Fiber industry is in motion

#sipaper

In focus
Challenges for the fiber industry in the digital transformation

International projects
Solutions for flexible and efficient production worldwide
»It’s about more than the production of cellulose and paper, it’s about sustainable mass production of a wide range of products made from wood as a natural material in the age of digitalization, while challenges and opportunities transform our industry.«
There is another way

Each year, vast quantities of plastic waste – up to 13 million tons – end up in the world’s oceans, are broken down much too slowly there, and thus enter the food chain. Each year, mankind also releases about 35 billion tons of carbon dioxide – a greenhouse gas resulting largely from burning fossil fuels. The fiber industry is contributing to ecological improvement by gradually converting to sustainable packaging, using renewable sources of energy and biomass materials for chemicals, as well achieving higher recycling rates.

The age of digitalization not only enables new and significantly more variable production processes, some of which are autonomous, it also makes complex simulations and remote maintenance services possible. However, the need for certain products is also changing, and doing so at a rapid pace. In many places this is causing a shift away from graphic paper production to meeting rising demand for packaging and hygiene papers, as most recently happened at Metsä Husum in Sweden, ProGest Mantova in Italy, or Leipa Schwedt in Germany, often under new ownership.

Once again, we are seeing significant investments in new systems for viscose, market pulp, and packaging paper production, especially in Asia. More and more companies are pursuing innovative approaches which use wood as a raw material for creating more than just pulp, paper, or electrical power, but also supply these products to other industries, such as the food and textile sectors.

It is clear that the 10,000 paper and pulp mills in existence throughout the world today will undergo continuous change under these conditions. With many years of industry expertise combined with our products, solutions, and services, we help our customers make their production more environmentally friendly, resource-efficient, and profitable – with integrated engineering solutions, energy generation and distribution, efficient drives, factory-wide process automation, data analysis, and initial cloud services.

In this issue of “The Magazine for the fiber industry,” we will provide you with insights into international developments in our industry: How are new market requirements successfully dealt with? How are large projects managed so that they are sustainable? And how do researchers open up new fields of application for a wide variety of products made from the natural material wood?

Join us on a brief journey through a fiber industry in the midst of transformation. I hope you enjoy reading this issue.

Jan Kabus
Vice President Fiber Industry
Siemens AG
Mikael Leksell, CEO of Process Solutions, Siemens AG, talks about the innovative Swedish fiber industry.

In China, Stora Enso implements the entire value chain at a single site: from a eucalyptus plantation to production.

Making of: Bettina Raunecker and André Vieira Auer build a model to illustrate fiber industry processes.

Greenpac Mill in North America is a paper mill with the highest degree of automation.
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Cover photo:
The digital transformation continues to advance:
the fiber industry is embracing change and trends in
order to remain competitive in international markets.

(iStockphoto/RonTech2000)
From stalk to smart packaging

Paper from tomato plants, cosmetics made of eucalyptus or fiber-based insulating materials – the fiber industry is changing. With Industrie 4.0, the next (r)evolution is in full swing. Whether production processes, business segments, or entire markets, digitalization calls everything into question – and offers many opportunities.

New technologies, new product ideas, more demanding customers – to remain viable, companies need a shift in mindset. In the Industrie 4.0 and digitalization era, the formula for success is to have customized products of the highest quality which are immediately available at good prices. Consumers have also long since come to appreciate these advantages. But while other industry sectors such as IT or automotive have long become involved in digitalization, the digital transformation of the fiber industry is only just beginning.

An industry undergoing change
And this change is unfolding although the industry is booming. According to CEPI, last year some 410 million tons of paper were produced worldwide, 91 million tons of which was made in Europe – an unprecedented volume. Demand for traditional, fiber-based products such as books, graphical papers, magazines, and daily newspapers is currently in decline, but demand for tissue products such as diapers, paper towels, and toilet paper is at an unprecedented level. In addition, the demand for packaging paper and cardboard packaging is increasing due to the growing importance of the online retail trade.

For companies this means remaining viable by responding flexibly to the ever-changing market and optimizing processes as far as possible. However, this makes production more and more complex. In addition, companies are subject to regulatory requirements for reducing CO₂ emissions as well as for forest protection and conservation. Growing environmental awareness on the part of consumers who prefer eco-friendly products over other goods is also an important factor. Efficient production requires not only digitalized processes but also recycling and alternative sources of raw material. Thus, it is imperative to consider the product lifecycle as a whole: fibers are optimally used and reused until recycling is no longer possible. For example, residues and by-products are further utilized – for instance thermally – in order to generate energy.

