

UPM'S STAKEHOLDER MAGAZINE 3/2014

Biofore

TOWARD A
NEW INDUSTRIAL
REVOLUTION

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UPM – The Biofore Company

UPM combines bio and forest industries. We are building a sustainable future in six business areas.

In 2013, UPM's sales amounted to EUR 10.1 billion. UPM has production plants in 14 countries and a worldwide sales network. UPM employs around 21,000 people. UPM's shares are listed on NASDAQ OMX Helsinki. By the end of 2013, the company had 94,568 shareholders.

Think circular – think Biofore!

Value chain, supply chain, end-user.... After reading some of the main feature stories in this issue of Biofore you may well think that these currently almost over-used words have become altogether obsolete. And quite rightfully so.

Those established terms express the so called linear model which is embedded in most of today's industrial operations everywhere. The linear model – and mindset – is coming to an end. And the reason is simple: Earth's limitations.

A circular economy is a new paradigm. It challenges the traditional linear "take-make-dispose" economy. Even though the developments in the linear model have been impressive, in a circular economy the resources are kept in use for as long as possible, and finally they are recovered, recycled and regenerated into new products and materials.

According to Johnson Yeh, Associate Director for Environmental Initiatives of the World Economic Forum, circular economy may be the start of a new industrial revolution (see pp 10–13).

We at UPM welcome this! We have been advancing towards a circular economy for many years. UPM's Biofore strategy aims at efficient utilisation of resources and has given rise to several sustainable innovations that replace non-renewable raw materials with renewable, biomass-based materials.

Moreover, our product development is based on lifecycle thinking with ecodesign. Here the environmental impact and resource efficiency of the product is assessed throughout the lifecycle – starting from the design stage all the way to the end-of-life solution.

Today yesterday's waste is tomorrow's resource. What will happen to this magazine after you have read it?

Elisa Nilsson
Vice President,
Brand and Communications, UPM



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UPM set

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global biodiversity targets in 2006 and reaffirmed those targets in 2011 to guide the development of individual country targets and local level forest tract actions plans.



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UPM's global biodiversity targets guide the company's forestry operations worldwide. Following the targets ensures we have a healthy forest, the primary focus for professional foresters at UPM.

In a circular economy, products, at the end of their use, can be re-used, re-manufactured, recycled, or go back into the biosphere so that we can use the resource on earth over and over again.



30 Nobody knows for sure whether the platform that you read from really matters. But – the more technical our world becomes, the more we long to be touched. Paper speaks directly to your senses.



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30 PAPER LOVED BY HUMAN SENSES

Believe it or not, the type of media and the reading method matter. Different media invoke different kinds of sensations, and the more senses triggered, the better the human memory works. Even in the current world of state-of-the-art technology, we increasingly need something to touch: paper.

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In November, UPM was honoured to host The Royal Swedish Academy of Engineering Sciences (IVA). As patron of IVA, His Majesty King Carl XVI Gustaf of Sweden participated in the event.

MORE WITH BIOFORE



UPM leads the integration of bio and forest industries into a sustainable future characterised by innovation, responsibility and resource efficiency. www.upm.com

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PHOTOGRAPHY JANNE LEHTINEN



ISABELLA CABRAL EXHIBITION OPENS BIOFORUM FOR ART

The Bioforum in UPM's head office Biofore House is open for all people and all ideas and topics. This comes naturally for a venue located right in the heart of Helsinki at the Kansalaistori square, close to the future location of the new library building. It is also logical continuation to UPM's role as a patron of arts.

Bioforum will be the address for seminars and events presenting UPM's innovations advancing the bioeconomy. What's more, it is also an exhibition space for art. Isabella Cabral's exhibition "Worlds apart, united in wood" was the first art exhibition to be staged at Bioforum in Biofore House.

Isabella Cabral (6.6.1958) is an artist born in Sao Paulo Brazil. She has divided her interest in both art and architecture. After studying and working in Sao Paulo and Paris she found herself in Finland. She also found new subjects for her art.

The exhibition at Bioforum presented two series of masterfully crafted oil paintings from two different corners of the world, Brazil and Finland. Quite aptly for an exhibition at the Biofore House, the objects of the paintings in both series are pieces of wood!

UPM BioVerno receives Finnish Key Flag Symbol

UPM's renewable wood-based diesel UPM BioVerno has received the Finnish Key Flag Symbol, which can be granted to products that are manufactured in Finland and have a domestic origin degree of over 50%.

UPM BioVerno fulfils these criteria with flying colours – it's produced in Lappeenranta, Finland, and most of the crude tall oil raw material comes as a by-product from UPM's Finnish pulp mills.

According to various studies, symbols like the Key Flag have a great impact on consumer purchase decisions, as many consumers are increasingly interested in the origin of products they buy.

UPM BioVerno will be available within the next few months as the bio component of regular diesel fuel in the Finnish service station chains St1 and ABC.

**You can now read
UPM's Biofore Magazine
and many more interesting
articles related to the innovative
Biofore business on our
new digital publication at
www.upmbiofore.com.**

UPM's profitability objective achieved ahead of schedule

UPM's strategic investment projects, which are designed to enable growth, are progressing as planned.

Renewable diesel production in UPM's biorefinery in Lappeenranta, Finland, is set to begin in the last quarter of the year.

In the Pulp business, the expansion of the UPM Kymi mill is progressing on schedule. The investments made in wood-free speciality papers and label materials in the UPM Changshu mill in China are also advancing according to plan.

The total investments in these projects amount to EUR 680 million, with EUR 238 million already invested by the end of September. The goal of the growth projects is to improve UPM's operational results (EBITDA) by EUR 200 million.



UPM BIOVERNO WINS SUSTAINABLE ENERGY AWARD



UPM's renewable diesel UPM BioVerno has won the European Union's Sustainable Energy Europe Award 2014 in the "Travelling" category.

The European Commission chose the best European sustainable energy initiatives that promote energy efficiency, renewable energy and lower emissions in traffic.

The competition jury appreciated the innovative way UPM uses tall oil residue from its pulp manufacturing process as raw material for the advanced biofuel.

In addition to reducing greenhouse gas emissions, the production of UPM BioVerno supports the local economy and improves energy self-sufficiency.

The award winners were chosen in June by a jury that consisted of representatives of European communities, local governments and the energy industry as well as specialised industry associations and media.

This year a total of 342 projects from 31 countries took part in the competition.

UNIQUE INNOVATION

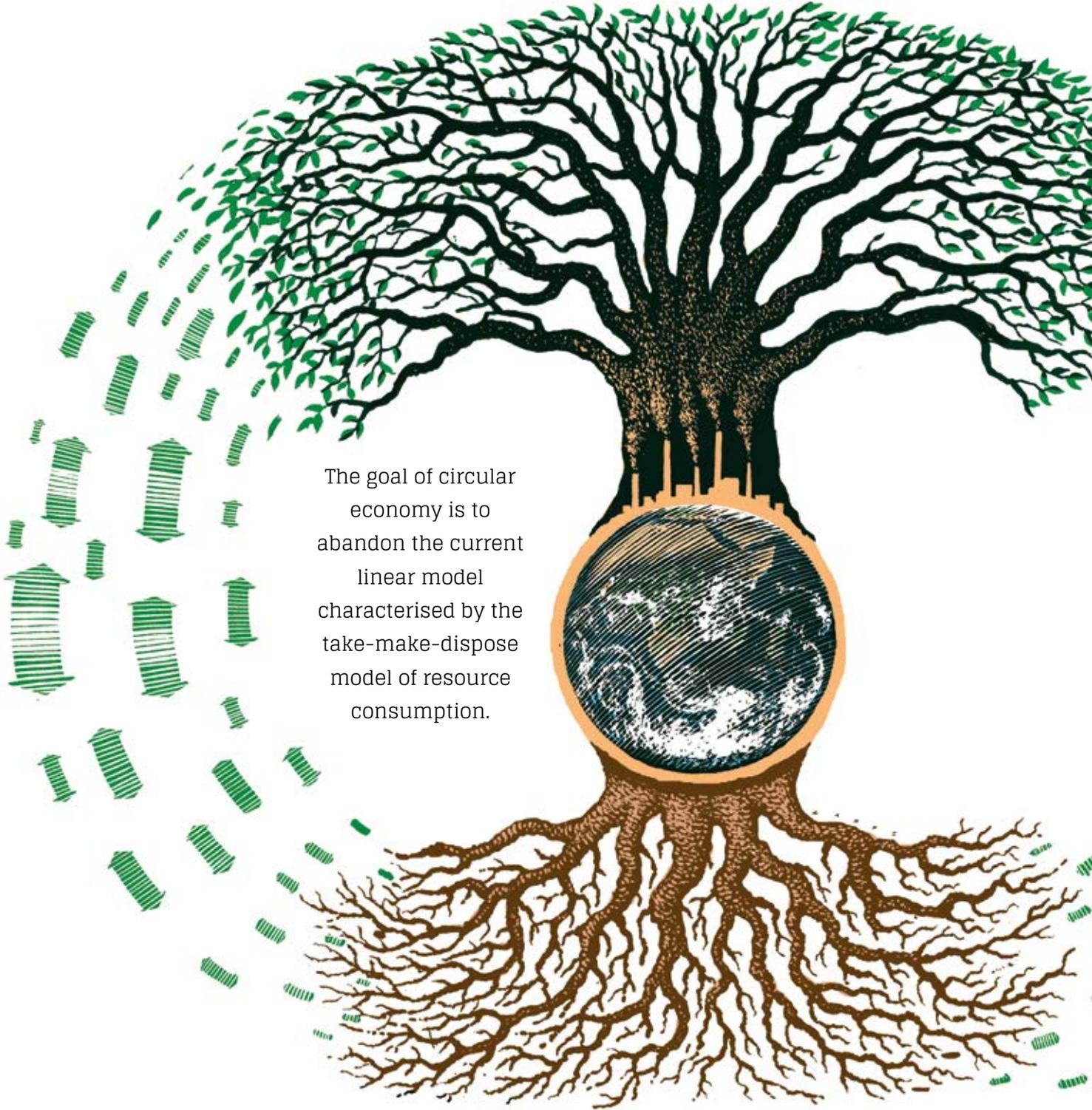
UPM BioVerno is a Finnish invention developed at the UPM Research Centre in Lappeenranta.

