



# SAVCOR

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# Recognising Talent



All companies are established to serve a purpose. Moreover, it is safe to say that all companies also wish to offer something that is unique; whether it is a service, a product or the way in which they are delivered to the market. Both of these statements ultimately aim at achieving competitive advantage.

Competitive advantage nowadays is only rarely about a single factor. Rather is the result of multiple factors such as knowhow, resources or processes. Competitive advantage is never stagnant, but rather requires constant maintenance or it becomes obsolete. Markets set their own requirements for competitive advantage; competitors and customers are nowadays global, which has given rise to an increased importance of supply chain management and integration in order to produce and deliver the offering to the customer. So in fact it is no longer enough to focus on the unique factors inside your own business. Focus must be also directed to suppliers, retailing and

logistics and other factors. Consequently, companies are no longer alone; they are seeking the best matches to co-operate with in order to strengthen and widen their competitive advantage. This all is actually to great extent about recognising talent.

Partnerships with customers and long term cooperation have always been part of the Savcor-way of doing things. Our take on innovation has always been that true innovations are always born only through the combination of solid knowledge base and customer's authentic need. Leveraging innovation therefore requires also risk taking and genuine trust between the innovator and the customer. In order to build and maintain that trust we spend a lot of time getting to know our customer's business and even our customers' customers' business inside-out. This is how we ensure our customers get the best solutions possible and that the development happens together. In addition to seeking good customer relationships, Savcor Forest has also actively sought after technologies that complement those of ours. This is something we wanted to share with you.

The following pages feature articles about our recent or on-going projects as well as long term customers. We also wanted to continue sharing our development projects, talking about what is new and feature some of our complimentary talents. Hopefully they illustrate the previously mentioned Savcor-way of doing things.

Savcor and Savcor Forest have spent

30 years in acquiring the level of knowhow and competence we have now. This is something we are proud of because being good at something deserves recognition. However, being good at something helps to also highlight the aspects that require strengthening although we know it is not reasonable to try and master everything. We believe in recognition of talent and working together with the best people and operators possible in order to create something extraordinary. We hope You share our belief.

Best regards,

**Jukka Rautiainen**  
CEO  
Savcor Forest Group

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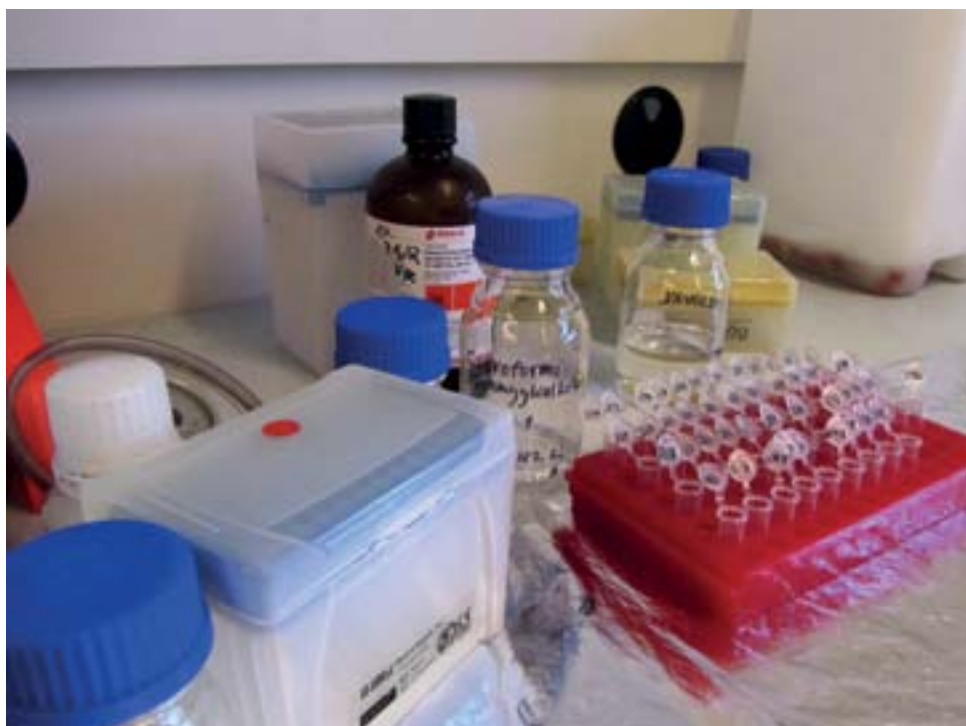