New technologies are also making it possible to obtain cellulose not only from wood but also from numerous other plants or grasses such as banana peels or eucalyptus – all of which are fast-growing and natural raw materials. It is also the case that former waste products, including plant parts such as tomato stalks, nutshells, textile waste, or leather residues, can be utilized in various ways – such as in new, special paper grades.
This opens up completely new business areas, especially in cooperation with other industry sectors. For example, the construction industry is relying on environmentally-friendly filling and insulating materials made of pulp or fibers. Composite materials making use of fibers or paper materials are also becoming increasingly important in building construction. Mixed with aluminum or plastic, the building material exhibits the advantages of all the materials used: while the renewable fibers have good insulating properties, aluminum ensures greater stability. The chemical industry is also increasingly relying on eco-friendly raw materials – such as extracting substances from eucalyptus for use in cosmetics. In addition, there are numerous other products such as biofuels, bike helmets, as well as body panels for cars, aircrafts, or railway car interiors.

**Fully tapping into the potential**
The key to a future-proof fiber industry lies in these and other new business segments. This requires digitalization of the processes as well as networking of the entire value chain, from the supplier to production, all the way to service and the consumer. There are many advantages related to this. This is because comprehensive analysis of the data collected and processed in
this way enables optimization of processes on an ongoing basis and conservation of resources, making production more efficient and ultimately saving money. This is the only way to enable companies to respond flexibly to the changing demands of the market and consumers – thus fully realizing the potential of Industrie 4.0.

To make this possible, Siemens is supporting the fiber industry with its comprehensive Sipaper portfolio. It is integrating software and hardware solutions ranging from integrated drive systems via Comos and Simit to the Simatic PCS 7 automation software, allowing tools and software to be seamlessly combined within the entire value chain and processes to be further digitalized. The competitiveness of plants can be sustainably increased, and processes are continuously undergoing further optimization. Designed as an open operating system for the Internet of Things, MindSphere enables customers to analyze recorded data securely and efficiently. The Sipaper Drives APL solution also continuously analyzes the most important data and makes it accessible to the operator. In this way companies that are only at the beginning of digitalization can take a decisive step toward successful implementation of Industrie 4.0.

**Significant gains for Industrie 4.0**

- **Minimal wastage** through the monitoring of the value chain in real time.
- **Highly customizable manufacturing, on demand.**
- **Enhanced communication** with the consumer base.
- **Reduced CO₂ emissions** due to the increased energy, material, and logistics efficiency.
- **Significantly increased efficiency** in energy consumption and the use of materials.
- **Reduced error rates and maintenance costs** due to the continuous monitoring of asset performance.
- **Increased production efficiency** through the control of plant operations and distribution processes.
- **Maximized logistical efficiency** based on efficient dovetailing of the process steps in the value chain.
Since the second half of the 19th century, the Kingdom of Sweden has evolved from an agricultural country into a modern industrial society. It is now seen as the most significant economy in Northern Europe. It has a variety of robust industries with a high demand for equipment, machinery, and other technical products. It also stands out for its high degree of innovation and new technologies, and is valued by creative and technology-oriented customers and consumers as well as companies operating globally, including a relatively high percentage of large corporations. In 2006, the Swedish government announced plans for the complete changeover to renewable energies by 2020 in order to end its dependency on fossil raw materials and nuclear power.

In addition to important technical core industries such as the metal and electrical industry, mechanical engineering, the automotive industry, electrical engineering, the IT sector, the energy industry, and medical technology, the chemical and fiber industries are also significant in the overall Swedish economy. With 67.1% forest cover, Sweden is ranked 16th worldwide in terms of forested land mass. As a result, wood and paper industries account for more than 13% of the country’s industrial value chain. In the overall assessment of the World Economic Forum’s Global Competitiveness Report 2016–2017, Sweden is ranked 6th out of 138 as an attractive investment location. According to a recent study by the International Institute for Management Development (IMD), Sweden is ranked second for its digital competitiveness index (Germany is ranked 17th).

Made in Sweden

As Northern Europe’s largest economy and an important base for doing business, Sweden is considered by companies to be innovative and business-friendly.

Siemens in Sweden

- Construction of the first telegraph lines in Sweden (Stockholm-Gothenburg, Stockholm-Malmö)
- Since founding Tekniska Byrå in 1893, Siemens has been active in Sweden for 124 years
- Company becomes a stock corporation in 1898 and is renamed Svenska Aktiebolaget Siemens & Halske
- In 2003 Siemens acquires steam and gas turbine power plants in Finspång, which later becomes Siemens Industrial Turbomachinery AB
- Today: 4,200 employees at approximately 40 sites
First movers

Despite facing the challenges of market disruptions and global competition, the Swedish fiber industry remains one of the powerhouses of innovation, says Mikael Leksell, CEO of Process Solutions at Siemens AG.

Mr. Leksell, Sweden is home to some of the biggest and most renowned global fiber companies. What makes Sweden so well suited to fiber production?