It is a high quality wood-based renewable diesel made from crude tall oil, a residue of pulp production.

It is similar to traditional oil-based diesel, and fully compatible with all current diesel engines, for example in cars, buses or trucks.

UPM BioVerno reduces the greenhouse gas emissions of transport by up to 80% compared to fossil fuels.

UPM's commercial-scale biorefinery in Lappeenranta produces approximately 120 million litres of renewable UPM BioVerno diesel annually.



The goal of circular economy is to abandon the current linear model characterised by the take-make-dispose model of resource consumption.



TOWARD A **NEW** INDUSTRIAL REVOLUTION

In a circular economy, products, at the end of their use, can be re-used, re-manufactured, recycled, or go back into the biosphere so that we can use the resources on earth over and over again.

It is also a new paradigm of growth that can allow profitability and economic growth, while spurring job creation and innovation.

Johnson Yeh, Associate Director for Environmental Initiatives of the World Economic Forum, believes that the circular economy may be the start of a new industrial revolution, since it is based on using our resources more efficiently.

“A circular economy is an excellent business model of the future, and it is being promoted by the development of the internet of things as well as increasing awareness regarding risk management for resource inputs. The model offers a solution for limited resources and increased structural unemployment while innova-

tions promote equal economic growth,” Yeh says.

Several factors have made the circular economy successful on a global scale. The global population will increase to 8.3 billion by 2030. The consuming middle class will amount to 3 billion. Raw materials will become scarcer, prices will increase and price fluctuations will be more pronounced.

The change will also be driven by the development of technology as many internet services enable the sharing, trading and tracking of products. In addition, consumers are starting to understand the benefit of access over ownership. Instead of wanting to own things, they opt to use commodities by renting or borrowing them, which is in turn a big driver for circular economy.

“Mature markets also need local jobs and local growth, which means that labour-intensive activities – such as maintenance and re-manufacturing – provide excellent opportunities. We are currently at a transitional phase where the first challenge is proving to businesses that this model will provide growth and benefit them.”





Johnson Yeh

“I believe that the circular economy will be based on new innovations and business models created in the US, political changes to be implemented by China in the long term and the excellent awareness of the circular economy among European companies and consumers.”

–Johnson Yeh



The EU alone could – by promoting the collection and recycling of resources – reduce the material needs of its member states by 17%, increase economic growth and create 1.4 to 2.8 million new jobs.

Guided by limited resources

The emerging markets in Asia are developing and industrialising at a fast pace. For example, the GNP of China has increased on average 7.5% per year. Such fast changes require a lot of raw materials, water, energy and food. Limited resources and increasing fluctuating prices drive China towards the circular economy too.

“China is the world’s largest factory and the world’s most important manufacturing country, which means that its economic growth is based more on industrial manufacture than a strong service sector. Regardless, I believe that services of the circular economy will become China’s key strengths too because it has a good political vision geared towards the long run,” Johnson Yeh says.

Unlike other Asian countries, China has promoted the circular economy with legislation since 2009. Still, the awareness of consumers and their position as part of the industrial recycling chain are still being developed.

“The Chinese government has, however, realised very well many other changes, such as the symbioses of production facilities in industrial areas and ecological cities with infrastructures that are very well suited for the circular economy,” Yeh adds.

He is of the opinion that a transition to the circular economy requires close cooperation between the three major industrial regions.

“I believe that the circular economy will be based on new innovations and business models created in the US, political changes to be implemented by China in the long term and the excellent awareness of the circular economy among European companies and consumers.”



Ecodesign rules in black and white

The World Economic Forum has actively promoted a circular economy and brought together businesses from different sectors. For example, suppliers and the brewery industry in the UK will start to use bottle caps with less colour pigments. This will reduce the costs of recycling caps.

Yeh says that cooperation influences the economy: it allows us to increase interaction between different parties involved in the delivery chain and reduce obstacles to the recycling chain. Furthermore, pioneering companies will benefit from their position because they will be able to plan their future business one step ahead of the competition.

The World Economic Forum and the Confederation of European Paper Industries (CEPI) are currently implementing a cooperation project to promote the recycling of paper. The paper industry suffers because of the decrease in recycling and the increased price of recycled fibre.

“If we are able to bring together the different parties involved in the delivery chain, such as paper manufacturers, chemical suppliers, printing ink manufacturers, printing houses and distributors, to discuss how the costs of recycled fibre could be lowered, we could save up to USD10 billion per year”, he estimates.

The goal is to draft eco-design rules that could improve the recyclability of fibres by reducing the use of chemicals, glues and other additives in end products.

“Once all the parties involved in the delivery chain are willing to fine-tune their business models, this cooperation will result in a global standard that national and local decision-makers will be able to use when adapting their policies. This will allow us to drive changes that will benefit everyone involved”, Yeh concludes.

The European International Association of the Deinking Industry (INGEDE) aims at reducing the environmental impact of the deinking process and improving the quality of recyclable fibre.

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UPM AND WWF FINLAND EXPAND CO-OPERATION INTO BIOFUELS

UPM and WWF Finland have long co-operated in several areas and engaged in constructive discussion on the sustainable forest management. Now the partnership has expanded into a new area, as the parties agree to concentrate on biofuels in more detail.

According to WWF, promoting sustainable forest management and ensuring the sustainability of biofuel production are both extremely important in terms of biodiversity and the climate.

“We are extremely pleased that UPM contributes in the transition from road transport fossil fuels to second generation biofuels, the production of which is not based on the food chain. Within this transition, sustainability needs to be carefully considered, which is one of the main principals of our co-operation,” says **Liisa Rohweder**, General Secretary of WWF Finland.

Bioenergy already plays an important role in the world's energy production, and in the future, this role will be further emphasised. WWF estimates that in order to ensure a sustainable future, transitioning to renewable energy sources is required by 2050.

Connecting with new stakeholders

Biofuels are the cornerstone of the development of bioeconomy. In addition to wood-based biofuels, UPM's biofuel strategy is based on reusing process waste and processing residue in the biorefining process.

The wood-based biofuels developed by the company will considerably decrease the dependence of transportation on fossil fuels.

“UPM's objective is to communicate the possibilities of wood-based biofuels and questions regarding sustainable development to new stakeholders, who can influence the road transport fuel industry sector”, says **Sari Mannonen**, Director, Sales and Marketing, UPM Biofuels.

Mannonen adds that responsibly produced wood-based biofuels are a worthwhile alternative, reducing traffic emissions and dependency on oil while also increasing the self-sufficiency of the economy.

Biofuel certification, sustainable forest management and forest certification are key in promoting responsible biofuel production and supply chain management. Among other things, the co-operation is intended to promote FSC certificate adoption in Finnish privately owned forests.



THE BILL STATES THAT 70% OF MUNICIPAL WASTE AND 80% OF PACKAGING WASTE MUST BE RECYCLED BY 2030.

EU PROMOTES RECYCLING OF WASTE

TEXT VESA PUOSKARI PHOTOGRAPHY UPM; COURTESY OF THE INTERVIEWEE



Jori Ringman-Beck

The European Union is reforming its circular economy legislation with the goal of improving the utilisation of waste as a resource. According to the bill, recyclable waste may no longer be placed in landfill as of 2025.

CEPI's Sustainability Director **Jori Ringman-Beck** says that the proposed EU legislation would force member states to improve their recyclable material collection processes. This applies particularly to member states whose processes are currently not so advanced.