# QuantiFire – Modern microbiological services and systems

Completing Savcor Forest's range of Offerings

Marko Lauraeus, Product Manager, Savcor Forest Oy  
Anu Kettunen, Senior application specialist, Savcor Forest Oy



It is estimated that on Earth, there are about  $10^{30}$  microbes which exceeds all plant and animal biomass. In other words, microbes are present everywhere in high numbers and they adapt extremely fast to new environments and conditions. Therefore, microbes easily find their way to all kinds of processes, thereby causing contamination problems and productivity losses. However, man has also come up with numerous ways to utilize microbes, which we have become acquainted with in water treatment plants, biogas production and manufacturing of various fermented foods.

Microbial measurements, either for hygiene monitoring or quality control purposes, are problematic in many ways. The conventional microbiological methods which are based on microbial culturing are labour intensive, slow and often limited to few cultivable species. Due to these limitations, culture-based microbiological data are often neglected or are reached too late to prevent emerging microbial problems.

Molecular biological methods, especially the quantitative polymerase chain reaction (qPCR) are challenging conventional microbiological methods. The speed, accuracy, cost-effective price, high information content, reusability and automation potential of qPCR offer huge benefits to any modern microbiological laboratory. However, the implementation of qPCR technology to routine microbiological measurements, especially for industrial applications, has proven complicated due to numerous different methodological pitfalls. QuantiFire personnel has designed and implemented qPCR methods for



numerous industrial microbiological applications over 15 years and overcome the most commonly encountered challenges.

**QuantiFire has developed significant expertise in the following application areas:**

- Microbial quality control analyses of industrial processes and end-products, especially pulp and paper industry applications
- Microbiological analyses of foods, feeds and their production processes
- Microbial analyses associated to spoilage processes
- Pathogen detection and panels for virulence factors
- Assays for environmental monitoring, biogas production and waste water treatment
- Panels for human and animal digestive tract health

**QuantiFire provides many different means to help clients with their microbiological needs**

I. Analytical services. QuantiFire possess over 200 species-, genus- or group-specific qPCR assays for a wide variety of microorganisms. These assays can be applied to client samples of any kind on service-for-fee basis. At present, QuantiFire runs over 100 000 qPCR reactions for client samples annually. The analytical services are supported by a proprietary sample delivery and storage system, experience of various sample matrices, world-leading DNA extraction protocol and user-friendly reporting system.

II. Microbial measurement systems. When it is practical to implement our procedures to a client laboratory, QuantiFire carries out technology transfer projects for certain well-defined applications areas. The projects are tailored for each client, comprising of equipment purchases, method development and validation, hands-on training and setting up the required measurement system.

III. Assay development. QuantiFire bioinformaticians design customised assays for the quantification of any bacteria or bacterial group of interest. Developed assays are validated and tested against adequate reference libraries and sample matrices.

IV. Support and consultation. QuantiFire provides full support on any technical issues of microbial enumeration by PCR technology.

*Savcor Forest acquired QuantiFire in Spring 2012. The team of four specialists and their laboratory facilities will be relocated and merged with Savcor Forest Wedge-business unit located in Espoo, Finland.*





# Savcor Forest's New Customer in India

Renewal of Anodic protection system for BILT Graphic Paper Products Ltd. in Ballarpur



Metsä-Botnia's oldest pulp mill Kaskinen was built in the late 1970's when major investments were made in Finnish pulp and paper industries. Already in early 1980's the staff in Kaskinen found severe cracking in the impregnation vessel. Estimations on service years left rose only up to a few if no changes were made. Meanwhile Savcor had just been established in 1981 and owners Hannu Savisalo and Martti Pulliainen, after hearing about the problems in Kaskinen, were convinced that they have a solution. Despite the fact that the solution in question, Anodic protection system (AP), was in the level of theory, Botnia placed an order and the system was built and delivered. As anticipated, Savcor's system was able to solve the problem and the vessel was found corrosion-free after a year. This is how AP systems came on the market.

In early 2009 after more than 30 years of

production, Kaskinen faced shutdown. In many ways, due to history, this was also a meaningful end to one lifecycle in Savcor Forest. What we did not anticipate then, after the shutdown, was the new cycle of usage for the process equipment that would open in India.