Mikael Leksell: What makes Sweden so unique is not only an abundance of raw materials and resources, but also an excellent infrastructure in terms of transport, electrification, and communication. On top of that is a highly skilled workforce with vast expertise in the fiber business: Swedish fiber companies have a mindset that is progressive and innovative and they have the skills to act on this approach – which is why they have weathered the changes in the market so well.

What changes are we talking about?

Leksell: Paper mills were among the first industries to feel the impact of digitalization – their newsprint business saw a massive decline with the advent of the Internet. At the same time, the market for paper board, food and beverage packaging, and fiber-based hygiene products grew enormously due to changing consumer behavior, especially in Asia. Companies had to rethink their business models and rebuild their paper mills – and all within a very short time. The Swedish fiber industry was among the first to act on this change with both machine builders and fiber companies using advanced technology to increase...
Mikael Leksell

Per Mikael Gustaf Leksell has been CEO of the Process Solutions Business Unit at Siemens AG since 2016.

From 2010 to 2014, he was responsible for fiber industry applications at Siemens.

From 1997 to 2010, he worked in various capacities in Sweden, including positions as project and sales engineer, industry service manager, and country division manager industry solutions.

Leksell completed his studies in mechanical engineering at the Royal Institute of Technology in Stockholm, Sweden.
flexibility and efficiency and to optimize their manufacturing processes in order to remain competitive.

What does the new fiber business look like?

Leksell: The market has become a lot more global and diverse. This is especially true in the food and beverage industry where fiber products are tailored not just to enable convenient handling, but also to offer a substitute for traditional packaging – for example, to replace plastic wrapping. Cellulose-based packaging not only comes from a renewable resource, but it can also be modified to help preserve food better, thus addressing both the issue of sustainability and food safety. Fiber products provide a more sustainable source for the textile industry when replacing cotton, which is often grown in competition with food crops. And last but not least, trees can also be a source for a whole range of new products – from biofuels to green chemicals. Scandinavia and the Swedish fiber industry in particular are driving forward these new applications and using automation technology and digital tools to upgrade their plants and businesses accordingly.

What opportunities do you think this provides for Siemens?

Leksell: I believe that we can offer a lot of tools to benefit the fiber industry: we are one of the largest global industrial software companies and we offer wide-ranging industry expertise in automation and electrification. We can support the fiber industry with tools for the remote monitoring of operations, optimization of lifecycle and asset performance through digital plant models, and for streamlining design and engineering processes – and we have an equally strong footprint in the physical world with a large installed base and a broad portfolio of products for automation and electrification, as well as a global network of fiber industry experts. So we are in an excellent position to offer solutions that will help the fiber industry exploit the opportunities of digitalization while securing investments and offering real value. When we introduce new technologies, we need to be able to show the value they can offer in these key areas. And together with the fiber industry, we have already achieved a lot. I started my career in the fiber business at seventeen, working as a nightshift operator during my studies in what was then a largely analog plant with local control. Today, you can monitor and support the operations of a paper mill in China from a central control room in, say, Stockholm – the changes have been extraordinary. And now we are talking about the next challenges: how to securely and productively bring the assets in the fiber industry to the Industrial Internet of Things, how to provide smart tools for decision support and process improvement strategies – and how to ensure that the intellectual property of our customers and partners remains secure in an increasingly open and collaborative world. And again, Sweden is in a good position thanks to its skilled workforce and strong IT industry. I am excited to see what the future will bring.

"And now we are talking about the next challenges: how to securely and productively bring the assets in the fiber industry to the Industrial Internet of Things."

Mikael Leksell, CEO of Process Solutions, Siemens AG
Paperless in everyday life – utopia or reality?

Paper plays a part in our lives in the most diverse ways in almost everything we do. People try again and again to make day-to-day life paperless, but is a life completely without paper really possible? And what would it look like?

Graphic paper

Whether at work or at home, leading our daily lives without any magazines, print-outs, notepads, and address books on our desks would probably be unthinkable for many. Some companies have already tried to convert their workplaces to purely digital ones – but it was never possible to put this idea into practice permanently. For example, there are still concerns that digital documents have no legal validity or are not adequately protected against unauthorized third-party access. At the end of March, a regulation was passed which ensures that electronic documents are legally recognized throughout the EU. However, no matter the form, location, or time at which we hold graphic paper in our hands, it will still be a while before sensible and practical alternatives prevail and are accepted in our daily life.

There’s paper here, too:

Living in a cardboard box?