“For example, if paper can no longer be taken to landfill, this will make it easier for the paper industry to get new raw material. Access to recovered paper has been a key issue in many member states and some mills have even had temporary closures due to the lack of raw material.”

The bill states that 70% of municipal waste and 80% of packaging waste must be recycled by 2030. The European Commission also proposes separate collection goals for plastics, wood, ferrous metals, aluminium, glass, as well as cardboard and paper.

“The primary goal is to increase awareness of the circular economy to assist the development of new business models and the management of materials. Companies could ponder, for example, whether they could rearrange their business or find new partners who would be able to utilise their by-products as raw materials,” he says.

Recycling of paper is a success story of the European circular economy – around 72% of paper was recycled in 2012. The recycling rate of paper has remained stable despite the fact that the consumption of paper has decreased. According to a report by the European Recovered Paper Council (ERCP), the quality of recycled materials has also improved.

BY-PRODUCTS ARE **VALUABLE RAW** MATERIALS

UPM is the world's third largest user of recovered paper in the production of graphic papers – around one third of UPM's raw material is recycled fibre. Some new fibre must also be used because wood fibres cannot be recycled indefinitely.

Recovered paper is only used if it is available close to the mill. Using mostly new fibres is the natural choice in countries with a small population or large forests. In 2013, UPM used around 3.5 million tonnes of recovered paper.

UPM's Biofore strategy, which aims at efficient utilisation of resources, has given rise to major innovations – non-renewable raw materials have been replaced with renewable and recyclable materials.

By-products that are valuable for the industry are generated when manufacturing self-adhesive label materials at the UPM Raflatac mills, in production for UPM's label-printing customers and among the end users who label their products.

The RafCycle concept ensures that these by-products are given a new life as raw material of UPM ProFi wood-plastic composite, an energy source at UPM paper mills or raw material in paper production. Previously, the by-products ended up in a combustion plant or landfill.

UPM BioVerno is an innovation developed by UPM. It involves refining tall oil, a by-product of the pulp manufacturing process, into a biofuel. By refining the crude tall oil, UPM is able to use the wood from pulp production more efficiently than before.

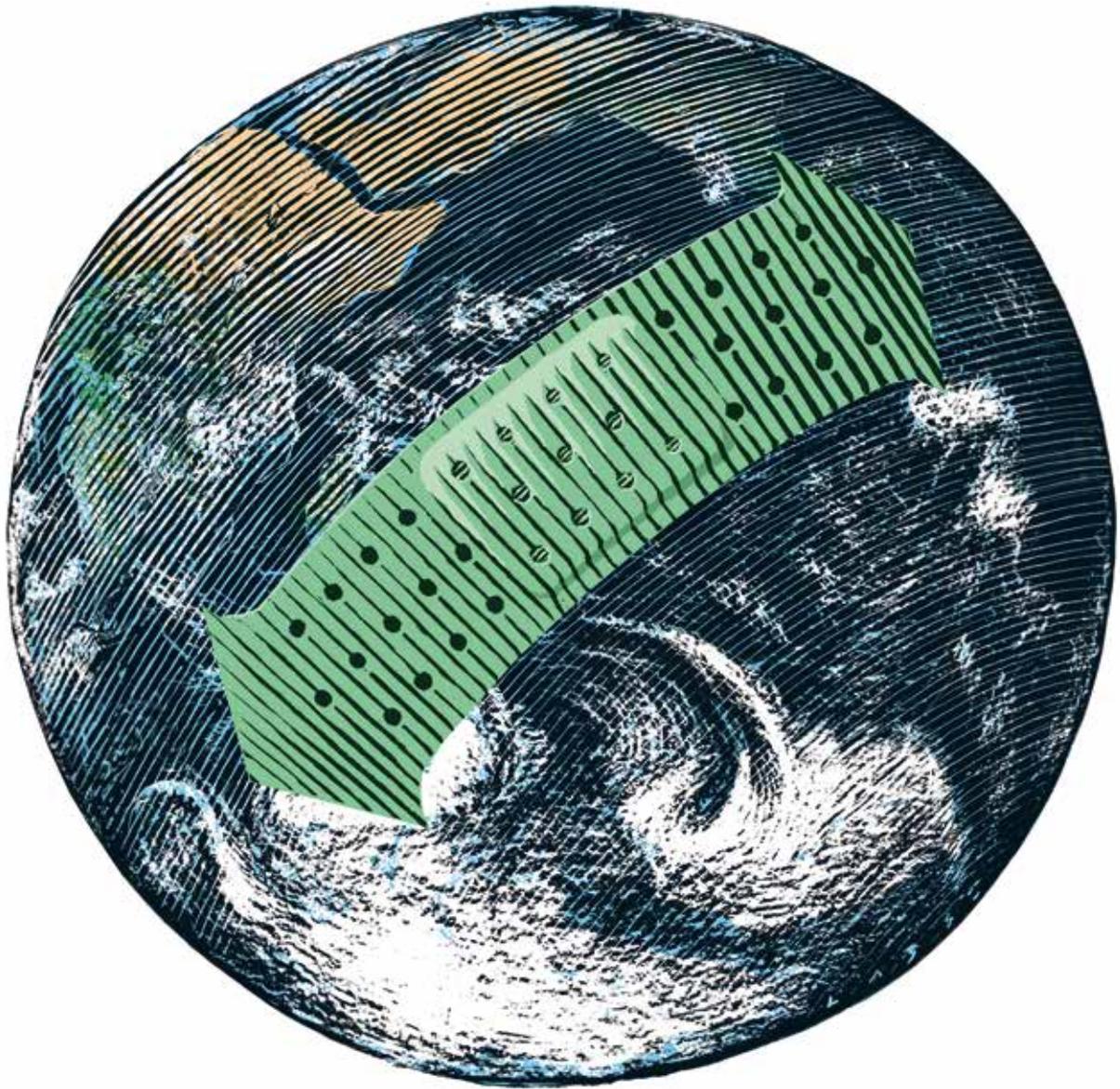
The UPM Shotton mill in the UK is a good example of material efficiency and the utilisation of raw materials throughout their lifecycle. The mill processes 640,000 tonnes of recovered paper annually, and it also processes household waste, plastics and cans. Around 120,000 tonnes of the total 270,000 tonnes of recycled materials sorted at the mill are publication papers that the mill uses as a raw material for paper.

A new pellet product, Fibrefuel, has been created as the result of cooperation between the Shotton mill and waste management experts. It is manufactured from paper fibres separated from wet waste. The pellets are turned into clean energy by burning them at the Shotton mill.

UPM's product development is based on ecodesign where the environmental impact and resource efficiency of new products are assessed right from the design stage. ○

A product's lifecycle extends from raw materials and energy sources via production and distribution all the way to recovery and disposal of products.





Financial giants, the United States, China and the EU, are currently preparing for international negotiations on cutting greenhouse gas emissions.

CREATING AN INTERNATIONAL CLIMATE AGREEMENT

The EU member states already made their decision when they agreed on the 2030 climate and energy package in October. Their goal is to reduce greenhouse gas emissions by 40% from the level in 1990 by 2030. This ambitious goal is domestic – international carbon credits can no longer be used.

Europe's share of global emissions is around 10%. China's share has increased to 26% while the share of the US is 14%.

The parties will not be able to resolve the emission problem on their own – they will need an international climate agreement where the largest countries show the way to the rest of the world. Negotiations for the United Nations Framework Convention on Climate Change will continue in Lima, Peru in December. The goal is to actually sign the Convention in Paris, France in December 2015.

Eija-Riitta Korhola, European legislator and researcher of international climate policy, says that the level of global emissions has continued its steady increase despite the Kyoto Protocol. If imported goods and consumption are taken into

account, emissions in the EU have actually increased.

“The best climate policy for Europe would be improving the business preconditions of European industry and adding incentives that would motivate businesses into investing in clean production technologies. The climate goals cannot be achieved if the competitive edge of European industries is driven down by adding to the financial burden of businesses,” she says.

Korhola points out that the EU originally thought that it would set an example to others so that they would start doing their share for the climate.

“That is not what happened; in fact, I believe that the EU is currently putting the international climate agreement at risk by trying to force its own binding emission restrictions on

the other parties. The EU should enter the negotiations with an open mind and pay close attention to the issues in which the others are willing to commit.”

Climate policy from a national viewpoint

The key parties of the agreement, China and the US, are implementing their climate policies based on their own starting points. For example, China's attitude towards climate change has changed over the past few years because of the country's major problems with air pollution.

Recently China and the US announced climate goals agreed in private bilateral talks that could also accelerate progress at the UN climate negotiations for transition to low-carbon economies and setting the global temperature goal of 2 °C.

China intends to achieve the peaking of CO₂ emissions and increase the share of non-fossil fuels in primary energy consumption to around 20% by 2030.

