and general operations expertise to efficiently run a high production facility. A few years of theoretical technical assistance from industry experts will only scratch the surface of what is required to bring Kosovo wood processors up to the level of even a small to medium sized sawmill operation in the US. Continuing education is a requirement for most professions, and sawmilling is no exception. New production processes are developed, updated and computerized machinery requires skill set training, and trades like saw filing and headrig operation take years of specialized training and hands-on apprenticeship to learn how to “read” equipment, logs and lumber. As mentioned earlier in this report trades such as millwrights, saw filers and sawyers are more of an art than a profession, and that skill is not something that can be learned from a textbook or a 2-week seminar.

Many wood processors in Kosovo still have, at best, a rudimentary understanding of basic principles of manufacturing and without continuity in assistance from one or more experts with a practical technical knowledge of manufacturing, these companies learn bits and pieces, but are never able to get a start-to-finish grasp of the entire manufacturing process from raw materials acquisition through manufacture and delivery of the end product. When afforded a continuous period of focused hands-on support from an industry expert, these processors are eager to make necessary improvements and they show remarkable results. My hands-on team approach, best-practice training and facility and operations recommendations proposed, with only 9-months of implementation time during the KBS project and two 3-week STTA's with KCBS, have been the driving force behind the successes realized with the half dozen companies we addressed as “pilot” or “model businesses”. Nearly all of them have built or are building larger facilities, purchased additional equipment, created additional jobs, and some have even doubled or tripled sales.

These few companies are so close to being able to export on a very large scale. USAID projects should use these companies as primary examples of how working together with other companies in the same or ancillary industries can benefit all concerned and lead to the development of a sound manufacturing base in Kosovo. These are all savvy entrepreneurs with a thirst for updated management and operations know-how. We have an obligation to help these companies take advantage of a business opportunity that might not likely be offered again.

CONCLUSIONS AND RECOMMENDATIONS

In order to get the primary and secondary manufacturers up to speed, a source of continuing education needs to be established, either through use of local technical institutes focused on critical machinery and equipment training, on-the-job training at similar facilities in countries with sophisticated manufacturing methods, and through IVP (International Visitors Program) or World Learning Participant. With new technical concepts in play (i.e. computerized equipment, new processing methods, new product lines), and as these companies expand to meet increased demand, key operator training becomes a major concern. Access to additional training either provided by the equipment manufacturers or with donor organizations assistance is required. It is recommended, where applicable, that select key operators be sent to modern facilities for one or two week exposure to an operating facility in the US or Europe. In some cases, select individuals should be sent for extended training in selected specialties.

I would also advocate bringing skilled trade professionals from the US or Europe to conduct facility-centric training in industry best practices. The areas most critical to sawmill and secondary producers of products like engineered wood flooring, furniture, cabinetry, etc. are:

- Training and certification of Sawyers, Graders, Saw Filers, Key Equipment Operators. For example, there is need for a skilled filer to work with the sawmill for a 30-day period, followed up by several similar sessions scheduled at later dates. This process should continue for at least a year or as determined necessary by the specialist involved.
- Training for Millwrights – for sawmill and secondary processing machinery and equipment.

This consultant has also opened discussions with a US hardwood lumber importer, on behalf of Wood Combine, for the potential of exporting kiln dried NHLA graded beech lumber products to the US. Further development of this opportunity will require outside training to certify graders skilled in NHLA rules. To train personnel and establish a grading system that would meet the US requirements would require 6 to 9 months of intensive training, including selecting and sending a capable individual to the US to go through the NHLA (National Hardwoods Lumber Association) inspectors training program. Once certification is achieved this person could train facility personnel, particularly the machine operators, in the basics of lumber grading. However, before a program of this nature is undertaken Wood Combine must complete the suggested improvements needed in the sawmill for this training to have any real value.

A wider range of continued specialized STTA assistance is needed for the more technical issues. As noted in this report, in order to sustain the momentum from assistance already provided - three week sessions every 3-4 months will not be sufficient to provide the intensive level of training required to gain proficiency in the skills currently lacking in this industry. Each of the companies assisted through KBS and KCBS to date have all requested continuous intensive hands-on assistance, not intermittent short term visits by an industry specialist.

- Continued technical assistance should be provided to improve understanding of log yield, as well as, revenue yields from sawn logs and resultant products. Currently, the whole process is end-product not raw-material driven. This shift in methodology will require a period of reeducation, because the concept is contrary to the former methods used, and the processors are simply not skilled in such an approach. They have no production or product analysis, costing or pricing

expertise. Currently everything is based on volumes – “cubes in and cubes out” - not on raw material and revenue yields.

- Hands-on and intensely focused assistance is needed at varying degrees to enhance current levels of management expertise. Particularly, in cases like Wood Combine's, where many of the investors involved with privatizing the former SOEs, have little knowledge of the industries in which they are investing; nor do the selected managers have the industry operations expertise to manage these facilities once privatized. Management skills need to be enhanced in the areas of:
 - High volume production management
 - Western accounting practices – practical financial, inventory control and cost analysis
 - Operations management and HR training
 - Preparation of professional level business and financial plans suitable for investment and/or applicable for capital equipment or operating capital loans
 - Marketing and product analysis
 - Supply Chain Logistics – centered on the export market
- Provide Quality Assurance training for a person in the sawmill, who could eventually work with sales and assist the head sawyer and sawmill manager in achieving maximum value; and to keep sales informed about log quality changes that could affect current or future sales revenue.

Engineered Wood Flooring.

The engineered wood flooring project has enormous potential. KCBS has the opportunity here to support the development of several wood processors who could sustain a new manufacturing sub-sector that would bolster the economy with the potential of 2-3 million euros per month in export revenue. The US importer is confident that these projections are not only realistic, but conservative, since their similar high production facilities in other global regions generate revenues significantly higher than those initially proposed for Kosovo.

Through this consultant's personal efforts from the US, work completed as a Business Development and Wood Processing Industry Specialist during both the USAID KBS and KCBS projects, and my 30-year business relationship with SwedeCo CEO Gerald Perlot, this project effectively affords these Kosovo wood processors a **“once in a lifetime”** chance to export into an existing global market that would normally take years of specialized marketing expertise to develop – this is an opportunity that must be explored to the fullest extent, and given a high priority for SME development assistance.

It cannot be emphasized enough that the revenue potential for the anticipated engineered wood flooring volumes could conservatively be 2-3 million euros per month. SwedeCo is confident that these requirements have the potential to support 4-6 companies producing engineered flooring and ancillary wood products for export to their US wholesale and retail distributors.