Inspired by a tomato carton, the Dutch company Fiction Factory developed the Wikkelhouse. It is sustainable, recyclable, and designed to last 100 years. To achieve this, wooden cladding was glued to 24 layers of corrugated board, protecting it from environmental effects. Darmstadt Technical University is currently researching buildings made of paper; see p. 26.
**Hygienic paper**

What would life be like without tissues, paper napkins, paper towels, diapers, or even toilet paper? One person or another might think that it wouldn’t be so difficult, but how often do you habitually reach for a paper towel instead of using a cloth? And what would happen if from one day to the next the production of toilet paper were halted and you had to look for alternatives? Everyday life with cloth handkerchiefs or napkins needing to be washed after each use, or with hand dryers, which also stir up germs and bacteria along with the air, would certainly be quite inconvenient.

**Packaging paper**

Thanks to the rise in online commerce, the packaging industry has experienced an upswing in recent years. But what would happen if there were to be no more paper packaging for our orders or for private parcel delivery? Regardless of whether it involved books, electrical appliances, clothing, or food, everything would arrive either unpackaged or in paperless packaging. Do you think our purchases would all still be in perfect condition? In addition to shipping boxes, there are many other forms of packaging made out of paper, such as moving boxes, paper sandwich wrappers, or paper bags. There will probably not be a paperless alternative to paper shipping boxes any time soon. There are several other packaging paper products which would be easier to do without in day-to-day life, for example by simply taking your lunch in a container instead of using sandwich wrappers.

**Dining out in a cardboard restaurant**

Furniture made only out of cardboard already exists: lamps, stools, shelves, chairs, tables, beds, and decorative items. A cardboard restaurant was presented at the International Home Fair in Milan, and in Shanghai and Taiwan there are already the first Carton King restaurants, where virtually everything is made from cardboard: even soups are cooked in cardboard woks.

**Paper in sports and recreation**

Paper airplanes and kites in the sky are a familiar sight. Paper boats have also been floating on various bodies of water over the past few years. They compete in paper boat regattas – sponsored by the Water Rescue Service on Lake Tegernsee, Germany, for example.
A sectional drive is at the core of every paper machine. A high volume of process and control data is used for controlling its complex functionality. Both intelligent and accessible at any time, the new Sipaper Drive Performance Analytics MindApp evaluates machine data while creating a new benchmark for transparency in the fiber industry (pulp and paper industry). Energy consumption, productivity, start-up times, web breaks, and operator intervention are analyzed without additional configuration effort or added expense. Clearly structured evaluations ensure transparency and allow the causes of a shutdown to be rapidly detected while identifying potential for optimization in the production process.

Is there anyone who did not enjoy making paper airplanes as a child? There are countless techniques for folding large or small paper airplanes able to fly two, three or even five meters. And then there’s this one: a paper airplane that flies more than 69 meters! That is seven times the length of a London double-decker bus or nearly as long as the rotor blade of a wind turbine, and nearly sets a world record. The beauty of it is that everyone can make this super airplane, and there isn’t much to it at all. All you need is a sheet of A4 paper.

The instructions are available here: youtube.com/watch?v=EDiC9iMcWtC

We are in the midst of a transformation from an analog to a digital economy. This development is also forcing the fiber industry to reposition itself. Siemens is supporting this industry with a comprehensive portfolio and long-term partnerships. The demo center in Erlangen, Germany – Sipaper World – shows visitors many different aspects of automation and drive technology – directly on-site or via livestreams, remote access, or as presentations. A big attraction is the fully functional model of a paper machine including a control room. All related processes “above and beyond the machine” can be controlled and simulated from the control room.
Simply minimize hazards

With its extremely complex processes, drive technology in the fiber industry cannot afford to have any vulnerabilities, because any fault or malfunction can have fatal consequences. The primary objective is therefore to use technology to minimize potential hazards to the operator, machine, and the environment, without adversely affecting the industrial production process. The comprehensive safety concept Sipaper Safety Integrated reliably eliminates sources of danger and minimizes risks — efficiently and in accordance with prevailing standards. Sipaper Safety offers the following advantages:

- Integral component of the Sipaper Drives APL and Sipaper Winder APL drive solutions
- Velocity monitoring using standard components
- Convenient selection of operating modes on control panels and WinCC stations
- Entry of new diameters for the safety program via the operating system (without new commissioning)
- Integrated diagnostics via the existing operating system
- No additional hardware required

The concept works with significantly less engineering effort and ensures higher availability and system consistency. All the requirements of EN 1034 are fulfilled with a patent-pending process.