Analyst **Shin We Ng** of the international environmental



Eija-Riitta Korhola

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Marco Mensink

“We want to make the EU legislation more easily foreseeable, because if companies are unable to make new investments, they will not reach the emission reductions needed to meet the political goals. National economies will not grow either if they are not attractive enough to businesses.”

–Marco Mensink



“There are still several legislative barriers to ratification of the Climate Convention in the US. However, several countries have become more favourable towards the agreement since the Copenhagen meeting, which is why I believe that the Paris meeting will be a turning point for the international climate agreement,” says **Liz Gallagher**, EG3’s climate diplomacy expert.

Improved EU legislation

The key tools of the 2030 climate and energy package ratified by the EU are the emission trading system, the 27% renewable energy source objective and increased energy efficiency.

Marco Mensink, Director General of CEPI, the Confederation of European Paper Industries, says the new package better takes into account the concerns of European industries regarding the impact of climate policy on their competitive edge.

“The agreement includes a clause that continues free emission allowances to energy-intensive industries to prevent carbon leakage until the other leading economies start to apply similar systems to their own companies.”

Mensink says that this is a very important clause in terms of future investments. European politicians must make sure that industries will manage with the increased costs brought on by climate policy in the short term so that they will be able to reach goals in the long term.

“We want to make the EU legislation more easily foreseeable, because if companies are unable to make new investments, they will not reach the

organisation E3G says that China is investing in zero emission energy production, nuclear power, renewable energy sources and gas while also building new coal-fired power plants.



Shin We Ng

“I don’t believe that China is ready to formally commit to the international process; instead, it focuses on trying to stop the pollution of its own waterways, soil and air. China’s internal

status also plays a role in the process: China started a major financial reform last year. If the process goes as planned, China’s input in the international climate negotiations may be more significant.”

The status in the US has also experienced a major change. The utilisation of shale gas, in particular, will reduce the need to use coal, which will in turn reduce greenhouse gas emissions. The US announced in the agreement with China the intention to achieve an economy-wide target of reducing its emissions by 26%–28% below its 2005 level in 2025.



emission reductions needed to meet the political goals. National economies will not grow either if they are not attractive enough to businesses.

“Emissions trading will in addition to bringing carbon costs to industry also increase electricity prices. The European Commission has made a list of carbon and electricity-intensive sectors that are susceptible to carbon leakage so that they can be compensated at the national level. The list includes the manufacture of paper, paperboard, cardboard and mechanical wood pulp, for example.”

Innovations are necessary

Mensink points out that emissions cannot be reduced by using the currently available methods only. New kinds of solutions and technologies that are currently not in use are needed.

“CEPI has been promoting new innovation funds for a long time. The funds are to support breakthrough technologies that will be more effective in reducing emissions than current methods. This issue was recently added to the EU climate and energy package.”

When ratifying the 2030 package, the EU agreed on the NER400 fund to support innovations and investments which aim at reducing emissions. In order to create the fund, the European Investment Bank will sell 400 million emission allowances and allocate the funds to projects. The supported projects will be selected based on applications.

New to the agreement is that the fund will specifically aim to support the industries covered by the emission trading system. ○

A PIONEER IN CLIMATE ISSUES

Climate issues are a key part of UPM’s corporate responsibility, and the company has determinedly attempted to reduce its emissions in the long term.

“In addition to traditional methods, we have developed new innovations, such as wood-based renewable biofuels that will reduce greenhouse gas emissions from traffic,” says **Päivi Salpakivi-Salomaa**, Vice President, UPM Environment.

Some 67% of the fuels used by UPM are biomass-based and 78% of the electricity produced by UPM is CO₂-neutral. In the past decade, UPM has invested more than EUR 1 billion in the production of biomass-based energy and heat.

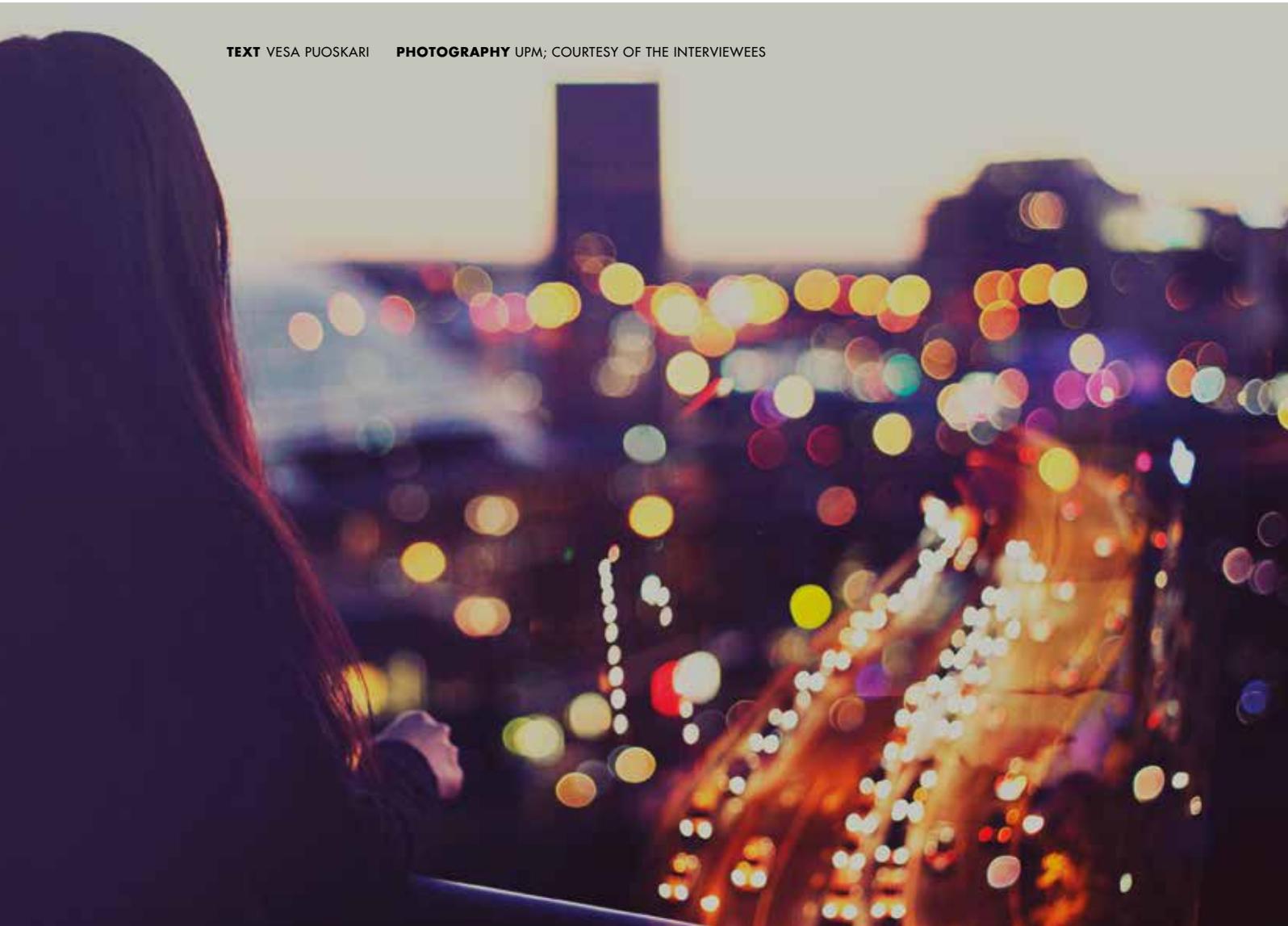
Furthermore, UPM has continued to improve the energy efficiency of its mills, which has decreased the consumption of electricity per tonne of paper produced by 20% in the past 10 years. UPM uses the best available technology at all of its production facilities.

This approach has been deemed successful in, for example, the Climate Performance Leadership index published by the international non-profit organisation CDP. UPM was the only paper and forest industry company to reach the full 100 points on the A list of the index in 2014.

CDP’s CEO **Paul Simpson** praises UPM for its exemplary work in fighting climate change. Companies that do well in the index have proven that they are capable of responding to the challenges that the ever-growing responsibility for the environment brings about.

“Pioneering companies are those that actively invest in reducing emissions and openly communicate information about their environmental issues. The investments are also profitable from a financial viewpoint,” he says.

The A list of the CDP index includes a total of 187 companies. Corporate data has been compiled based on a request by 767 investors. The funds managed by this group amount to more than one third of all the investment capital in the world.



The foundation stone for renewable energy

The Finnish forest industry is a trailblazer in the use of renewable energy sources, as well as the development and manufacture of products related to bioeconomy.

Finland's distinctive strengths in renewable energy production and bioeconomy in general stem from extensive natural resources, top-level expertise and a strong industrial basis, considers **Jan Vapaavuori**, Finnish Minister of Economic Affairs.