Employment potential increases with the introduction of new products to this region and the wood manufacturers producing engineered flooring (approximately 70 jobs with 2 facilities operating and up to 200, if the 4-6 companies are developed with this production level - potentially higher if the companies progress to a 2-shift operational status).

Further conclusions regarding the engineered wood flooring opportunity are made in Annex IV.

ANNEXES

- Annex 1 Company Contacts and Sites Visited
- Annex 2. Equipment, Machinery, Building and Product Specifications
- Annex 3. Quality Assurance Program
- Annex 4. Training and Reference Material presented to Wood Combine
- Annex 5. Engineered Wood Flooring
- Annex 6. Success Stories

ANNEX 1 – COMPANY CONTACTS AND SITES VISITED

Wood Combine - Peja:

Hysen (Hou-sen) Gecaj / Minor Owner (044-162-997)
Ahmet Zogaj / Accountant, Financial Manager (044-223-824)
Rexhep (Ra-jhep) Shabanaj / Sales & Marketing
Agron Krasniqi / Sales Manager (044-146-010)
Pajazit (Pie-az-it) Tolaj / Production Manager
Ismet Lekaj / Maintenance Manager

Gornji Ibar - Montenegro

Grboviq Vebo, Production Technologist
Muriq Faket, Production Technologist
Mark Culaj, President CEO of Apollonia (Engineering Consultants)

Association of Wood Processors in Kosovo (AWPK) – Pristina

Arjeta Vula, Director

Brovina – Gjakova

Afrim Brovina, Owner (+377-44-182-988)

Ukaj –Peja

Sheqer Ukaj, Owner (+381 39 180)

Korenica – Rahovec

Mustafe Korenica, Owner (+381 29 77 263)

Ministry of Agriculture and Forestry (MAF)

Forestry Department - Pristina

Faton Sadiku, Training Advisor (+381 38 211 817)

ANNEX 2 – EQUIPMENT, MACHINERY, BUILDING AND PRODUCT SPECIFICATIONS

In this section I have included lists of sawmill equipment proposed for Wood Combine in an effort to bring the retrofit to the next level. In addition, SwedeCo engineers have provided building, machinery, equipment and product specifications that will be necessary to begin the 6-8 month path to manufacturing wood flooring for export to the US.

This is a list of the equipment reviewed with Wood Combine management in addition to the equipment for installation of the proposed dry mill. Continued technical assistance should be provided to the management so that any change in their current operating strategy can be considered as the equipment comes online. They also need further sessions about the rationale behind these equipment selections so they understand how to purchase equipment that “meets – not exceeds” their needs, so they avoid spending money to over engineer their requirements like was done with the headrig installation.

At this point in their development, Wood Combine needs continued assistance in general operating procedures, industry best practices and in specific operator technical training.

The list of equipment and facility enhancement below was recommended considering the current level of operational planning skills. I have suggested equipment that would assist them increase production capabilities as well as improve lumber quality.

1. Improve log yard with an area specifically for receiving and scaling incoming logs
2. Debarker and bucking station; consideration should be given to allow enough room for a log grader to examine the logs before debarking in order to mark them prior to debarking and ultimately assist the sawyer.
3. Installing a slabber-chipper for making opening faces particularly on small logs would aid in sawing smaller diameter spruce logs.
4. Waste removal system with chipper inline for processing into material that can be used in boiler producing steam (currently using coal) to be used for kiln drying; and potentially producing briquettes with excess material produced from such an operation.
5. Board edger or cant edger, possibly a combination of both, with modern set and feed works.
6. Explore the possibility of retro-fitting the current resaw with a better power feed system to give it more flexibility.
7. Multiple trim saw with automated controls.
8. Drop bin sorter for sorting lumber by length and grade (this purchase is not required, but would minimize labor and increase sorting capability depending on the number of bins).
9. Semi or automatic stacker at end of green chain for more creating uniform units particularly for dry kilns - it would be less labor intensive than their current practice of hand stacking.
10. Forklift with side shift capabilities for improving dry kiln loading.
11. Replace current water draining system with a grated drainage ditch for easier forklift access in loading dry kilns, which would help in keeping lumber unit uniformity when loading the kilns.

ANNEX 3 – QUALITY ASSURANCE PROGRAM

A specific quality assurance program depends on products to be manufactured, equipment to be used and operational procedures. With all these facets still in question at this time a more general approach was taken to at least address the importance of such a program for Wood Combine. Quality control (QC) programs seem like an expensive process for mills producing dimension and specialty lumber until we realize that not only can the programs enhance product quality to the customer, but they can also help reduce costs by minimizing fiber loss in the milling process. The basic quality issues discussed and emphasized with Wood Combine are:

1. Proper storage of logs in the log yard.
2. Grading the logs prior to debarking indicating the best log faces lessening the time the sawyer needs to make a judgment about which opening face to be sawn.
3. Improving sawing techniques using the concepts discussed and presented in Annex III.
4. Measuring lumber after the headrig and at other stations more often to minimize and sawing problems that may have developed during normal operations.
5. Stop the practice of laying freshly sawn lumber on the floor in the mill or at the green chain.
6. Put bunks down where necessary when flitches or lumber have to be accumulated prior to processing.
7. Provide uniform sized stickers for green units for stacking either in the dry kilns or air-drying yard.
8. Stop the practice of employees walking on the flitches, lumber or cants at any time during the process.
9. Implement proper loading of dry kilns as discussed in this report.
10. Set-up an air-drying yard using proper procedures as described in this report.
11. Develop a good cross training program to assist in providing a continuous consistently produced product.
12. Since this process is not static, a well-trained person should have the responsibility in assisting management and operators to maintain and monitor a good QC program.
13. Implement an inventory control system to insure proper rotation of logs and lumber as well as monitor several aspects of production.
14. The sawmill is not properly setup to process the current products, since the original concept was to be processing hardwoods for furniture and other related products, not softwoods for construction materials. The softwood in the region is primarily spruce of relatively small diameters, 12 to 40cms with the average around 25cms, and low log quality with majority being grade 3 (lowest grade). This diameter range and low log quality are better suited for sawing in a small log mill specifically setup for this type of processing.

Terry Brown, Director of the US Lumber Quality Institute, is the recognized industry expert in the lumber quality control field, the editor/author of the book "Quality Control in Lumber Manufacturing", and has conducted quality control training programs for sawmill personnel in North America and around the world. This manual is the primer for sawmill quality management and highly recommended as a reference source for Wood Combine. It can be purchased in the US and shipped to the KCBS project for delivery to WC management.