**BILT Graphic Paper Products Ltd (BGPPL)** acquired the main process equipment of Kaskinen in autumn of 2010. Savcor Forest was contacted by BGPPL concerning the AP installations in impregnation vessel and digester and Vice President Matti Häkkinen met the new owners in Kaskinen while disassembly giving a background for the installations. Relocation of the digester and impregnation vessel to Ballarpur India was done in early 2011. Before shipping Savcor Forest carried out an inspection of the technical components of the vessel and digester revealing a demand for renewal in order to have full

functionality. After all, the AP system was installed already in 1981.

After a careful assessment BGPPL agreed upon the necessity of corrosion prevention system for the process equipment and real negotiation phase started between the two parties. As the new pulp mill was scheduled for start-up in end 2012, the conversations were highly professional and coherent right from the start, recalls Matti Häkkinen, who submitted the proposal for BGPPL.

He also met the representatives of BGPPL in BILT headquarters in Gurgaon, India towards the end of negotiations and year 2011. What characterised the atmosphere in the offices was diligence and activeness. Also the conversations carried out during the visit increased the level of high standards and expertise, which delighted Matti Häkkinen to great

extent. "It was clear through the whole process that I was cooperating with true professionals and we had a mutual understanding of desired outcome", concludes Häkkinen.

Parties reached an understanding right in the beginning of 2012 and Savcor Forest received an order to deliver a renewal for the AP system to Ballarpur, India. The technical equipment is shipped to the mill in March and installation and commissioning later during the year. Anticipation is high in Savcor Forest's project team. It is the first installation in India for us, so many firsts are expected, says Project manager Isto Virtanen.

Isto Virtanen and Tommi Ruuskanen, project engineer responsible for mechanics spent a month in India and saw the Kaskinen mill rising in front of their eyes on a sand field site that employed more than 3000 people. The two men got first-hand experience on local working culture, building techniques and way of life. During that month the temperature kept above +40 Celsius, which was the first significant distinction from our familiar conditions.

BGPPL and Savcor Forest set the installation duration at one month, which was achieved as planned. What characterises the local employees at the site are diligence, helpfulness and cooperative spirit, Virtanen and Ruuskanen describe. Work was done together and even after the long working days, the locals took time to help the visitors with every day technicalities, such as internet access.

Most memorable experience for Virtanen and Ruuskanen was the ceremonial blessing of the digester top before it was lifted to its place. "We were really honoured to be a part of this special ceremony; it gave us a true feeling of us all being colleagues and this is a shared project".

The installation project continues during autumn 2012 with electricity work for the prevention system. Ballarpur mill is scheduled for start-up in end of 2012.



Isto Virtanen and Tommi Ruuskanen with project colleagues from India and Sweden.



Participation in the ceremonial blessing of the digester top.



Isto Virtanen



Tommi Ruuskanen



# Pölkky Oy grows and develops

Jouko Virranniemi, CEO, Pölkky Oy

Jari Jokinen, Product manager, Savcor Forest Oy



Pölkky Oy, located in northern Finland, and Savcor Forest's crossed paths in mid-1990s. Savcor Forest supplied a basic ERP-system as well as wood procurement functionality for Pölkky's operations. However, right after the signing of this contract the two started to plan an extension into mill-level system. Three years later Pölkky became Savcor Forest's first Meka ERP- installation in February 1999, recalls Meka product manager Jari Jokinen. Drive towards development has been strong in both companies and therefore co-operation has continued until today.

Pölkky's persistency towards growth was again proven through a contract done with UPM-Kymmene, which published the ownership of Kajaani sawmill to transfer to Pölkky. The new owner started running operations from September on. New sawmill supports the raw material acquisition of its owners other sawmills and strengthens the division of work among them. Profitability and quality of further processing increase thanks to larger amount of inhouse sawn wood.

"Kajaani sawmill is a good supporter for our production concept based on high quality raw material from northern Finland. After this acquisition we are even more capable of serving our customer on domestic and export markets. Cost structures and operations model in Kajaani need to be brought

quickly to a level of profitable business", says **Managing Director Jouko Virranniemi of Pölkky Oy.**

End product markets are experiencing challenging times, but through efficient production, right cost structure and high quality operations we will be able to maintain our competitiveness also in the future. Wide market area, further development of the service concept and competitive Pölkky product portfolio will enable success also from here onwards.