The brochure is available here: siemens.com/sipaper-safety-en

Major contract for Siemens at BillerudKorsnäs Gruvön

Siemens has won the contract from a large Swedish industry customer, BillerudKorsnäs in Gruvön to supply equipment for their “Next Generation” board machine. As of the first quarter of 2019, 550,000 tons of board paper, among other things, liquid packaging solutions will be produced at the plant. At approximately 600 million euros, it is the largest investment in the history of BillerudKorsnäs. The commission will be jointly executed by Siemens and Voith as the machine supplier. Siemens will be responsible for the engineering, installation, and delivery of medium-voltage process motors and the sectional drive of the Sinamics drive system, and will even supply the Simatic PCS 7 process control system based on Sipaper solutions. The new Sipaper PCS 7 platform at the paper mill lays the foundations for further digitalization solutions such as the Sipaper Drive Performance app, Control Performance Analytics, and other applications that will help increase plant output.
A sheet with many sides

Whether as a newspaper or book, packaging material, or hygienic utensil, some 1,900 years after its invention, paper continues to be widely used in everyday life and continues to be an indispensable material. Many find fault with paper making – it is said that the process is too elaborate, that it wastes resources, or that it harms the environment. But a sheet always has more than one side – what is behind these common myths about paper?

“The paper industry destroys forests”

Between 2005 and 2015, European forests grew by 44,000 square kilometers – an area larger than Switzerland. Their sustainable use is crucial for the paper industry so that it can benefit from this renewable resource in the future too. It makes up a comparatively small share of deforestation: energy generation uses half of the global timber harvest, 28% is utilized for construction work, and only 13% for paper production. Protecting forests is essential for preserving biodiversity. According to the 2011 CEPI Sustainability Report, half of European forests and 92.2% of forests managed by the paper industry are now certified according to international standards. This ensures that the wood processed is mainly from sustainably managed forests. The situation in the southern hemisphere is more critical. The hunger for arable land in the tropics is especially insatiable, for example for palm oil and soybean plantations, and vast forest areas are still being cleared.

“We could just recycle and not cut down any more trees”

Europe is already the world champion in recycling: more than half of all paper is recycled, and nine out of ten newspapers are made from recycled paper. However, this process also has its limits. Cellulose fibers can only be processed about four to eight times. When they can no longer be used, they are converted into renewable or green energy. In order to keep the paper cycle alive, fresh fibers must be added again and again. Recycling is not suitable for all types of paper, because the desired characteristics can sometimes only be achieved with fresh fibers, as can be seen in graphic paper. Moreover, roughly 19% of paper is not really recyclable, since it stops being recycled after being used as toilet paper or cigarette paper or is archived in the form of books and documents. The goal of the European paper industry is therefore to maintain the current recycling rate of 70%.
“Paper production consumes too much energy”

Like all industrial production, the paper industry also needs energy, in particular for operating machines and drying paper webs. In Germany roughly 800 kWh of energy is used to produce 200 kg of paper, which is the average annual per-capita demand in the EU countries. This amount of energy would allow a computer to run continuously for up to eight months. Around half of the energy consumption of European paper mills comes from renewable energy sources that are carbon neutral. The paper industry uses waste material from the pulping process to generate biomass energy used in its own production processes. Any surplus energy is then often sold locally.

“E-communication is better than paper-based”

Whether we send an e-mail or a letter, both types of communication have an impact on the environment. There is no easy answer to the question of which is more environmentally friendly. For a lifecycle assessment, the entire lifespan of the means of communication must be considered – and that is a short one for computers and smartphones: approximately ten million tons of electronic waste are generated annually in the EU, but only 2% of this electronic waste is recycled. In comparison, the European paper industry recycles about 70% of the paper produced. It takes a lot of energy to produce paper, but the energy consumption from online activities should not be ignored. A total of 4,239 average households could be supplied with energy from the power consumption of all Google searches in a single month. Compared to average annual electricity demand in EU countries, cloud services are already ranked sixth worldwide, with an expected increase of 63% by 2020.

“Paper production harms the environment”

Paper as a climate killer? In actuality, the environmentally-friendly properties of paper go all the way down to its “roots.” Everything begins in the forest. The renewable source and sustainable origin of every sheet of paper is a tree, which uses photosynthesis to process millions of tons of carbon dioxide, thereby keeping the air clean. Once stored, the carbon remains a part of the wood during further processing – for the life of the paper until it is recycled. After only five years, this reduces the CO₂ footprint created by the release of carbon dioxide during the production process by about 5%, and by 75% after 100 years. With anticipatory forest management, the paper industry is helping to reduce CO₂ emissions worldwide. Although production has risen in recent years, the impact on the environment has declined considerably.
From forest wood to cardboard

In Beihai, China, Stora Enso has implemented the entire value chain at a single site, from forestry and pulp production through to finished packaging cardboard.
Pulp is primarily made from wood and is the base material for paper. It is thus a logical step for the company to handle the entire value chain, in other words, not just paper production but forestry as well. This vertical integration strategy is being followed by Stora Enso, the second-largest forestry company in the world and one of the largest manufacturers of paper and packaging materials.

About 50 kilometers outside Beihai, in the southeast of the Chinese province of Guangxi, the Finnish-Swedish conglomerate set up a production mill for special cardboard on a greenfield site. Prior to this, a forest plantation was established covering 90,000 hectares including 72,000 hectares as a dedicated eucalyptus plantation.