ANNEX 4 - TRAINING AND REFERENCE MATERIAL PRESENTED TO WOOD COMBINE

The following technical sawmill training data was reviewed with Wood Combine sawmill personnel in seminar discussions and in the physical mill environment for visual hands-on training in an effort to improve operations. These sawing, edging and trimming techniques were discussed in detail, but to put into practice will take longer more intensive hands-on assistance since these concepts are new and unpracticed in Kosovo. To avoid information overload, caution was used in presenting these concepts, considering the lack of technical management skills and the difference in industry terminology. It would be extremely naïve to think that the techniques and concepts presented during this STTA will be put into immediate practice and be beneficial without continuous further assistance and training to reinforce the initial introduction to modern sawmilling.

Sawing, Edging, and Trimming

Sawing - the first process in the sawmill:

Although sawing was discussed earlier with WC, I reinforced this concept so it would tie in with the remaining processes to be addressed. This seemed to be an appropriate approach, since they are now sawing using a combination of sawing types; cant and live sawing. This practice has developed out of prior discussions with the sawmill manager relating to sawing for grade. He is working to improve the log yield and volume at the headrig, but most improvements are negated by procedures in use further downstream in the sawmilling process. The limited product mix being sawn severely limits the implementation of modern concepts of sawmilling.

The modern headrig sawyer is far more than just the individual who operates a piece of equipment to make lumber. This operator is one of those key operators for insuring that the highest recovery and profit is obtained in the sawing process. There are innumerable ways in which to saw logs processed in a sawmill. This includes variations in the initial saw cut (opening face cut), log rotation on the headrig, number of fitches sawn before rotating, lumber thicknesses, to name a few. There is a tremendous range between the worst sawing practices and the optimum which can result in as much as a 50% difference in lumber value and lower yields from the log.

There are special conditions in which deviating from good sawing practices are used generally related to higher values received from products requested by a buyer over sawing for standard products generally sold in the market. A knowledgeable QA person working with sales can assist the head sawyer and sawmill manager in achieving maximum value and keep sales informed about log quality changes that could affect current or future sales revenue. At present, there is no one in management or working in the sawmill qualified to fill a position of this type. Generally, this person is part of the management team, since they will be required to observe and instruct sawmill employees to assure best practices are continually being used.

One issue indirectly related to best practices and a good QA program is safety. Safety must be first and foremost on the minds of management and mill employees. An injury to any employee is very serious, but to an employee with key operator status, an injury could be extremely detrimental to continued quality processing and practices. Although it is an additional expense to the overall operations it is suggested that a cross-training program be established to insure depth in the skill sets needed to operate the sawmill on a continuing basis. A proper cross-training program takes a commitment on

management's part, good record keeping and a continual process to insure all the skill sets achieved are maintained to meet current processing and QA requirements. The lack of such a program could result in the sawmill shutting down or inefficiently operating if any one of the key machine operators are not capable of performing their jobs for any reason. This could have devastating results on lumber and value yields during their absence – however, with cross training these effects could be minimal.

Management should recognize that high yields and high profits are negated if serious injury occurs due to unsafe practices or ignored safety hazards. This is particularly important in a manufacturing environment where few safety hazards are properly addressed. Wood Combine, along with nearly every other operating manufacturing facility this consultant has visited in Kosovo, falls extremely short on this issue. It has been suggested that minimal safety issues should be addressed at this time relating to hearing and eye protection. These are safety issues that can be addressed immediately and at minimal expense. A safety assurance program in any manufacturing facility is as important or more so than effective quality or cross-training programs.

Some of the more obvious safety issues during this visit were observed and addressed along with hearing and eye protection but specifically:

1. Employees smoking while working; there are many fuel sources including flammable lubricants and solvents used in a sawmill for maintenance and clean-up. This practice could result in a devastating and potentially life threatening fire resulting in temporary or even permanent facility closure.
2. Lack of a safety shield for the head sawyer due to his proximity to the sawing operation.
3. Poor housekeeping that not only presents potential tripping hazards and other operational inefficiencies, but is directly related to increasing the damages caused by a fire.

These are just a few of the safety issues that need to be addressed at Wood Combine and it has been suggested that a "Safety Assurance" assessment be done by a qualified individual resulting in development of a "Safety Assurance Program" to meet their requirements.

The other issue that should be addressed at this juncture is directly related to the development and practice of any program(s) established for Wood Combine. The current knowledge base and skill sets at the management level are inadequate for the successful operation of this type of facility. Coupled with their current management approach of a "tri-director" leadership, one representing each of the 3 owners makes management decisions difficult. This is most evident in their overall lack of operations control and future development planning.

In discussions with the Hysen Gecaj, General Manager and minority share holder, he recognizes management's shortcomings, and is open to any advice or suggestions offered with the assurance that these would be given immediate consideration. When questioned about who was to be responsible for implementing such advice or suggestions given the limited knowledge base and skill sets? He had no response other than to assure me that progress would be made. With their marginal but positive response to date, it is still advisable for KCBS to maintain continual general business assistance, with frequent reinforcement of management and operations training.

To further the discussion on sawing it is important to understand that proper sawing practices require the sawyer to visualize the log on the headrig as having 4 faces

dividing the round log into four equal sections. Simplified this is mentally dividing the round log into quarters with a each round portion of the quarter representing a face.

The accepted practice requires positioning and sawing a log, the sawyer mentally divides the log's surface into four faces (sections). The faces represent one-quarter of the log's circumference and extends the full length of the log. The faces are established by the sawyer rotating the log on the carriage in order to establish the optimum relationship to defects on the log surface. Common practice is for the sawyer to determine the best face and place it into the knees then taking the first saw line on the opposite face. Once the first saw line has been taken the positions of the remaining faces are fixed.

Once the initial saw line is cut removing the slab from the log, the remaining flat surface of the log is also called a face. This sawn face is in alignment with the remaining log faces. At this point, with the newly sawn face exposed the sawyer must make a decision, based on yield and value (this ability is developed over time), depending on the defects exposed by opening this face. The size of the log may also determine what step is taken next.

Since they are currently processing primarily spruce, they are sawing for orders strictly to meet the requests for local construction materials use. Sawing small timbers and boards, they are producing cants at the headrig. A cant is a partially processed log, typically with at least two sawn faces, and often four sawn faces. Their current practice is sawing a slab and one or more boards to be made into lumber, with the goal to get one or more two sided cants from the center of the log. The cant thickness varies and is determined by the size of the log and the number of boards sawn from either face.

To increase production, I explained to the manager that in some cases a flitch - a partially processed piece of wood that needs to be edged and trimmed to make a piece of lumber - can be sawn thick enough (double or triple thickness) on the headrig to be resawn into several thinner pieces of lumber at the resaw (the next operations downstream). For their current product needs either a double thickness flitch of 55mm or 66mm, depending on the log size, to be split on the resaw, allowing for kerf, to either two boards of 26mm or two boards of 32mm. This practice would reduce the saw lines to be cut by the headrig resulting in processing logs quicker at this operation and ultimately increasing production from this work station.