Pölkky product portfolio and the service related improve through the new production capacity and division of products. What is required for developing further processing is competitive and profitable basic production of sawn goods. Pölkky has invested over 70 million euros in mechanical wood processing since the 1990's. Acquisition of Kajaani sawmill takes this development one step further again in the quest of competitive strength. Up to 70 percent of Pölkky's sales volume is exported in more than 20 countries. The domestic market will, however, continue to be significant. A year ago the company invested in a new glue beam production line. The continuous development and growth have raised the bar also for ERP systems. All Pölkky operations are driven through systems supplied by Savcor Forest. ERP system includes raw material purchasing

operations, mill receivings and operations including graphic warehouse management, vehicles, order-delivery chain management and production planning in further processing and glue beam production. In addition Pölkky uses a broader perspective Business intelligence- application that serves management through assistance in running versatile operations.

Pölkky is a customer that demands a lot, but we like it, says Savcor Forest solid wood team. High requirement level from customer side combined with supplier's industry knowhow is a combination that maintains development in software business now but also in the future. Over 15 years of co-operation continues, which at the moment means the planning work of extending the existing ERP-system in Kajaani mill as well. Prior to this, Savcor Forest systems have been extended into former Stora Enso Taivalkoski production unit and in Kitka, so both parties are very familiar with the requirements of ERP systems when operations grow.

*Pölkky Oy is a family business from Kuusamo in northern Finland. They have sawmilling and further processing operations in Kuusamo, Taivalkoski and Kitka in Kuusamo and a pressure treatment facility in Oulu. Pölkky Group's turnover rises up to 100 million euros annually and employs around 220 industry professionals.*

# ERP + Business Intelligence

Assisting managerial decision making

Matti Perämäki, COO, Savcor Forest Group

Savcor Forest has developed its own ERP system for wood procurement organisations and solid wood industry operators since the 1990's. The system has been developed on a continuous basis through customer feedback and changing industry standards. One of the newest additional applications for the ERP system goes by the name ERP+ Business Intelligence.

Business Intelligence is the process of systematic retrieval, recording, organising and analysing of business-related data. The application collects all relevant data from customers' systems and brings in front of the management in ready-processed form that assists decision making and administration of different aspects of the business. Immediate observation of data source deviation and processing of retrieved data are essential parts of the application that guarantee the high reliability of created trends. Updating of the data processes has been joined as a part of data retrieval which keeps the data flow in real time for decision making needs. Assisting decision making is in fact the application's main job.

Companies spend a lot of time and resources in data acquisition aimed at collecting all data relevant to steer the operations and different units as efficiently as possible. Data is handled and processed after which it is distributed to the stakes in need. Companies also engage in steering and monitoring of the data and its effectiveness at different levels of the company.

The biggest advantages of Business Intelligence are the real-time, ready processed operational data that replaces the traditional reports and uniform metrics throughout the entire



order-delivery chain. These qualities give also grounds to improved quality of information and its utilisation as well as standardised distribution and publishing methods while the general workload related to reporting declines.

## Future direction of Business intelligence

Business Intelligence- data and analyses can be expanded without limitations concerning data sources as they have defined technical boundaries. The core questions arising from projects are whether if we are able to find and understand all the relevant information, how to combine it with other correlative information and how to finally dress it in readable and clear data for utilisation. These are the reasons why the development of this application has required, and will require in the future, in-depth industry knowledge Savcor Forest highlights in many occasions. The models with complex backgrounds need to be able to bring clearly correlative data to the management. Future scenarios are clearly the direction of ERP+ Business Intelligence, in which the benefit comes from already collected business intelligence data and windows.

At the moment Savcor Forest's

Business Intelligence covers the company's self-created entities from raw material acquisition, purchase operations and multiple mill operations down to feedback information from the customer. Already a strong share of Savcor Forest's solid wood customers have adopted this application. The user group will, however, expand from management level to at least planning of sales and customer analyses. The future can be translated into company-specifics by saying that implementation of this application will inevitably change both the culture of recording and using data as well as operations models when using data for assisting decision making.