"Bioenergy and traffic biofuels form the basis for the use of renewable energy in Finland, and we have our rich forests to thank for that. Utilising forest industry by-products is at the very core of this development, but we can also achieve a significant increase in the use of other forms of energy. The share of wind and solar power production, for instance, is already growing."

From the government's point of view, wood should be used to create as much added value as possible. The government promotes the use of bioenergy by offering investment support for technology development facilities.

"The government also supports efforts related to biofuels, such as R&D projects and testing new technologies. Furthermore, we've striven to strengthen the market by means of tax solutions and an obligation to distribute biofuels," Vapaavuori adds.

Renewable energy sources account for over 25 per cent of the electricity produced in Finland.

A global trend

According to **Sixten Sunabacka**, Strategic Director for the forest sector at the Finnish Ministry of Employment and the Economy, bio-based raw materials will in future play an increasingly important role in facilitating welfare. Bioeconomy is growing into the next significant trend at the global level.

"While fossil-based products will continue to be used in future, demand for bioenergy and other bio-based products is bound to increase with the need to combat climate change."

Rapid development has blurred the distinctions between different industries in Finland. The forest and chemical industries have emerged as significant producers of bioenergy alongside the traditional energy industry.

"This integration has enabled us to produce energy in a cost-effective way and cleared new paths for cooperation between different industries. The chemical industry is interested in the



Jan Vapaavuori



Sixten Sunabacka



bioeconomy of the forest sector, and new wood-based traffic biofuels are closely related to the chemical industry," Sunabacka comments.

"Sometimes changes happen surprisingly fast. Who would have thought ten years ago that we would be producing this much bioenergy or fuel from wood today? This development is bound to gather momentum, so we have set very ambitious goals for the Finnish bioeconomy."

The Bioeconomy Strategy drafted by the Finnish government aims to increase the revenues of the bioeconomy to EUR 100 billion and generate 100,000 new jobs by 2025.

Bright outlook for biomass

Minister Vapaavuori considers biomass to have good prospects, despite the current economic situation hampering investment and government support for the renewable energy sector.

"Challenges may also be presented by the EU sustainability criteria for biomass, as well as the debate around its carbon neutrality. As for biofuels, EU policies and market development after 2020 remain unclear, and this has a negative effect on investment readiness."

Vapaavuori points out that the impact of the EU's 2030 Framework for Climate and Energy has so far only been assessed at a preliminary level.

"For instance, we still don't know what Finland's emission reduction commitment will be in sectors not covered by emissions trading, because the overall 40 percent target is yet to be translated into member state targets."

Preliminary assessments suggest that by 2030, emission reduction targets may decrease Finland's GDP by 0.2 to 0.7 percent and consumer demand by 0.3 to 1.0 percent compared to the baseline scenario.

"On the other hand, these calculations don't take into account the increasing business opportunities in clean technology and bioeconomy – two fields where Finland is already one of the top countries in the world by many standards."

Read about Finland's national biofuel target in the digital version of the Biofore Magazine at www.upmbiofore.com.



TEXT MARSHA MILLER PHOTOGRAPHY UPM AND JOHN CONNELLY

UPM set six global biodiversity targets in 2006 and reaffirmed those targets in 2011 to guide the development of individual country targets and local level forest tract actions plans.

Biodiversity Targets Take Root

1

Maintain and increase proportion of native tree species and their natural composition. Use harvest and regeneration techniques to ensure that tree species native to a particular site thrive.

2

Manage deadwood quality and quantity to enhance biodiversity. Deadwood provides an important habitat, shelter and food source for insects, especially beetles, fungi and lichens, but also birds, bats and mammals. Wood inhabiting species breakdown the wood structure releasing nutrients back into the soil where they can help living trees and other vegetation to grow.

3

Protect valuable habitats and manage them for their biodiversity value. Valuable habitats provide the richest and most varied components for biodiversity. They are often naturally small and the specialised conditions mean that many rare species can inhabit them.

Cheryl Adams, Forest Resources Manager at UPM Blandin: “These biodiversity targets identify key processes of the natural forest that we incorporate in our management plans. We are matching tree and plant species to the landscapes in which they naturally occur based on soil types, topography, moisture availability, and other environmental factors. Plus, we are aggressively tracking the results of our management practices.”

“These targets are really forest management techniques to promote biodiversity and measure and track our progress in restoring or ensuring a healthy forest,” says Adams.

Adams explains how logger certification is essential to achieving healthy productive forests in Minnesota in the US: “Once the environmental data is analysed and the planning and timber sale design is completed, the success of the harvest and subsequent regeneration depends on our loggers. We work closely with independent professional loggers who are designated Master Loggers along with obtaining continuing education through the Minnesota Logger Education Program (MLEP). Our loggers are trained to

maintain soil productivity, preserve water resources, protect critical habitat areas and prepare for regeneration of the harvested forest units through a series of Best Management Practices (BMPs) established by the Minnesota Forest Resources Council.”

BMPs are imbedded in Blandin ISO procedures and accreditation, so there is no room for noncompliance. All forest product suppliers are certified Master Loggers who are required to participate in annual training to ISO standards. Master loggers are third party audited to ensure that they maintain their training and demonstrate the skills necessary to achieve healthy forest practices and targets on harvest sites.

“I enjoy taking our customers into our forest lands. After seeing the vast and diverse landscape of Minnesota’s healthy forests and touring our harvest sites they are assured that UPM’s global targets and sustainable forest management are integral to the management of UPM Blandin lands,” concludes Adams.

Read more about Biodiversity targets in the digital version of the Biofore Magazine at www.upmbiofore.com.

LIVING AND WORKING IN A HEALTHY FOREST



Jim Scheff, 2014 Logger of Year and UPM Master Logger lives and works in the forests of northern Minnesota.

“It’s simple really... it’s a healthy forest when wildlife thrives and families can earn a living from the land. But achieving that goal takes a lot of planning and hard work.

As a Master Logger and a UPM Blandin supplier, I attend annual training focused on sustainable forest management and biodiversity, and participate in third party audits of my worksites. In addition, my brother and I audit our jobs and have specific checklists for our harvest sites to ensure we comply with company and landowner objectives.

When I walk through the forest I appreciate having a ‘light foot’ on the land to prevent soil compaction and erosion. I see the diversity of plant life as essential to wildlife. And I know that the more forest diversity we have, the healthier and more productive the forest will be – that is crucial to a logger.

Read more about Jim Scheff in the digital version of the Biofore Magazine at www.upmbiofore.com.

4

Manage variation in forest structure at area and stand level. Different species require variety in the distribution of trees either vertically in a stand or across the forest.

5

Maintain open water bodies and wetland. Rivers and lakes provide a wide range of habitats for fish, many different mammal, plant, bird and insect species.

6

Implement plans for remnants of natural forests. In addition to promoting biodiversity, strictly protected remnants of untouched natural forests are needed for research and education.

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TRACING THE SOURCE OF WOOD

Forest certifications define exactly how forest owners have to look after their land property and how to harvest forests in a sustainable manner.

“At the same time, forest certifications together with Chain of Custody model guarantee UPM’s customers and consumers that the whole value chain is operating according to the same principles,” explains **Sami Oksa**, Environmental Manager, Wood Sourcing and Forestry, from UPM.

UPM promotes all credible forest certification schemes, including the two major international schemes PEFC and FSC. The SFI (Sustainable Forestry Initiative), which is the most common system in the US, is endorsed by PEFC.

“Overall, the objective of all schemes is to ensure that forests are managed in an economically, environmentally and socially sustainable way”.

UPM owns a total 1.1 million hectares of forestry land in Finland, the UK, Uruguay, and Minnesota, USA. All UPM-owned forests and the majority of private forests under UPM management are certified.

Approximately 80% of wood fibres used by UPM originates from certified forests.

Communicating sustainability

UPM utilises Chain of Custody (CoC) certification – a wood fibre tracking system providing a traceable link between forests and end products. UPM has created its own UPM Generic Chain of Custody model which fulfils both PEFC and FSC certification requirements.

According to Oksa, the system is used to verify that procured wood is legal and doesn’t come from controversial sources like nature protection areas or violate the rights of indigenous people, for example.

UPM utilises forest certification logos for communicating the sustainability and certification status of timber, paper and other wood-based products to customers.

“PEFC and FSC logos can be used in various products on condition that the whole supply chain has a certification. Thanks to the system the origin of wood used for products can be verified all way down to customers who buy the end products”, Oksa concludes. ○

Every year, hundreds of contractors work at UPM mills. The same safety guidelines and requirements apply to them as for in-house personnel. They also benefit from UPM's strong focus on improving workplace safety.

For example, at the UPM Kymi mill in Finland, contractor accidents decreased by a magnificent 87% during the first two years of the Step Change in Safety initiative.