A basic concept in lumber manufacturing is that costs (in this case euros per cubic meter) and profits are controlled by how much lumber can be moved through the "bottleneck" of the mill. A bottleneck can be described as the specific processing operation that limits the production capacity of the sawmill. Generally, in most sawmills the bottleneck occurs at the headrig, which is the case with Wood Combine. Lumber production cannot be increased or manufacturing costs reduced until the overall effect of the bottleneck is minimized or eliminated. In Wood Combine's case, minimizing the bottleneck at the headrig will actually create others down stream from the headrig. This issue has been discussed and will be addressed further as we progress in describing other processing operations in the sawmill.

I have stressed with the management that the goal of a sawmill is to make money, not just to saw lumber. The object for operating a sawmill is to maximize the profit to be sawn from the available log source based on existing sales, and thereby creating an acceptable ROI. The dilemma arises, since the market for construction materials is extremely competitive due to imports and the several hundred small log mills scattered though out Kosovo. These smaller sawmills have the same log costs, but with lower operational costs, making it difficult for the larger sawmills with higher overheads to compete, unless they have the capability of producing the same quality of material with

substantially higher production rates at reduced costs and can develop markets for the higher grades of lumber sawn from the logs being processed. Considering the current markets in Kosovo, it will be necessary for Wood Combine to develop a secondary manufacturing facility for processing higher grades of lumber produced into value added products to be sold locally or exported.

Two critical manufacturing concepts for a profitable sawmill are 1) placing the saw lines correctly, especially the line for the opening face; and 2) moving the log off of the carriage as quickly as possible to avoid creating an expensive bottleneck. It is imperative that WC incorporates these two concepts, as it is key in determining the financial success of a sawmill. This is one area that will require more in depth training.

Since the secondary band mill cannot process the cants currently being produced, they are sent through the mill onto the green chain dropping off the end to accumulate until sufficient quantity is available to load back into the mill to be sawn into timbers.

With the current sawmill equipment the sawyer has no choice but to rotate the log to the opposing or opposite face and cut his next saw line, requiring that sawyer to make additional saw cuts so that the sawn flitches can be processed downstream. This limitation also requires the 10cm cants to be sent the full length of the sawmill and accumulated at the end of the green chain so they can be returned to the sawmill for further processing at a later time. This practice results in additional saw lines or cuts to be taken at the headrig severely limiting production volume.

At this point the sawmill is not properly setup to process the current products, since the original concept was to be processing hardwoods for furniture and other related products, not softwoods for construction materials. The softwood in the region is primarily spruce of relatively small diameters, 12 to 40cms with the average around 25cms, and low log quality with majority being grade 3 (lowest grade). This diameter range and low log quality are better suited for sawing in a small log mill specifically setup for this type of processing.

Wood Combine's projected log mix is 70% spruce, 25% beech and 5% other species. With the projected cut 70% spruce and small diameters coupled with the low grade logs, the current operation will not operate efficiently which raises processing costs substantially. Since, the quality of spruce logs available in Kosovo is so low WC is exploring the possibility of importing spruce logs from Slovenia. They indicate that 40% will be grade #1, 55% grade #2 and 5% grade #3 with diameters of 30cms and larger. The purchase price of the logs is much lower, 65 euros per cubic meter, than the current 85 euros per cubic meter they are paying for locally harvested logs. The transportation for shipping by train and transporting from an unloading area will make the cost equal or a little higher than the local logs. The concept is that with the larger average size and higher quality logs, they will increase production lowering those related costs as well as increasing lumber quality (grade). However, this is only the first step of several needed to be taken in order to make this operation a viable, profitable venture.

Trimming and Grading:

- Trimming lumber.
 - Proper trimming decisions are essential in obtaining maximum lumber value.
 - Trimming is based on a combination of factors; prices, grading rules and sales.

- This concept can be difficult to understand since prices associated with grades may dictate trimming practices which go against established norms.
- For best lumber and value yields a grader should be placed before the trimming operation for the trimmer operator to trim the lumber correctly.
- To help maximize yield trimming should be done on one foot increments.
- As with all other processing stations in the sawmill the trimmer operator is part of a quality control program.
- An automatic scanner and computerized trimming system is by far the best solution for this station to avoid it being a bottleneck which happens in medium to large volume sawmills.
- **Lumber Grading and Tallying.**
This was one of the items to be addressed for this assignment. However, I was not advised that other species were to be processed and that Wood Combine had deviated from the original processing plans discussed, so I came prepared to assist them in establishing lumber grading rules to meet their existing market for hardwoods and to inform them of the structure for NHLA grading rules.

NHLA grading rules are used in primarily all hardwood lumber produced in the US as well as imports. The EU, as of December 2004, also recognizes the NHLA grading rules and is using these as the standards for European exports to the US. NHLA grading rules are the most recognized by furniture, cabinet and other hardwood users as the standard for the industry. Thus, hardwood lumber imported into the US is expected to meet or exceed these rules.

Headrig Sawyer's Responsibilities:

The headrig sawyer is one of the key operations in a mill and their responsibilities must be clearly defined. The primary responsibility for this operator is to break down the logs into lumber maximizing the mill's profitability by producing the highest grade of lumber possible in the shortest amount of time with the least amount of waste. This includes sawing cants or heavy flitches to be processed at other operations following the same concepts through the secondary manufacturing operations. At present the sawyer in Wood Combine's mill is restricted in his ability to use proper sawing concepts due to secondary manufacturing requirements. A reversal of product importance is necessary.

There are several basic tasks required of a sawyer that generally form the basis for training and future performance evaluation, and those discussed with the sawmill manager and head sawyer are: 1) loading and positioning of the log to be sawn as quickly as possible; 2) rotating the log to determine the grades of each face; 3) select which face should be the opening face; 4) select proper opening face size; 5) determine lumber thickness that will be sawn to maximize lumber values; and 6) decide when the log should be rotated and to which face rotated.

With the bark still on the log, the sawyer's current practice is to take an unusually heavy slab in an attempt to minimize the damage done to the saw from foreign materials, primarily dirt and rocks imbedded in the bark due to logging and log yard handling. This problem would be eliminated if debarking of the log was being done prior to sawing. They have tried to minimize this problem by using a hand held low pressure-washer hose similar to those used for washing cars in Kosovo. This process can clean off surface dirt and rocks, but will not remove rocks imbedded during the logging operation. This practice has helped some to reduce the damage done to the saws, but not enough to reduce the number of saw changes they are currently experiencing.