Concerning the written down and planned future development Savcor Forest would like to mention Versowood's and Luvian Saha's active participation in this development project. ERP+ Business Intelligence is the result of the solid cooperation of these three companies beyond compare! What characterises all Savcor Forest projects is the quest for professionalism, customer orientation, industry knowhow and responsibility for delivering quality solutions that match the demanding application setting.



# Pushing Wedge in North America

Savcor Forest starts an export venture with WetEnd Technologies Ltd.

Savcor Forest and another Southern Savo-based company, Wetend Technologies Ltd., have commenced a shared export venture to North America from September 2012-onwards. This venture will be undertaken in cooperation with the Finnish Ministry of Employment and Economy and Finpro. The honorary consul of Finland in Chicago, Olavi Göös, has agreed to take on export manager duties.

The main objective of the three-year venture for Savcor Forest is to boost the sales of the Wedge process diagnostics system and to form a more accurate picture of the North American market. Canada and USA have developed in to a very challenging market, not only due to size but also due to the business culture. "You have to be really active, outspoken and network like crazy", explains Göös.

The first step of the venture is to identify the market segments and companies within, and then we will build a clear operations plan for the first year. After that, it will be down to proper sales work. North America as a market has a very upbeat tempo and they have a

habit of being the first to adopt new trends, such as mobility, flash animations and social media. This is something that Savcor Forest hope to learn from and adopt during this venture.

The Pulp and paper industries are no strangers to Olavi Göös. He graduated from Helsinki University of Technology with a degree in Paper technology and industrial economics. After having worked for multiple Finnish companies in the industry he ended up, via Portugal, in North America in 2001 and worked for Myllykoski as a project manager in Alsip mills. After that he worked for Pöyry and a couple of American companies, residing in the States to this day. He started serving as an honorary consul in 2009. Göös has prior history with Wedge, which will prove to be a great advantage when commencing sales. Wedge product manager Mika Suojärvi has already demonstrated the latest version updates of Wedge to Göös, who was thrilled to see the development. "Wedge is a

genuinely good product and we should find the right audience for it in North America", he states. The market, customer research and operations plans that have been compiled will assist in determining whether corporate or mill-level will be a focus. Sales work at a corporate level greatly differs from the mill level, where people are interested in the immediate task at hand. When discussing at a corporate level a broader, long-term view is taken to the advantages that the system offers. After all, the product is a long-term investment.

The objectives for Wedge are clear; we will aim for three Wedge installations, which will provide an opportunity to develop a realistic picture of the market and its' potential. We expect that the venture will provide a strong reference case for the North American market. "I find these objective very realistic", says product manager Suojärvi.



Product manager Mika Suojärvi and Olavi Göös taking a look at the newest version of Wedge

# Motivation stems from Training sessions

Mika Suojärvi has been training Wedge users already since 1998

All Wedge installations we have done have included user training. It is really important to provide good grounds for software use and to make sure that the customer gets the full advantage of the tool they are starting to use, says Mika Suojärvi, Product manager of Wedge Diagnostics system.

Suojärvi is responsible for the majority of the user trainings Savcor Forest provides for Wedge installations. Once the basic training for the software is done and it has been used for some time, it is really common that the frequent users ask for assistance in more advanced features. Depending on the need, a member of our Process Analysis team is sent to give training. These kinds of requests tell us that Wedge has been in frequent use and that our customer is getting positive results from using it. From five up to more than 10 training sessions are held annually.