Two types of special cardboard are produced there for the local packaging industry: “liquid packaging board” for packaging beverages, and other liquids and folding box board. A decisive factor was that previously as much as 80% of the special cardboard impermeable to liquids needed for the Chinese market had to be imported. This situation changed at the beginning of 2016, with the mill in Beihai now producing 450,000 tons of liquid packaging board and other products per year directly in China. In the final phase, some 1,000 jobs will be created here, along with about 30,000 additional jobs at suppliers and customers in the region.

It all started with the eucalyptus plantation in 2002. Eucalyptus was purposely used because it grows rapidly and is an excellent source of raw material for pulp production. The plantation sets a high standard for sustainable paper production.

Energy and drive technology from a single source
Construction of the paper mill began in 2014 and was completed in early 2016. Since then, production has gradually increased to maximum capacity. Stora Enso wanted to work with a partner with a solid international presence, especially with an excellent reputation for electrical equipment and automation technology. The company was not concerned only about sufficient experience in the paper and pulp industry. A decisive factor was also the ability to guarantee long-term provision of technical service and local availability of spare parts.

With its Sipaper distributed control system (DCS), Siemens was a particularly suitable choice, especially because the company already had a solid infrastructure and presence throughout China.

The order for Siemens also included solutions for proprietary energy generation and mill-wide power distribution with the required high-, medium-, and low-voltage switchgear, as well as grid, power, and distribution transformers. The system was supplemented by an emergency power supply and energy monitoring and control systems. In the area of drives, Siemens supplied an integrated system with over 160 drives, including industry-specific control features. Precisely coordinated low- and medium-voltage motors, frequency converters, and a solution for energy switching and monitoring (ESM) ensure high efficiency and maximum plant availability.

For Siemens this mega-project has been much more than a traditional customer-supplier relationship.

“This project is a highlight in the cooperation and partnership with Stora Enso.”

Engelbert Schrapp,
Corporate Account Manager, Siemens
450,000 tons
of liquid packaging board produced per year directly in China since the beginning of 2016

80 percent
of liquid packaging board needed for the Chinese market previously had to be imported

72,000 hectares
for a single dedicated eucalyptus plantation

The plantation sets a high standard for sustainable paper production.
In addition to supplying and installing the electrical system and process automation, Siemens assumed responsibility for all the necessary drive and engineering solutions. Siemens was the single-source provider of detailed planning, monitoring of the installation, and commissioning of all electrotechnical systems.

**Standardized process automation**

With its Sipaper Distributed Control System (DCS), Siemens offers no less than 100 years of industry experience and a portfolio of products and solutions specifically tailored to the pulp and paper industry. At the same time, ever stricter environmental requirements in China are taken into account, along with requirements imposed by global competition.

The paper industry in particular has to contend with changing demand due to digitalization: while growth in the e-commerce sector is creating an upswing in demand for cardboard and other packaging materials, the importance of paper is noticeably diminishing due to more widespread digitalized communication and information.

Sipaper offers more than extensive horizontal integration through frequency converters, motors, connectors, and gearboxes from a single source. Achieving seamless vertical integration is also a considerable advantage, thanks to completely digital automation ranging from field devices and the controller level all the way to manufacturing execution systems (MES). All process control at the new Stora Enso mill is handled by the Simatic PCS 7 process control system.

The automation system controls not only the entire production sequence for pulp and downstream cardboard production, it also regulates the steam turbines, guaranteeing a reliable energy supply for the production mill. Every function in the entire production complex is controlled from one central control room.

**Reliable partnership**

“This project is an important milestone for the Fiber Industry Division of Siemens but is also a highlight in the cooperation and partnership with Stora Enso,” says Engelbert Schrapp, corporate account manager at Siemens, about the outcome. In his view, overall responsibility for the areas of energy and automation as well as the strong presence of the company in China were crucial. “Basically there were no problems. This was the smoothest turnkey project of all time thanks to the close cooperation and long-term commitment of Siemens,” says Schrapp.
Increasing productivity is a critical driver for staying competitive, especially for industries that add a great deal of value such as the pulp and paper industry. Production and process data need to be captured, filtered, and structured, allowing intelligent analysis to transform it into specific added value.

Well-maintained process control systems support analytics of this kind, and with correspondingly configured process control loops contribute to a lower level of variances, optimal plant utilization, and greater process operability. Manual or automatic mechanisms can be used comprehensively for monitoring control accuracy. However, depending on corporate philosophy, pulp and paper companies have differing perceptions of whether it is worth investing in reliable control accuracy monitoring and if so, how much to invest.