SAFE WORKING ENVIRONMENT

"Now we are more cautious"

One of the contractors is Garanti Mekan, a company specialising in the assembly and maintenance of paper mill machinery. They do maintenance work at the Kymi and Kaukas mills in Finland and were one of 11 companies globally to receive an award for their workplace safety results in 2013 and strong commitment to the UPM safety requirements.

Occupational safety manager **Jari Korja** from Garanti Mekan notes that workplace safety has improved tremendously in the past few years. The safety equipment has certainly developed and is more carefully maintained than before. However, the greatest change has clearly taken place in people's attitudes.

"We all now have more caution. UPM and Garanti Mekan never take risks in order to save time. We always ensure safety before we take up our tasks and no-one goes to dangerous places," he describes. "Investing in safety really is the only way. There is no option."

Safety leads to efficiency

Taking greater care of workplace safety has not caused any delays. In fact, the new safer ways of working often save time as maintenance work is now given more thorough preparation.

"Thanks to this, we can start maintenance work on the first day of the stoppage and get on with it really efficiently. This saves time compared to the less organised ways of the past," Korja explains.

All Garanti Mekan personnel servicing UPM machines have taken the generic safety training provided by UPM as well as relevant mill-specific training.

Another safety related activity that is of paramount importance is the safety briefing about the specific area where the team will be working.

"Before we get permission to start, the respective UPM foreman gives us the briefing. It is then our foremen's responsibility to ensure that everyone in our team operates according to the safety requirements," Jari Korja concludes.

The change in attitudes has been profound. Even the older generation has adapted to the new way of meticulously going through the safety issues before starting to work. "This is essential. Safety equipment only has value if employees are motivated to use it."



Everyone wins with RafCycle® – **Biofore in action**

There's something very rewarding about 'closed-loop recycling' that transforms what was once waste into new products, energy and paper.

RafCycle does just that with the waste from self adhesive labels that are used in major industries such as food, wine, personal and home care products.

Launched in 2007 by UPM Raflatac – one of the world's leading producers of pressure sensitive label materials – RafCycle has won delighted customers and awards, reduced carbon dioxide emissions and become a benchmark for sustainability.

Now waste has become a money-saving resource and RafCycle a feather in the cap of those who use it. Instead of being incinerated or going to landfill, the label waste generated in the lifecycle of pressure sensitive label stock is collected by UPM and recycled locally into paper or energy in one of the company's power plants, or into UPM ProFi® – 100% recyclable wood and plastic composite boards used for outdoor decking and patios.

Reklam Speciaaldruk

High end label specialists Reklam Speciaaldruk are a third generation family business with a sharp eye on the future and sustainability.

When the firm adopted the RafCycle system to recycle label liners into paper, energy and UPM ProFi products, it was a major boost for their sustainability efforts. But there was an additional, unexpected, benefit – the move also attracted attention from new customers.

Yves Smit, owner of the Netherlands-based label printer serving the retail, luxury, wines and spirits sectors, says the rewards are swift and excellent.

"We first saw RafCycle really make a difference when some of our potential customers immediately wanted to be involved," he said.

"As a company we were thinking about how we could become more sustainable for a long time, but UPM Raflatac really helped make sustainability part of our DNA. With them, we gained a partner that understands sustainability not as a marketing tool, but as a helpful way of reorganising your business.

"The support we received in logistics was great and the collection of the materials has been on a level never before seen in this industry. Implementing small changes not only make big steps for sustainability, but also save costs in the long run."



Smit says it will be worth the wait for the full economic benefits of RafCycle to come through.

“The return on investment for the initial set up costs was about eight months, but after two years we aim for a huge rise in EBIT on this market.”

Reklam Speciaaldruck believe that sustainability is no longer a trend, more a necessity, though very few industry leaders are taking steps to make it a reality.

“Now is the time for the label industry to develop their sustainable performance,” he says. “We must set a benchmark for the next generation and the many that will follow.”

For UPM Raflatac, **Wouter Hartog**, Sales Manager for the Netherlands, agreed the project had become a ‘win-win-win’ for all concerned: “This partnership is a real success story. Since the start of RafCycle we have not only strengthened our relationship with Reklam, but they have gained new customers who are also committed to corporate responsibility. Their success with RafCycle lies in how professionally the programme has been employed and utilised to its full advantage. Reklam’s commitment to RafCycle has really paid off.”

Coveris

As one of Europe’s largest manufacturers producing over 1.5 billion labels every month, Coveris already has great credentials in environmental efficiency and sustainable process

Now Rafcycle has helped the company advance its 360-degree model of responsibility so the 3R principles – reduction, recycling and reuse – are complemented by a fourth R -recovery.

As **Sian Bates**, Marketing Manager with Coveris in the UK, explains:

“As one of the world’s leading manufacturers of plastic, paper and cardboard packaging solutions, we recognise our responsibility to minimise, and where possible, offset, the environmental impact of our packaging products, to ensure a more sustainable future for our environment, customers, staff and our local communities.

“Our passion and aim therefore is to be the best supplier in our field with the least effect on our environment, which we facilitate through the universal application of the 4R principles of reduction, recycling, reuse and recovery. These are embedded across our entire value chain to deliver a 360-degree model of responsibility.”

Coveris is a global player, with more than 70 operations in 20 coun-

tries, 9,000 employees and more than 60% of group-wide operations in food.

Such massive production results in a significant amount of by-product and production waste, and Coveris has made major financial and technological investments in creating a sustainable infrastructure and an environmental services model for managing the complete label lifecycle.

“We segregate, sort and redistribute our waste, along with the backing paper collections from our customers in order to redirect, and in a lot of cases recycle, over 2,500 tonnes of process waste from landfill every year.”

Now their UK division has an environmentally leading cradle to grave model for Coveris label products which they want to take further, recognising Rafcycle as a major benefit to the business.

“We are very much within the early stages of supporting the ProFi process but by working in partnership with UPM Raflatac, we are looking to expand this supply significantly using their environmental transport structure to put even more of our waste and by-products to regenerative use. This process effectively enables us to turn our chain of custody into a cycle of custody through a closed-loop system of sustainability.”



Office paper

in high demand in Asia

Xi'an Wenbo Science and Technology has been UPM's office paper distributor in Xi'an, Central China, for the past 11 years. General Manager **Liu Haibin** values UPM products for their high quality and extensive range.



Liu Haibin

According to Liu, customers see UPM as a trustworthy supplier whose delivery reliability and quality are well established. Customers are increasingly requiring paper manufacturers to be environmentally ethical and responsible in their operations.

"UPM is increasingly flexible and active in responding to market changes and providing new solutions and means for problem solving," Liu says.

Cooperation keeps business running smoothly

According to **Zheng Rong**, the General Manager of Zhenxingheng distribution company, long-term cooperation with UPM has helped develop the company operations and management system. The company has sold UPM's office papers for the past 16 plus years in Chengdu, Western China.



Zheng Rong

"Thanks to this cooperation, our knowledge of copy paper has significantly increased," Zheng says.

He also values the high level of quality control at UPM.

"One of the most important aspects about the products is reliable quality in each delivery."



Paper product distribution company Wuxi Baiwen Paper has sold UPM's office papers for 12 years in Wuxi, Eastern China. General Manager **Hu Xinyuan** says UPM's operations have constantly improved over the years.

"UPM's exhaustive market surveys and their understanding of the market situation are their definite strong points. UPM's products and services are well suited to answering market demand," Hu says.



Hu Xinyuan

Competitive edge excelling in day-to-day service

According to UPM Sales Vice President **Jaakko Nikkilä**, office paper is a growing industry for UPM in the Asia-Pacific region. The company started manufacturing these grades in the Changshu paper mill in China as early as 1999.

"We have had a long-term focus on cut-size growth. Our capacity has been gradually increased with a very determined approach while developing our products and services. Our customers are very familiar with UPM's products, services and the way we operate," Nikkilä says.

Competition is tough, as the production of office paper in Asia exceeds demand. The quality of local products has also improved.

"UPM's reliable management of daily business operations gives us a competitive advantage. We provide a consistent day-to-day service entity that best benefits our customers."

MARKET GROWTH IN CHINA OVER 5%

The demand for office paper in the Asia Pacific region has increased to approximately 4 to 5 million tonnes a year. This is roughly equivalent to the size of the market in Europe or the United States.

However, compared to Europe or North America, the market for office paper in the East keeps growing fast. In China demand is expected to grow over 5% a year. Elsewhere in the Asia-Pacific region, the growth rate is approximately half of that.

Key factors behind this growth are general economic growth, urbanisation and the increasing number of offices.

All these factors contribute to the increase in office paper consumption. As the market develops, the quality demands for paper also increase.

UPM has dedicated office paper brands for the Asia Pacific region. The company also acts as a contract manufacturer for other brands.

China is the fastest growing market in the region. UPM supplies significant amounts of copy paper to other key markets in the region as well.