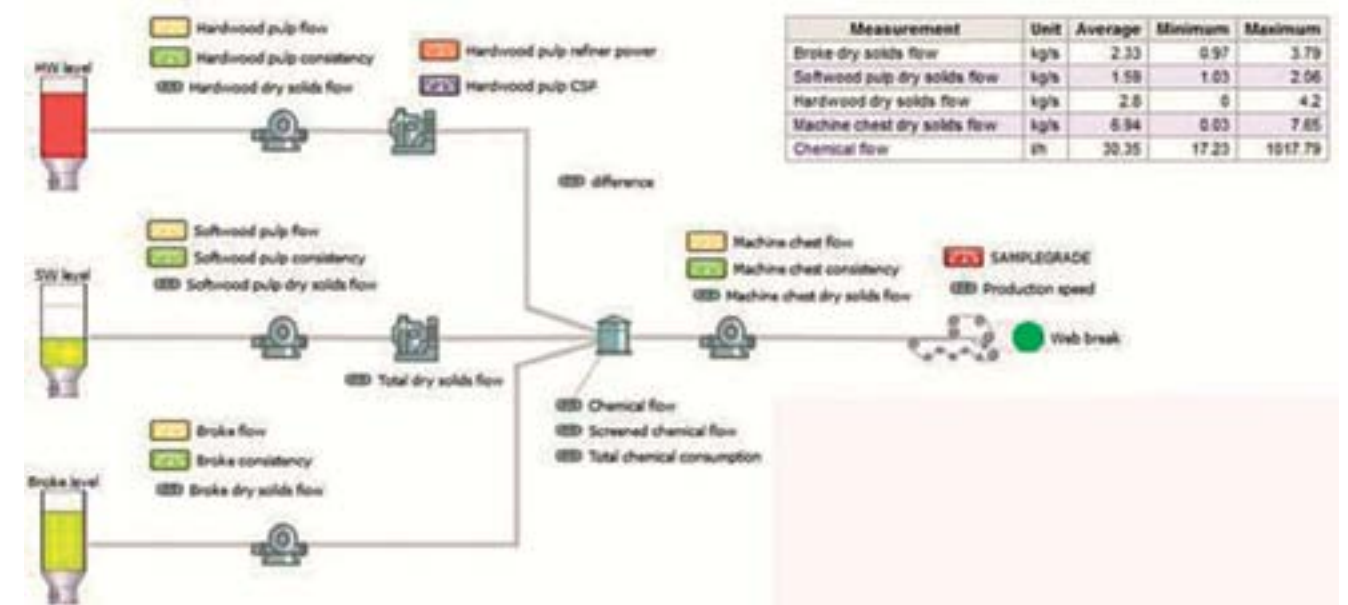
The most important thing our team collects from these training sessions is, however, the direct comments from customers concerning their wishes for developing Wedge. The idea of these

trainings is to see our customers using Wedge like in their daily work and see what the most beneficial features are and what are still lacking or should be added. These training sessions create a great platform for open discussion and brainstorming.

One active participant of Wedge training sessions is Johanna Keronen from Stora Enso Imatra mills, who has two years of active Wedge user experience. As a relatively new user Keronen has put effort in participating in training sessions actively as she feels they offer a lot and often give her some new insight of the functionalities and features. "We use real process data in the trainings, meaning the same data I work with every day, and therefore it is easy to transfer the examples used into practice and try them immediately after the training. I have also received good answers to the challenges I have faced processing the data related to my work and almost every time we have been able to find an easy and quick way to display something I have been after" she explains. These "smart tips" from training sessions have been easy to

transfer to my everyday work in addition to which she believes that training sessions activate Wedge users to reuse functionalities they were about to forget. Keronen is a member in a project team that develops Wedge functionalities and tools for Stora Enso together with Savcor Forest. "This development work is to great extent based on the customers, i.e. our wishes and needs. The final result will show how well Savcor Forest's Wedge team have been able to incorporate them but so far it seems promising", Johanna Keronen summarises.

Majority of Wedge trainings are held in Finland, but Suojärvi has been providing trainings also in Sweden and hosted online sessions to Germany and Brazil. Almost 15 years of training has not turned boring. "We get new users all the time, we develop new features and get direct feedback from our users- each training is different because the people are different", he explains. According to him the excitement and motivation of the Wedge-users gets him excited as well and motivates him to take the system even further.





# Growing money in Latvian Forests

Helping JSC "Latvijas valsts meži" (LVM) solve complex harvesting challenge

Andris Balodis, Director, Timber Production and Deliveries, LVM



JSC "Latvijas valsts meži" ("Latvia's State Forests") pursues state interests in forestry by sustaining and increasing the forest value, while gaining maximum possible value from forest management. Their total managed land area comprehending 1.62 million hectares and the forestry cycle from reforestation till final felling is 80 to 100 years. Harvest between 4 and 6 million m3 of timber annually from 12500 cutting sites and delivering it to close to 100 customer sites is a formidable challenge. There is a constant deficit of timber versus the demand. The problem is how to allocate the available timber to the customers to minimize the harvesting and delivery cost. In addition, the rapidly changing customer demand, logging and forest road conditions required frequent re-planning by several experts.