After discussing the importance of debarking the log and the relationship to reducing saw damage, they have started the process of an employee debarking logs by hand as they enter the mill. Not the most efficient means to accomplish this task, but the obvious results were immediate resulting in the reduction of the number of saw changes. The saw filer also commented that the damage done to the saws was reduced and the filing was now more concentrated on sharpening saws rather than effecting major repairs. It was observed, however, that the practice of taking the large slab on the initial saw line has not yet stopped. This is primarily due to the products being sawn, which are mainly construction timbers. The boards generated from the flitches sawn are also being sold into the construction market with no difference in pricing. They are making an attempt to saw the higher grade lumber to be sold to furniture manufacturers, but the practice of taking a heavy slab on the initial cut reduces the opportunity for putting the higher grade wood generally found in this slab into finish lumber. Most of the wood found in the slab ends up as fire wood which generates only 25 euros per cubic meter - considerably less than the revenue that could be realized if the log was properly sawn for grade and yield.

Basic Sawing Techniques:

There are 3 major sawing techniques, live sawing, cant sawing, and grade sawing. Wood Combine has changed its sawing technique deviating from the accepted norm, live sawing, used by most of the sawmills operating in Kosovo today. The live sawing almost always produces lower quality and value lumber when sawing medium to higher grade logs. This technique produces higher volumes from the headrig, but does not make up for the loss of lumber value particularly in higher grade logs. Live sawing is potentially profitable, due to faster sawing times, only with lower grade logs which would produce low grade lumber no matter how they were sawn.

Wood Combine is currently using the cant sawing technique in the attempt to saw the higher grade boards, producing higher value yields from the log, but sacrificing some of the potential yield to produce construction timbers. Until they improve the manufacturing process and seek out markets that can use higher grade material, they will continue to sacrifice value and profitability to meet the current construction market demand. Additional operations training is needed to help them understand the concept of value yield and profitability relating to sawing techniques, log quality and ultimately ROI.

There are several advantages to cant sawing, but due to machinery limitations downstream from the headrig most of the advantages are negated. Cants or heavy flitches can't be sent to the secondary breakdown saw due to its manufacturing limitations relative to the products they are currently sawing. Several capital equipment investments are needed to eliminate the bottlenecks currently present at the headrig and secondary breakdown saws. I have discussed with them that a more modern board edger and cant edger or a combination of both machines is needed to eliminate the current bottlenecks. They also need to invest in transfer conveyors for more efficient movement of cants and flitches between operations.

The other sawing technique I had hoped to discuss with them is grade sawing. However, there is a great deal of grade identification training needed before they would be able to fully optimize this technique. This technique is simply sawing the log on the opening face until the high grade flitches are removed, and then rotating the log to another face, then another until all high grade flitches have been removed from each successively sawn face.

As explained, grade sawing is the most optimum method for developing the maximum volume of high grade lumber and maximum value from the log. The problem with this approach is that the local market is not structured to recognize the value of this method.

This is the reason the original concept of sawing beech lumber graded for value to be sold in markets that recognized or demanded such practices for high value added products found in the furniture and other related industries was recommended. In addition, beech is the primary species readily available for processing and now has global acceptance in the furniture and ancillary product industries.

The beech logs available for sawing in Kosovo are of medium to high quality with adequate diameter. These logs generally have medium to high grade faces, and grade sawing is the method that can produce the best financial results when the log is properly sawn. This approach will require aggressive marketing to locate the markets demanding such higher end products. The US is a potential market, since they are currently importing graded beech lumber from Europe. The European market has somewhat different grade requirements, but still should produce higher values than can be achieved from supplying local markets or exporting into adjacent countries. Before the US market can be approached they must be able to show they can meet the demands required by such grades.

To train personnel and establish a grading system that would meet the US requirements would require 6 to 9 months of intensive training, including selecting and sending a capable individual to the US to go through the NHLA (National Hardwoods Lumber Association) inspectors training program. Once achieved this person could train facility personnel, particularly the machine operators, in the basics of lumber grading. However, before a program of this nature is undertaken Wood Combine must complete the suggested improvements needed in the sawmill for this training to have any real value.

Other concepts discussed in detail were areas needing improvement in their operation;

1. Log Loading: Improving preparation practices for logs entering the sawmill. Logs with excessive crook, improper limbing (branch stubs left by not removing limbs flush to the log), excessive butt flare can become handling problems in the sawmill delaying log processing. Improving log preparation problems before the logs are feed into the sawmill will increase production with minimal added cost.
 - a. The sawyer must load the log onto the carriage quickly and efficiently depending on production requirements.
 - b. Improved production can be achieved if each time a log is loaded onto the infeed conveyor the butt end of the log is even ended in the same location each time for loading onto the carriage. This will reduce the time used for positioning the carriage correctly for log loading.
2. Log Orientation: Positioning the opening face giving consideration to defects
 - a. The sawyer should position the log for the opening face considering the location of surface defect indicators so that these indicators will be placed on the edge of the flitch and potentially removed during the edging process.
 - b. To improve productivity and sawing practices it is suggested that the log grader pre-mark the log indicating the faces prior to debarking. Having the faces pre-marked will reduce the sawyers to process time, since he will not need to spend time turning the log to make that decision. Sawing speed is important but the major improvement will be the increased lumber value produced when sawing medium quality logs which can be as much as a 20% improvement.
 - c. Defects located away from the ends of the log and further down on any of the faces are far more important than those near the log ends. Such defects have large effects on grade determination, and proper face placement is important.
3. Opening the proper face as it pertains to log yield.

- a. Optimal Log Orientation: Defects should be located when possible towards the edges of the faces. By doing so, most of the defects will be positioned on the edges of the flitches when sawn, potentially being edged off to increase the grade or value yield of the produced lumber.
 - b. Proper face positioning can affect profitability by as much as 20%.
 - c. Many log defects are impossible for the sawyer to see after debarking because interior defect indicators are removed during this process. This reinforces the concept of having log graders mark the faces prior to debarking.
4. Log Sawing with Taper Settings.
- a. The process of skewing the log on the carriage so that the saw will travel the desired path during sawing.
 - b. There are three types of taper-set options used:
 - i. No-taper: most effective when sawing the low grade face
 - ii. Split taper: in sawing for grade this practice will keep the center of the log or pith from appearing partially on flitches sawn. It should be noted this option should not be used when sawing medium or high grade logs.
 - iii. Full taper: when the desired opening face potentially will yield a high-grade flitch the full length of the log.