**A key to increased productivity**

In the process industry, the lifecycle of process control loops can be as long as 30 years. Continuous monitoring of control accuracy in ongoing plant operation is crucial in order to keep the performance of all process control loops of a given plant transparent. In this way specific maintenance, service, and adjustment measures can be planned in detail and implemented in a focused manner. In addition to established software tools for monitoring control quality which can be installed locally in a plant, there is also a new cloud-based service available: Control Performance Analytics (CPA).
Industrial software

There are typically more than 400 process control loops installed in large paper mills. Various studies show that on average only 50% of the process control loops are optimized in the process industry, particularly in the pulp and paper industry. Through CPA it was possible to establish that 61%–86% of process control loops were poorly adjusted. Included in this analysis were six pulp and paper mills in Sweden, Finland, Germany, and China.

Reducing operating costs
Thus, assuming that about half of process control loops are not optimally adjusted, or up to 200 process control loops, such a plant would be operating extremely inefficiently, and this would have a direct impact on operating costs.

About 30% of all process control loops typically run in manual mode, and about 25% are still operated using the original parameters from commissioning. Each controller requires approximately 10 to 14 expert hours – in total over one and a half person-years – in order to initially identify the appropriate process control loop, investigate it, and then optimize its control performance.

Automatically increasing transparency
CPA eliminates the time-consuming process of manual identification. The automatically calculated optimization recommendations can be used and thus reduce time needed for implementation of these measures alone to only two or four hours. CPA performs these analyses automatically and prioritizes the process control loops requiring assessment by a control technician. CPA calculates the parameters and recommends those requiring optimization. The control technician can then concentrate on the process control loops identified and begin with the most important one. After optimization, control accuracy is continuously captured in order to detect deviations in a timely manner.

Long-term process optimization
Process data is supplemented by CPA. Automatic status detection and a KPI calculation for different control states enable the required continuous transparency to be achieved. CPA makes it possible to optimize processes in the long term and support fine adjustments in a way that makes sense. On a secure web portal the results for all levels – from plant manager to machine operator – are made available securely over a long period of time. The plant operator does not need to build up any resources or acquire specific expertise, and it is also possible to claim this “managed service” as a business expense. This saves on costs while also creating the basis for decisions based on facts.

In the “pay-per-use model,” the operator has a high degree of flexibility regarding the number of controllers to be analyzed over a certain period of time with what are known as “controller months.” For example, different controllers can be controlled in different numbers per month over variable time periods.

In fact, small control deviations not only improve the quality of the product but also make it possible to operate closer to production limits. In this way production tonnage can be increased, energy consumption reduced, and savings in raw materials achieved.
“Building with paper” – this year research is being carried out in this area at the Darmstadt Technical University in Germany as part of a new project called BAMP! We talked about the project with Robert Götzinger, a research associate specializing in paper fabrication and mechanical process engineering.

Why are you doing research on the topic of building with paper?

Robert Götzinger: People have been building with wood for a very long time, even constructing multi-story structures. However, with this material many things are dictated by nature, such as fiber orientation or the presence of knots. Paper has the advantage that we can modify a wide range of physical properties in a targeted way. This means it is theoretically possible to use paper to manufacture everything that you can manufacture with wood. And paper offers even more advantages: The fibers can be chosen selectively and functionalized, can be manufactured cost-effectively, and are a lightweight, recyclable material. Especially given the fact that there is a growing need for temporary structures, it is necessary to ask how natural products can be handled sustainably. Paper offers great potential here.

Several buildings made of paper already exist. What is it about your structures that’s new?

Götzinger: It’s not just about building a single building, it’s also about exploring the fundamentals of building with paper. For example, the findings would then be useful to architects, construction engineers, or paper engineers as a tool of the trade and would help them understand and correctly use paper as a building material. We are of course just taking the first step here. It will take a long time to reach the level of knowledge that already exists for established construction materials.

This seems to be a field involving many disciplines. How is research done in such an area?

Götzinger: Our team includes one or more chemists, construction engineers, architects, mechanical engineers, and paper engineers. Each discipline then deals with a specific problem, and coordination takes place on a regular basis while pursuing the same final objective. In several iterative loops we develop what is known as our demonstrators. These clearly show each participant where the challenges and potentials lie. On the one hand, we can learn what works and what does not, and on the other we have an object that you can actually touch.

What are you working on in your doctoral thesis?

Götzinger: The focus of my doctorate is targeted adjustment of the fiber orientation in paper. The more the fibers are oriented in one direction, the greater the strength in this direction. Generally speaking, we want to place certain fibers in a certain position. The papers which are produced in the process serve as reinforcement for components subject to especially high loads. However, the technology can also be used in other ways. For example, the fiber orientation could be used to control the transport of fluid in paper.
Aren’t you afraid that the buildings will burn down or that the paper will dissolve in the rain?