To reduce their delivery cost level and to obtain for better management of timber flow LVM awarded Savcor Forest a contract to provide a round wood harvesting optimisation system based on optimisation system based on a product by Remsoft in September 2011. Remsoft is a Savcor global partner specialising in forestry management optimization. The

project team consisted of LVM planning experts, Remsoft modeling specialist and Savcor project management. LVM's pursuit to be a leading edge forestry producer in streamlining their operations put high demands on the project and on the system. A special challenge was LVM's high amount of harvesting and delivery sites extending the optimisation run time. With a software update, the time dropped to a good level. The project went according to plan and the system was accepted to production in June 2012.

The finished "OPT" system has been used for full production since June. The results are even better than expected. Says **Mr. Andris Balodis**: "We can see already now a sharp decrease in delivery costs, smoother production and deliveries, better customer satisfaction and more motivated staff as they can focus on higher level optimisation instead of laborious routine planning. We are happy with our Savcor partnership and are exploring new areas to apply Remsoft's algorithm based optimising technology."

## ANDRIS BALODIS

- Forest Engineer, M.Sc from Latvia University of Agriculture, Forest Faculty (1987)

### - Work history:

Logging master in Liepaja Forest industrial company (1987-90),  
Logging master in "Silva" Ltd. (1991-1994),  
Managing Director in „MTC" Ltd. (1994-95),  
Manager of forest machine department in "MTC" Ltd. (1995-2002),  
Director, LVM (Latvia's State Forests) Roundwood Deliveries, (2002-2010),  
Director of Production and Deliveries, LVM Forestry, (since 2011)  
In 2007 elected as foreign Member in Swedish Royal Agricultural and Forest Academy for work in forestry section.





# Student cooperation

*Katri Liekkilä, Manager, Communications & Marketing, Savcor Forest Oy*

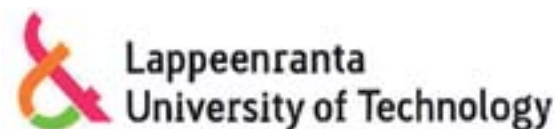
Savcor has deep roots in metallurgy. For decades, we have also applied materials technology, chemistry, physics and information technology through our operations. Successful application of science and the continuing development of expertise require thorough knowledge of the fundamentals and an environment that is conducive to processing and discovery. The role of 3rd level institutions in this work is vital and this is why Savcor has continued co-ops with institutions such as Lappeenranta University of technology, Aalto University and other universities of applied sciences.

Savcor Forest continues Savcor's traditional operations in the pulp and paper industries through corrosion prevention technology based on electro chemistry. In addition, Savcor have started analysis work on all continuous processes. In the solid wood business and the area of forestry the role of information technology in our solutions is crucial. The continued operation and growth in international markets necessitates attention to the areas of business management and commerce. The aforementioned factors have guided our interest towards education and student cooperation. In the previous year we have cooperated with Aalto University and their schools of technology and economics, Lappeenranta university of Technology and Mikkeli University of Applied Sciences. Participation has predominately been through lectures, projects and diploma work.

A great example of the successful cooperation with Lappeenranta University of Technology laboratory of green chemistry has been through an R&D-related project that has run for several years. The professor of the

Mikkeli-located laboratory, Mika Sillanpää, describes the relationship between Savcor Forest and LUT as close and trusting. He envisions the partnership continuing in the future, as both parties take a long term view to their work.

Another example of an ongoing student cooperation has been through the Mikkeli campus at the Aalto University School of Business. This small but active Aalto-unit offers a unique Bachelor's degree programme in business with a truly international environment and a strong entrepreneurial spirit. Savcor has visited lectures regularly for more than a decade, providing first hand experiences on the operations and challenges of a global business. Programme Director, Joan Lofgren, is pleased to have Savcor visiting the school and considers the experiences that visiting business managers share to be invaluable for the students. The real world application of theories is very influential in the process of learning. She also sees it as an opportunity for the school to give back to the community. "It is not always easy being an English-speaking school and



attracting local business people to visit. Savcor is a great example of a local and international business. Cooperating with them is our way of demonstrating that we want them to stay in Mikkeli", Lofgren explains. She also regards these visits as a good opportunity to promote career opportunities in Mikkeli, which may otherwise be overlooked.