Paper
loved
by human
senses



YOU CAN FEEL AND SMELL PAPER. YOU CAN HEAR IT WHEN THE PAGES OF A NEWSPAPER ARE TURNED. THESE SENSATIONS AID YOUR MEMORY. IN THE CURRENT WORLD OF STATE-OF-THE-ART TECHNOLOGY, WE INCREASINGLY NEED SOMETHING TO TOUCH: PAPER.



Can you still remember the days when the postman brought you heavy envelopes made from coarse paper, complete with a handwritten address? You opened the envelope to see an announcement of the birth of your best friend's first child on a deckle-edged sheet of paper. You mused on the child's name, stroked the paper and admired its understated colour and stylish font. You thought that you could even smell the printing ink. You could hardly wait to show the card to your family, and afterwards might place it on the mantelpiece to be admired. You knew that you'd never forget that card.

Now consider how well you remember the breaking news in today's newspaper. Was it about the war in the Middle East or perhaps the European Central Bank's interest rate policy? Or had there been an accident in a mine somewhere in the world?

Where did you get the news: did you read it on the pages of a newspaper or was it accessed online with your tablet?

Believe it or not, the type of media and the reading method matter. Different media invoke different kinds of sensations, and the more senses triggered, the better the human memory works. You can remember a card you got from a friend – or any similar item – so well because when you read it, you used not only your sight but also your sense of touch and perhaps even your sense of smell. When you handled the card, the movements of your hands activated your brain and your memory.

You are less likely to remember the news you read this morning, particularly if you read it on a screen. This is because you only used one of your senses – sight. What’s more, you didn’t read the news in the same way that you read the card: you quickly skimmed through the headlines and maybe even only read the first paragraph of each article while replying to your most urgent e-mails, logging into your intranet and posting the results of last night’s game on Facebook. Instead of focusing your attention on one thing, reading and working become combined.

Touch is the elixir of life

The world has undergone a digital revolution but people have not. People are still what we call “multi-sensory beings.”

“The more digitalised our world becomes, the more we long to be touched,” says **Sebastian Haupt**, a consumer psychologist, who works as a consultant for Touchmore, a German agency specialising in haptic sales promotion.

Haupt has studied haptics – the sensitivity and functionality of touch – focusing on how it could be used to pique consumer interest.

“More than 80,000 products are actively being advertised in Germany, and most of the advertisements go unnoticed,” Haupt says.

The media reach immediately increases when a person can actually pick up the product being sold. In their recently published book, *Touch! Der Haptik-Effekt im multisensorischen Marketing*, Sebastian Haupt and **Olaf Hartmann** give several examples of successful marketing campaigns that use haptics.

Biscuit manufacturer DeBeukelaer used packaging that resembled newsprint, telling consumers that the biscuits are authentic and local. The car manufacturer, Smart, delivered a 3D cardboard model of their Smart Fortwo city car



Vorwerk,
get your sofa back
Advertising Agency:
Kolle Rebbe,
Hamburg, Germany

to residents in Madrid, Spain. People were amazed, and a large number of them were inspired to find more information about the Smart Fortwo online. The implicit message of the ad was instantly clear: this is a car that will only need a small parking space on the narrow streets of Madrid.

“Messages backed up by haptics will be noticed,”

Haupt points out. “They appeal to people’s curiosity and playfulness.”

Most successful advertisers use a variety of media. Studies show that the most efficient advertising campaigns reach out to customers by phone, e-mail and letter.

“One of the benefits of printed products is that they do not evoke subconscious resistance. People can choose when they open and read them, leading them to focus on what they are reading. At the same time, the act of touching the paper sends signals to the brain that support the contents of the letter.

People read both consciously and unconsciously.”

Haupt says that a more technological world only serves to make our sensory experiences poorer. The less opportunities we have to use our senses, the more we want to use them. First, the typewriter was replaced with





a mouse and then the mouse was replaced with a touch screen. The next step will be haptic screens, where instead of being completely flat, the surface of the screen can be felt using the fingertips.

Haptics can be seen in many German speciality magazines that reach a wide readership and are published frequently because of their popularity.

“Flow, a zeitgeist magazine for women, is a good example,” Haupt says. “The readers can see that the magazine has been lovingly prepared: you can see that the articles have been carefully researched and the paper is of a high quality, and you will sometimes find postcards etc. between the pages.”

The magazine appeals to all of your senses, and your senses tell you that this is a reliable product.

“The mind can consciously process 40 bytes per second, but in the same period of time, the subconscious can process around 11 million bytes. Your subconscious needs to be convinced of the magazine’s high quality,” Haupt explains.

In addition to many other factors, the quality, weight and texture of the paper create an overall impression of reliability. Indeed, a test revealed that a person seemed more trustworthy when his CV had been presented on heavier paper rather than on lighter weight paper.

In another example, two German banks launched an

advertising campaign to their customers. The campaign that sent letters in addition to digital communication was far more successful than the other bank’s campaign. “Paper has a major impact,” Haupt summarises.

After optics, haptics is the second most important sense in influencing consumers’ purchasing decisions as the sense of touch is our reality sense. We believe what we feel.

Otto catalogues are part of the national culture

The same observation has been made by major German fashion and lifestyle conglomerate, the Otto Group. It’s almost impossible to imagine a German sitting room without picturing a mother browsing a 1000-page Otto catalogue.

Jackets, shoes, blouses. Mobile phones, headsets, CDs. Travel. Interior decoration. Anything you could possibly want presented in tempting images you can almost touch.

The Otto catalogue has a long tradition in Germany. The successful catalogue began life as a modest, handmade mail order publication, and 300 copies of the catalogue were distributed to Germans trying to recover from the war in 1949. The current print run of the brick-like catalogue is 4 million. Otto prints 35 billion circulated pages per year and publishes around 250 different catalogues. Its parent company, the Otto Group, publishes up to 1,800 different catalogues.

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“Each
new sense
will increase
the function
of your brain
by 1000%.”

– Sebastian Haupt

The company believes in its catalogues and actively updates them.

“The catalogues are no longer a mere sales channel. Instead, they are a marketing tool,” says **Alexander Voges**, Division Manager, Format Management, Otto Group. The main purpose of the catalogues is to lead the customer to the online store.

There are on average 25,000 clicks on the Otto website per minute and more than 80% of the company’s total sales come from the online store. The product selection is staggering: over 2 million products spanning 5,000 brands are stocked. However, it’s clear to the company that customers should not be left to rely on a website or mobile app alone. In digital format, it’s impossible for the customer to acquire a comprehensive overview of the product range.

The best solution is to combine familiar printed directories with modern media.

“The catalogues are first and foremost a source of inspiration and an instigator of needs,” Voges explains.

They form a crucial part of a consumer’s purchasing journey, a journey which is very different for people of different ages. While people aged around 25 prefer to shop on their mobile devices, 39-year-olds like to browse the website, and 44-year-olds prefer to browse catalogues.

Consumers will

remember a beer ad
they saw in a magazine
because they were able
to pop the bubble wrap
that reminded them
of the foam on
a glass of beer.

“The best thing about catalogues is that you can study them along with someone else and you can compare products in a way that differs from comparisons online,” Voges says. “If you don’t know exactly what you’re looking for yet, you are more likely to discover the unknown product offline rather than online.”

Since catalogues are primarily a source of inspiration and consumers then go to the online store to order the products, it is essential that the catalogues are renewed. In addition to the main catalogue that comes out twice a year, Otto publishes several catalogues with clearly defined target groups. Some of them are intended to attract new customers. The lifecycles of these catalogues vary from a couple of weeks to a couple of months, and their themes range from seasonal to impulse purchases.

Modern catalogues are, in many ways, different from the mail order catalogues of the past. Instead of providing detailed product data, the catalogues present combinations of products, effectively linking products as ensembles. The reader finds hints about interior decoration, travel or perhaps lipstick colours that go with the dress on page 32.

Even though most consumers make their final purchase decision online, the printed products have a clear role.

“Many large online stores are planning to publish printed magazines or catalogues to support their online sales,” Voges reveals.

Navigating a huge online store is easier when you can also flick through the pages of a physical catalogue.

Printed media enables better understanding

Another person who is familiar with the ease of navigation is **Anne Mangen** of the Reading Centre of the University of Stavanger. Mangen and her colleagues have studied reading on both paper and screen, and the results of their studies have been discussed globally.

Together with French researcher **Jean-Luc Velay**, Mangen studied the differences between students reading a traditional book and students reading an eBook on a Kindle. The results were similar, but there were differences in how the students perceived time and events. Mangen is of the opinion that more detailed study is required regarding whether more is lost when people read novels on a screen.

Studies show that digital information will disappear from people’s memory faster than information they read on paper. Furthermore, people understand text better when they read it on paper. Why is this?

“One obvious difference between the screen of a computer and the paper of a book is that paper is a concrete material. You can feel the weight, structure and thickness of the book or magazine in your hands. You can see where the book starts and where it ends. You can quickly flick the pages,” Mangen explains.