5. Cant and Heavy Fletch Sawing.

These are taken directly from the headrig to the resaw for further processing in an attempt to eliminate the bottleneck that generally occurs at the headrig. This concept was discussed and we even tried running an un-edged cant through the resaw, however the feeding mechanism on the resaw cannot handle cants or fletches over 10cm in width. The equipment is under powered and is not designed for such purpose. This is just another example, as is the headrig and carriage, of management's lack of industry knowledge and experience. Had the proper consulting follow-up been done after the initial discussions with Wood Combine management in mid 2004, these costly mistakes in plant design could have been avoided. Based on their current production plans the small log mill, suggested by Anders Olsen, FAO consultant, might very well be installed and producing. This is one example where had the proper continuity and follow-up between the two USAID programs, KBS and KCBS, been done, Wood Combine may have been in much better position today to be the "Shinning Star" for the industry. Fortunately, these errors in judgment on Wood Combine's management's part can be corrected to a degree depending upon which way their sawing program is directed in the future.

Further discussion about this concept should be continued at a later date once the corrections are made in the sawmill machine centers, adding the equipment as suggested during this STTA.

6. Edging Lumber and Fletches.

- a. It is important to note here how critical edging is in a sawmill. In a mid-sized sawmill over edging can result in up to several hundreds of dollars a day in taking unnecessary saw kerfs. This is why many US sawmills have gone to optimized edgers to eliminate these costly losses.
- b. Mill management should determine if optimizing to a specific grade rule requirement is the appropriate objective. A sawmill producing lumber for its own furniture or cabinet shop would benefit by developing their own edging rules for this purpose. However, if they intend to develop lumber to be sold into a specific market perhaps optimizing is the correct approach. This is an issue that needs to be analyzed carefully in determining the proper operating procedures for the edger operator.

- c. There is potential for recovering clear material by practicing light edging at the edger. Using this lumber in a value added process, cabinet or furniture, can improve recovery in utilized properly in these types of operations.
- d. In export markets unedged or wane in lumber is very undesirable and a negative product attribute.
- e. A skilled edger operator with enough time to make good edger judgments with laser lines indicating the saw cuts and good infeed equipment will edge lumber to meet specific industry recognized grade requirements.
- f. Edgers should have random width capability. Fixed width edging will always result in the operator over edging the lumber.
- g. Edgers should be equipped with automatic networks with fixed width set capability.
- h. The edger operator needs to be trained to meet the edging requirements for any industry accepted grades. There are circumstances, particularly when edging wider flitches or boards where upgrading can be achieved improving the lumber value by increasing the grade recovery.

ANNEX 5 - ENGINEERED WOOD FLOORING

SwedeCo has offered to assist engineered flooring companies initially with acquiring some of the necessary components for manufacturing the product, such as veneer; which will initially be imported to Kosovo, but could become another product produced by local companies, given adequate assistance and training with facility set up.

SwedeCo has indicated that typically, it will take 6-8 months to get an engineered wood flooring facility up and running once all the preliminary ground work and planning is completed. This first 12 months is the most critical period for these manufacturers, and it is imperative that they be afforded a continuous level of intensive assistance during this start-up phase.

The engineered wood flooring interest has little chance to become a reality if a higher level of assistance over a continuous period is not considered. This would include sending Mustafe Korenica, Sheqer Ukaj, Afrim Brovina and Burim Meqa from KCBS to visit and observe SwedeCo's high volume manufacturers Rung Ruang and Singha Paratech in Bangkok, Thailand. This approach was suggested by SwedeCo CEO, Gerald Perlot and he has assured us that it is a viable option. In addition, he has committed to sending his Operations Manager from Samawood in Indonesia to work with the Kosovo companies when they get close to start-up for production.

SwedeCo will also assist this consultant in developing further contacts for other products suitable for potential export to the US and Europe and may be able assist in the development of this market.

SwedeCo CEO, Gerald Perlot has indicated that he is prepared to pursue further development of this resource in Kosovo only if this consultant is involved from the beginning for several reasons:

1. They are confident in my level of expertise in secondary manufacturing, international facility and product development history and my level of commitment to a project;
2. My close working relationship with these Kosovo producers and comprehensive knowledge of their facility capabilities developed through sector assessments and direct assistance provided through the USAID KBS and KCBS projects since 2003 – and my willingness to commit to USAID for another year in an extended sub-sector specific development program in Kosovo;
3. Since there is an existing SME development project in Kosovo with a SOW that includes assistance to the construction materials/wood processors, and SwedeCo is a US corporation with specific interest in Kosovo producers, USAID should be willing to support efforts to develop an industry sub-sector that will benefit both the US importer and the Kosovo manufacturers by offering at least one year of continuous sub-sector specific assistance.
4. Since SwedeCo produces for a high-end market, at least a one-year intensive hands-on operations assistance program, coupled with SwedeCo's offer to make available key training resources, could insure that these manufacturers have adequate opportunity to develop facilities capable of producing a high quality engineered wood flooring product for export into the North American markets.

Once the pipeline is opened for exporting to the US through a major importer such as SwedeCo, a sustained development process will take place with the continuous direct assistance from USAID sponsored projects. Getting these companies started is the primary objective – however, a program of continued education and general business assistance should be offered, possibly through local professionals, so these companies can maintain their market edge.

E-mails: Content Detailing Project, Facility, Equipment and Product Specifications and Projected Export Volumes

**E-mail communication sent to Martin Wood, COP KCBS – August 2005
Explanation of Engineered Wood Flooring Project**

During the KBS project, I proposed the potential for exporting certain wood based products from Kosovo to the US. A US manufacturer/importer, I have worked with for many years, expressed some interest in the opportunity, at the time, requesting profiles for companies with the capability for exporting to certain retailers in their US client base, such as Home Depot, Builders Square, and Lowe's.

The KBS Wood Processing team developed and provided profiles for a dozen client companies that we felt met the criteria. This US company has now selected Korenica, Ukaj, and Brovina as companies of interest and wish to further explore their manufacturing capabilities. I have also discussed the developments at Wood Combine and their potential for exporting lumber and other components, and based on my recommendations, this US firm will also visit Wood Combine. Having worked in this business for over 20 years, they have, however, expressed some concerns about the lack of "certified graded" Beech lumber for export into the US market, and I have shared some of the initiatives being explored by AWPK and several of the local processors with regard to certification.

This US manufacturer is fully aware that it can take up to a year to get graders trained and appropriately certified for the US market, and they have additional concerns about - 1) the lack of certified kiln dried lumber used in current elements and finished products, 2) no ISO certified standards where applicable and 3) no FSC certification for forests or wood products. As they have done in SE Asia and Indonesia, they are willing to work with companies that will meet the required standards leading towards these certifications, as soon as possible - this often includes assisting with machinery acquisition. The FSC certification will require government level involvement and several years to acquire, but they are confident that, if properly setup, the companies can provide appropriate ownership and certified materials documents until this is achieved.