Lofgren finds the challenge in Mikkeli for the school and local business cooperation to be the structure of the three-week study modules and ensuring authentic links between the guest faculty and local businesses. It is vital that the guest lectures incorporate all of the related parties; companies, lecturers and students. All in all, she is pleased to have seen the connections between the school, community and local businesses grow in recent years. A positive environment of cooperation has now developed in Mikkeli.

Savcor Forest's objective in cooperating with educational institutions is to reintroduce closer relationships with universities of technology as well as finding cooperation partners in our subsidiary countries.

# How to drive maximum value in Plantation Forestry

*Pasi Niemeläinen, Managing Director, Savcor Forest Inc.*



During the past several years the South American forestry sector has implemented technologies that enable us to manage not only the business processes but most importantly the living organism that underpins our industry, the forests.

As a matter of fact, the process of modernization has brought intelligence into the business and is intrinsically linked to changes in the global market. Today, large corporations with forestry assets in Brazil and other South American countries compete with powerful and equally resourced companies in other continents. In order to win this battle, it is of utmost importance to utilise advanced forest management information systems.

The best information systems in use today are the ones that integrate operational, managerial and strategic processes in a seamless manner. They cover the business processes all the way from genetic research and seeding production to harvesting and transportation. Many of the South American forestry companies have such systems in use and are benefiting from being able to plan and control their forestry operations.

The next logical step in driving maximum value from the forests is optimization. It is a fact that around 60% of the cost of wood comes from harvesting and logistics. This represents a cost base of hundreds of millions of dollars in large scale plantation

forests and is the largest single area where optimisation can produce massive cost savings. In practice with the help of optimization it is possible to gain savings between 5-10% during this stage of the process without sacrificing sustainable use of the forestry assets.

Work with genetic material is a fast evolving area of development that aims to produce the best quality of raw material for the production of pulp and paper. As the raw material demand of a pulp mill is driven by the paper industry and ultimately of the end user of the paper products, it is important to be able to react to changes in this chain. In practice this means that some genetic materials may quickly become obsolete and they need to be replaced by others that are able to produce the best possible fibre to meet specific needs of the end users.

Another example of driving maximum value in the plantation forestry comes from allocation of seedlings. Typically the seedling production in large scale operations is scheduled based on an annual harvesting plan. As always when we deal with nature, the harvested areas differ from the harvesting plan and this brings about a very challenging dilemma; how to allocate the already produced seedlings, with the aim to maximize the MAI (mean annual increment). Various parameters from genetic material to soil and climate conditions and operational costs among others need to be considered. If

done correctly, this is a process that offers possibilities for considerable gains in productivity.

Fibre is often the biggest factor affecting the cost and quality of produced pulp. Quality of fibre is in turn influenced by genotypes, phenotypes and operational conditions among others. When optimizing the entire forestry value chain we need to consider a complex network of macro environment, stand, tree and wood fibre level properties, pulp fibre properties, fibre networks and paper fibre properties. Eventually the value chain leads us to realize that it is the end user requirement that drives the entire process. This is where the ultimate challenge of value chain optimization lies; we must be able to consider that the end user requirements guide the industrial needs for certain types of fibre. This needs to be considered in the raw material procurement all the way from the genetic development and seedling allocation to transportation and chip mixing.

The South American forest industry has taken giant leaps in recent years in implementing technologies to manage their forestry assets. Seamless integration of robust forest management information systems and advanced optimization tools is a key to take the competitiveness of South American forest industry to the next level and to further increase our capabilities to compete in the international markets.



## Savcor Forest Group contacts

**Savcor Forest Oy**  
*Group Headquarters*

Insinöörinkatu 8  
FI-50100 Mikkeli  
Finland

Tel.: +358 20 774 774  
Fax: +358 20 774 7770



**Savcor Forest Inc.**

102-18940 94th Avenue  
Surrey, BC V4N 4X5  
CANADA

Tel. +1-604-662 7034

**Savcor Forest Limitada**

Av. João Guilhermino  
n°261, cj. 152 - Centro  
São José dos Campos - SP -  
BRAZIL  
CEP:12210 - 131

Tel. +55 12 4009-2609

**Savcor IT GmbH**

Chorherrengasse 3  
D-88364 Wolfegg  
GERMANY

+49 7527 915 0

**Savcor Forest**

Uppsala Science Park  
SE-75183 Uppsala  
SWEDEN

+46 70 556 7290