Such an immediate experience offers the reader a “mental map” of the whole.

“It may be less challenging for the human brain when the text is fixed on paper and the sense of vision is aided by the tactile feedback provided by the substance of the paper,” Mangen says.

A screen seems to be well-suited to fast, cursory reading, while paper is a better alternative if you are reading longer texts or documents. Anne Mangen says that teachers should not try to eradicate paper as a result of a blind faith in digital technology.

High tech – high touch

Haptics specialist Sebastian Haupt is aware of the results of this Norwegian-French study. The more senses activated when reading, the better you will remember what you have read.

“Each new sense will increase the function of your brain by 1,000%,” Haupt summarises.

Consumers will remember a beer ad they saw in a magazine because they were able to pop the bubble wrap that reminded them of the foam on a glass of beer. They will also remember the car ad that showed how little parking space they would need because it was unlike any other ad they had seen before.

What do you, dear reader, remember about what you have read? How are you reading this article – in a magazine or on the screen of a computer? Are you leaning rigidly forwards while staring at your screen or are you leaning backwards, relaxed while thumbing through the pages of the magazine? Are you taking breaks from reading to reply to your e-mails or are you consciously focusing on what you are reading in the magazine?

Does the platform that you read from really matter so much? Nobody knows for sure. What matters, however, is retaining a sense of balance in human life. The more technical our world becomes, the more we long to be touched. This was already established by trend researcher John Naisbitt in 1982. Paper speaks directly to your senses. ◉

Everything From Spruce Plywood

Versatile material

WISA-Spruce plywood is manufactured in the UPM Pellos plywood mill near Mikkeli, Finland and is made from environmentally certified Nordic Spruce.

Spruce plywood is created by gluing together multiple wood veneers, and each layer is attached in an adjacent direction to the previous one. It is a strong and durable material that is easy to work with and surprisingly light.

For example, plywood is often used for the load bearing parts of sofas and other furniture, as well as for structural and interior applications in busses and other vehicles.

The versatility of WISA-Spruce also offers benefits to distributors. Since it can be used for many different applications, distributors don't have to carry a wide selection of different products, ensuring that stock turnover remains high.

WISA-Spruce is shipped directly from the mill or via storage sites in the UK, Belgium, the Netherlands and Germany.

"That way customers don't have to order the product from the other side of the world and buy several months' worth of stock at once, which would tie up capital needlessly," says **Riku Härkönen**, Product Manager of WISA-Spruce

Light but strong

Spruce plywood weighs on average 450 kilogrammes per cubic metre, whereas a similar competing product such as South American pine plywood weighs over 100 kilogrammes more per cubic metre.

In addition to being light, spruce plywood panels are extremely straight, meaning that they are easy to use: on a construction site the panels can be moved by one worker alone. This offers clear cost savings for the constructor.

Developers and builders appreciate solutions that minimise the weight of structures. For example, the 22 millimetre thick OSB panels in roof structures can be replaced with 15 millimetre spruce plywood panels, which both reduces the amount of material needed and lowers the structural weight by almost 50%. This represents a significant difference to the supporting structure load. Furthermore, builders really appreciate the durability and reliability of WISA-Spruce. In the right conditions, it will remain unchanged for over 100 years.

Quality mark guarantees top quality

When a building contract is commissioned, it's important that all construction materials fulfil the official criteria and standards. UPM was one of the first plywood manufacturers in Europe to use the CE mark on its structural plywood. The marking guarantees that the plywood is tested and reported in accordance with European product standards. As a European manufacturer, we know exactly what will be required of the product, so plywood distributors don't have to worry about meeting the quality requirements. We take full responsibility for the quality and take care of product approvals along with the other necessary requirements.

Origin always known

The traceability of forest-related products is becoming more and more important for consumers and corporations. WISA-Spruce is manufactured from spruce that has been harvested from natural forests.

At UPM, we source our own wood, which is a huge advantage for us. We know the origins of the wood and where it has been sourced.

Finnish legislation dictates that all forests should be managed and used responsibly, which guarantees the availability of raw material that has been grown sustainably. Responsibility is also demonstrated by the PEFC and FSC certificates.

Retaining carbon for hundreds of years

According to studies comparing the lifespan of different construction materials, a building made of wood impacts the environment less than similar buildings made from other materials. Most of the carbon contained in harvested trees remains in the wood products and is not released into the atmosphere. The plywood used in buildings and furniture will retain carbon for decades and even centuries.

Timely deliveries

It would be disastrous for a construction site if they had to wait months for important materials, and equally a production plant would be in serious trouble if they needed to constantly change suppliers due to delivery problems.

Customers in the wood products industry want to avoid risks and secure constant material deliveries. Reliable deliveries are extremely important. If we promise to send a plywood shipment to a client on Friday, then we ship it on Friday, no matter what. We constantly measure our performance and strive to offer better services.



UPM's spruce plywood is a versatile material that is used in various applications from building and construction to vehicle and furniture manufacturing.



PHOTOGRAPHY SAMI KULJU



Royal Technology Mission and His Majesty King Carl XVI Gustaf of Sweden, visit Biofore House

In November, UPM was honoured to host The Royal Swedish Academy of Engineering Sciences (IVA). As patron of IVA, **His Majesty King Carl XVI Gustaf of Sweden** participated in the event.

The Royal Swedish Academy of Engineering Sciences was founded in 1919 and was the first engineering science academy in the world. Since 1984, IVA has organised visits outside Sweden on a regular basis, under the heading “Royal Technology Mission” (RTM) in which His Majesty the King participates in a delegation of distinguished business and

research leaders visiting a country of interest. The purpose is to study the science and business climate as well as to foster new relations and collaborations between Sweden and the host country. This year RTM 2014 focused on Finnish achievements and initiatives that can inspire Sweden, since Finland has made great efforts to establish an innovative knowledge economy.

In addition to the visit to UPM the RTM also visited Supercell, Kone, Outotec and Vaisala.

In CEO **Jussi Pesonen**'s presentation, the delegation was informed about UPM's traditional and new products and the transformation of the company.

After the presentation, Chairman of the Royal Technology Mission **Leif Johansson** (chairman of Ericsson and Astra Zeneca)

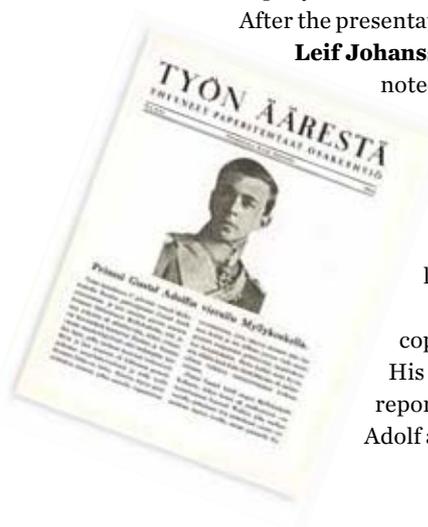
noted that it has been wisely said that actually there is no “mature business”, there is only “tired management”.

He concluded that, based on what the delegation saw today, he was certain that UPM is not a tired but an energetic and forward looking company.

As a memento of the day UPM presented a copy of UPM's employee magazine from 1934 to His Majesty the King. This issue of the magazine reported on the visit of his late father Prince Gustaf Adolf and Earl Folke Bernadotte's visit to Myllykoski.



KUNGL. HOVSTATERNA.
THE ROYAL COURT, SWEDEN.
PHOTOGRAPHY ALEXIS DAFLOS



POWER FROM THE WOODS

WOOD-BASED RAW MATERIAL

100%

UPM has built the world's first commercial scale biorefinery producing renewable diesel in Lappeenranta, Finland, where preparations for full start-up have begun.

The fuel is called UPM BioVerno, and unlike traditional biofuels, it is made entirely of non-edible raw materials, namely residues from pulp production.

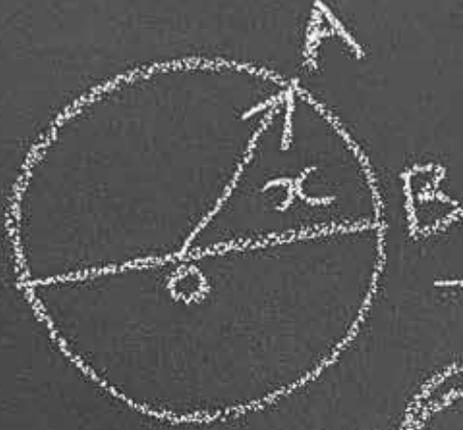
UPM BioVerno is a low-emission renewable diesel that is well suited for all diesel engines. A responsible and innovative alternative.

MORE WITH BIOFORE

Want to know more?
www.upmbiofuels.com



$$f = 0 + 15$$



79
A

$$\lambda = 2.79$$