After 2 years of preliminary efforts and my continued post KBS project discussions, particularly over the past 3 months, the CEO and President have finally committed to visiting Kosovo during my upcoming September assignment. They are arriving Pristina Monday, September 19th with plans to depart on the afternoon of the Wednesday the 21st. Mr. Perlot has requested that I schedule and conduct all the meetings due in part to my familiarity with the companies, their owners and the Kosovo region, but primarily because we have a 30-year relationship which includes work with several international manufacturing operations, and they are very comfortable with my level of industry expertise and knowledge of their product requirements. Their primary interest is with engineered flooring using several different wood species as "wear layers". In addition they would like to reintroduce solid strip flooring, a beech product eliminated several years ago due to the lack of sufficient quality products.

They currently import 50 to 75 - 40 ft containers of product each month for the US market, with the demand for such product on the increase. They also wish to hedge their imports from another region due to ever changing business and political climates in SE Asia and Indonesia. Their initial target is to import \$1,000,000 per month of engineered flooring, as quickly as possible, with other ancillary products in addition to that number.

They have indicated if initial shipments are timely, quality is excellent and costs are favorable, that they would expand their expectations for imports from the Kosovo region.

I anticipate their visit will prove to be very successful with end results to include long term commitments to local Kosovo wood processors for engineered flooring. I also expect they will have interest in other products; however, these may take a bit longer to integrate into US markets. They have also agreed to provide me with contacts and references for potential clients for products outside their area of interest in the US and Europe. This could prove to be a very powerful step in encouraging the wood processing industry to advance, increase employment and develop the "Made in Kosovo" product recognition.

The first step is getting the importer's interest, next and most important, an onsite review and then arranging commitments. I'm confident the companies selected will make a good impression due to their general attitudes, willingness to cooperate and to meet or surpass what will be needed to make this happen. This US principals are aware of the current development status of the Kosovo companies (considering their origin), after attempting to undertake similar programs in Russia, and are keenly aware of the special requirements that may be necessary to establish business links in this region.

My continual representation of these companies and marketing the concept of the untapped potential for the industry in Kosovo has developed the US interest to this point. My 30 year friendship and working relationship with Gerald Perlot, the CEO has helped, but believe me, they are no easy sell. Without our relationship, and based on this region's prior history and current status (which I also clearly presented to them) there would likely have been little interest. My persistence, the company profiles the KBS wood processing team developed, and their current product representation have convinced this US manufacturer to take a very serious look at Kosovo as a new resource base.

I have tried to represent these companies and the region, without bias, so they can preview each one's potential with an open mind. Like me, Perlot has worked in lumber remanufacturing for over 30 years, and his knowledge with this product line is second to none. It will not take him long to ascertain the current status of the industry and which companies will best suit his needs. I can tell you now, based on past experiences with Perlot, that his main concern will be their ability to make the jump from their current production and quality levels to those needed to export products to the US on a consistent basis. The competition is extreme in this business and second best will simply not be acceptable.

He has asked about the KBS and KCBS projects and how they support such endeavors or ones like it (this has helped to promote his September visit), and to be honest I have not been able to make him fully understand the somewhat disconnected approach to assisting such a potentially viable industry (i.e. STTA every 3-4 months - rather than consistent long term efforts which, of course, would be the private industry manufacturers logical approach).

**Letter of Interest from Gerald Perlot, Chairman/CEO, SwedeCo, Inc.: July 2, 2005
Details product requirements for engineered wood flooring and other components
from Kosovo producers**

Hi Matt:

Sorry I haven't been able to confirm our dates for visiting Kosovo. We are working to make a July visit - however there are still so many parts to this venture/our interest - I am trying to get the other interested parties all in sync.

Essentially, I see strong potential for Kosovo in several areas...

- a. The purchase of Beech Hardwood Lumber for producing our blocks that we make into Wear Layers for our 3-ply engineered flooring.
- b. The purchase of Beech Hardwood Blocks (ready for resawing into the Wear Layer thicknesses of 4.0mm and 3.0mm).
- c. The purchase of Beech Moldings - T-Molds, Reducer Strips, Stair Nose, etc. to complement our Flooring line.
- d. The purchase of Hardwood Flooring in several form factors...
- e. 14.5m x 190mm x 1820mm or 2090mm lengths as 3-Strip (Engineered 3-ply Sandwich Parquet) Planks
- f. 13.5mm x 90mm x 1220mm as Single Strip (Engineered 3-ply Sandwich Parquet) Planks utilizing local Beech as well as imported wear layers that we can have provided by our current lumber sources.
- g. 8.0mm x 72mm x 360mm Herringbone Pattern Flooring - solid Beech or as 2-ply Beech (Italian system).
- h. 7.5mm x 305mm x 305mm Assembled Wire-Backed Parquet Tiles using Beech (to augment or replace our current program for The Home Depot - which we currently supply made of Hevea (Rubberwood). (Typical Schroeder type system).
- i. 18.0mm x 64mm and x 90mm widths x R/L end matched Beech Solid hardwood flooring.
- j. Additionally, there is potential for Wall and Window Treatments (Shutters, Louvers, Blinds, Curtain Rods, Valence Parts, Shelf & Storage Systems, KD/R-T-A Furniture, Picture Frames, etc. out of local woods (Beech, Pine, etc.) that could be sold to various accounts we currently do business with such as The Home Depot, Target Stores, Costco Wholesale, etc.

I also have a flooring partner in Sweden who is interested in what we might be able to do from Kosovo.

Another consideration is that I plan to bring our President/COO, with me - as he now oversees our factory core in Indonesia, Malaysia, China, Singapore, Vietnam and Thailand and he would ultimately be involved with the order flow, QA criteria, etc. working with you on anything we did in Kosovo. He has to leave for the Far East in July and again in September - so we would make the Kosovo trip link so he could then go from Frankfurt on over to Kuala Lumpur.

Right now I am still shooting for the week of July 17th or July 24th - but if I can't cinch everything together by next week, I may need to change the trip to the week of September 11th. I don't like the delay - but if it is required - it could still work to our benefit. With an extra 45 days delay, I will have the time to equip you with a more

specific list of products we are interested in, as well as target pricing, etc. for Kosovo producers – I will also provide some hard samples. If we do have to delay until September, we'll all be better able get into greater specifics of what Kosovo factories can/or would like to do for us.

Sorry for the uncertainty and potential delays - but at least it is because of our high level of Interest in Kosovo - rather than because of a lukewarm or low interest in product from that region.

Have a Great Fourth of July - and please forward my sincere apology to your Kosovo partners - for my near term delays.

Best regards,

Gerald L. Perlot
Chairman/CEO
Swedeco, Inc.
www.swedeco.com

Additional communication from SwedeCo – August 2005
Detailing additional product requirements for Kosovo

Matt,

I apologize for the late response. I've been running ragged on both - personal & professional fronts!

The Good News is that my Merchant is now a consultant to one of my primary accounts - and I'm meeting with him next week to discuss the various products we can drum up out of Kosovo - as well as a major additional push in the flooring. As a consultant – he will have the freedom to open other doors as well. Just to let you know we WILL have the ability to make the KOSOVO initiatives a reality - and fairly quickly.

The other Good News is that as soon as I return from Atlanta, I've got one of the top two manufacturers of Solid Maple/Birch/Oak flooring coming to our office in Seattle - as they want us to put together an engineered program to match their solids. I will key that one specifically towards our Kosovo objectives. We've been talking back and forth for about 2 years...now they are apparently ready to pull the pin.

The BAD News - is I really don't think I can make the trip to Kosovo immediately...but again - I don't see why we can't just have you pull all of this together - and we can put the business on the table - and when they are ready to produce (after doing samples, etc.) I can accompany you. When they are close - I can have someone come over and work with their finishing line, etc. Somehow...we'll get the manpower available to help out. I just don't think I'll get to Europe until after the first of the year! Due to the points above - I will be able to forward you samples quickly along with projections and costing (though we'll stick very close to the spread sheet I already sent you.).

We would purchase using L/C's - so they should be able to use those for financing loans. I'm in the process of setting up a separate line of credit for this specific purpose. Korenica products would fit perfectly into my discussions with my Merchant. I'll open that door. Also we could do our flooring moldings there.

Keep up the pace...sounds like you are making good/timely progress.

Gerald L. Perlot
Chairman/CEO
Swedeco, Inc.
www.swedeco.com

SwedeCo Recommendations and Estimates – September 2005
Engineered Wood Flooring Processing Steps & Related Equipment Costs:

- Producing Wearlayers – Beech; Wintersteiger veneer machines(which you could buy for all "exotic species)
- Fabricating Core (which we could send to you initially - from Rubberwood - until you had full kilns/milling operations)
- Making Backers (which you should be able to buy locally or import - until you wanted to rotary peel or slice your own)
- Wintersteiger mini factory in-line machine that feeds Wearlayers/Core/Backer into a sandwich and laminates the blank
- Machine 1- In-line feeder (above) (Technically you can do with hand built Hydraulic or Air Bladder Cold Press you could make for around \$5,000 USD)
- Machine 2 - a 2 or 3-headed Sander for calibrating off of lamination (Buy used for around \$30,000 USD.)
- Machine 3- a used Moulder (Schroeder or equivalent) (Buy used for around \$65,000 USD.)
- Machine 4 - a used Tenoner (Torweggee or any kind that can have top/bottom/and 1-side cope. Can actually do with saws if accurate/heavy weight machine.) (Buy used for around \$65,000 USD)
- Machine 5 - Brush Cleaner/2-head Sander for pre-finishing sanding. (Buy used for around \$30,000 USD).
- Machine 6 - Stain/Filling Roller Coater (New for around \$20,000 USD)
- Machine 7 - I/R or Hot Air Dryer (steam or oil heat, etc. - for about 130F to dry filler/stain) Can be hand built. (Estimate \$25,000 USD)
- Machine 8 - Sealer Roll Coater (New for around \$20,000 USD).
- Machine 9 - UV Lamp (1 for first sealer drying) (New for around \$15,000 USD).
- Machine 10 - Sealer Roll Coater (New for around \$25,000 USD).
- Machine 11 - UV Lamp (2 for second sealer drying) (New for around \$20,000 USD).
- Machine 12 - 2 head sander for sealer sanding ((Used for around \$30,000 USD).
- Then run Lacquer over Machine 8
- Then UV cure on Machine 9
- Then run Lacquer over Machine 10
- Then UV cure on Machine 11
- Pack and Celebrate

You're at around \$350,000. Add another \$150,000 for contingencies. Add around \$100,000 for your utilities/hook ups/dust collection/etc., plus building. No reason you couldn't do it all in around 15,000 sq ft on a scale of about 250,000 sq ft/month on one shift - taking about 6-8 months of preliminary work to get there.

ANNEX 6 - SUCCESS STORIES

REAL RESULTS DUE TO HANDS-ON PROJECT INTERVENTION

Some examples of companies who have shown significant progress after less than a year of continuous assistance during the former KBS project are:

- Korenica bid, and in October 2005, won the tender for privatizing a former SOE that has operations in Rahovec and Xerce with 10,000 m² under roof. He will relocate both of his current operations, bringing them under one roof, and giving him room to expand to meet increased sales demands. He also intends to lease out any unused space to generate additional revenue.
- Ukaj purchased land on the outskirts of Pristina at a cost of 370,000 euros for 1.5 hectares and intends to build, a manufacturing facility in two phases, with 4320 m² under roof, and the final phase of administration offices and showroom, over the next 2 years to meet increased sales requirements.
- Brovina has expanded by constructing a show room on site at the Gjakova facility. Based on inquiries made on behalf of SwedeCo regarding other products of interest, Afrim Brovina is prepared to expand his current operation with additional building and machinery investments when this inquiry becomes a confirmed order.
- Wood Combined responded immediately to the hands-on assistance provided as covered in the SOW with:
 - manually debarking logs before sawing
 - changing sawing practices from live sawing to cant sawing in order to improve value/grade sawing over just producing low-end construction type materials
 - implementing better dry kiln procedures, producing in-house, better kiln stickers for more uniform packaging for drying
 - sawing heavy flitches (double or triple thickness) to increase production by making less saw cuts at the headrig and passing this requirement downstream to the resaw
- Wood Combine requested an analysis of the current sawmill operations and suggestions for improving practices or additional machinery investments that would enhance operations – A synopsis of the technical data presented is included in Annex III.
- Wood Combine requested my attendance at the meeting with management and the Weinig representative presenting a proposal based on their inquiry for equipment to install a dry mill (secondary manufacturing capability). My purpose was to insure that they would be considering the correct equipment options for such a project (A list of the suggested equipment is included in Annex II).
- Euro-Art, another company assisted during the KBS project has also built a new facility incorporating all the recommendations presented by the wood processing team in 2004. They are currently sourcing equipment to manufacture the standard type of wood flooring currently used in this region and would be an ideal candidate to manufacture wood tile flooring, another potential export product for SwedeCo.