Götzinger: That is what most people first think of when I talk about the project. However, there are ways of making paper function in such a way that it does not burn or immediately soften. The challenge for my colleagues in the chemicals industry is therefore to make fire and moisture protection a reality with chemicals from renewable raw materials. This could be achieved by modifying fibers at the molecular level or by applying functional layers.

What other difficulties and challenges are there?

Götzinger: We are trying to combine, reformulate, and connect suitable papers and paper products with each other. Based on this, we are developing specific methods for simulation, design, and construction of individual components. At the same time, we want to adapt the properties of papers to closely meet our requirements. Last but not least, people should later feel comfortable in a building of this kind, so that design also plays an important role.

You have already said that you are still far from the knowledge we have about established construction materials. Where are you putting your initial focus? What approach do you follow in development?

Götzinger: Our initial focus is temporary structures that are built to stand only for a limited period. In the first iterative loop of the demonstrator’s evolution, we have defined suitable framework conditions. Our house will be constructed in Darmstadt, Germany and survive for at least one year, in other words make it through four different seasons with their various climatic challenges. We are planning a dwelling with one occupant that has 40 m² of floor space. At the moment we are assuming there is already a concrete foundation. There are then three steps: First we consider the structural analysis of the house, in the second step moisture protection, and in the third protection against fire. Once we have found, tested, and evaluated the solutions, we will devote ourselves to building another more complex demonstrator. Then the framework conditions will become more complicated. A further difficulty is designing as many components as possible from renewable raw materials. In an ideal scenario, this would allow the building to be completely recycled.

Finally, a question about costs. How is the project being funded?

Götzinger: The project runs for four years and has received € 4.6 million from LOEWE, the State of Hesse’s Offensive for the Development of Scientific and Economic Excellence. We are also hoping for support from industry – through the donation of building materials, for example.

Robert Götzinger

Götzinger received his BA in Mechanical Engineering from Darmstadt Technical University, specializing in the area of paper technology. In 2016 he graduated with a master’s degree in this field and a master’s in Mechanical Engineering. Since then he has been working as a research associate at Darmstadt Technical University in the field of paper fabrication and mechanical process engineering under the direction of Professor Samuel Schabel. In the research team of the BAMP! project, he is working on targeted adjustment of fiber orientation in paper. He is a member of the Darmstadt Academic Paper Engineering Association and the Zellcheming association.
A perfect loop

Six years ago, the EU commission launched “A Roadmap for Moving to a Competitive Low-carbon Economy by 2050.” On one hand, the fiber industry plays a central role in the planned bioeconomy. On the other, this requires a technology push in order to sustainably reduce emissions.
The roadmap describes a research expedition into the future. The fiber industry is regarded as having the potential to act as a key platform for a number of products on an organic and sustainable basis as well as for the entire recycling sector.

Paper is one of the most recycled materials in the world. According to the Institute of Scrap Recycling Industries (ISRI), in 2015, about 52 million tons of paper valued at US$ 7.7 billion were collected, sorted, and processed in the United States alone. In Germany, the amount of recovered paper amounted to 15.2 million tons out of a total consumption of 20.8 million tons.

Using raw materials sustainably is the equivalent of creating maximum value from a wood fiber before it is used for creating energy at the end of the process. On one hand, a recycling loop of this kind requires high-quality virgin fibers allowing such use. On the other, more and more innovative technologies are necessary in the entire process. This calls for experienced and strong partners with the necessary expertise to develop standardized solutions and processes and to take advantage of the opportunities offered by digitalization along the entire value chain. Ultimately, it is about more than recycling and new products: a new climate and energy concept should emerge from the Confederation of European Paper Industries (CEPI) roadmap and other roadmaps.

In addition to fibers traditionally extracted from wood, cellulose can be extracted from a variety of new sources, and using “waste” such as disposable products, plant residues, milk, or even leather residues will no longer be a utopian vision. The end products of the fiber industry could replace carbon-intensive products based on fossil fuels, for example in construction, as sources of energy, in the chemicals industry, for packaging, or for many other purposes.

According to ISRI, using recycled raw materials can reduce energy consumption in production by up to 68% – and thus also achieve cost savings. It’s going to be an exciting journey.
The new side of lignin

Lignin is seen as undesirable in paper production because it contributes to paper yellowing. To avoid this, considerable chemical effort is required to dissolve it out of wood. However, lignin is one of the most mechanically- and chemically-resistant polymers, and has highly interesting properties.

Stora Enso has been conducting research into lignin for 15 years. We spoke to Mikael Hannus, vice president of the Group R&D Innovation at Stora Enso about this.

Lignin is the second most abundant organic polymer on earth, exceeded only by cellulose. It is an organic substance which causes lignification of a cell when embedded into the cell wall of a plant. The content of lignin is higher in coniferous trees than in deciduous trees and it ensures high compressive and tensile strength in wood. Researchers at Stora Enso (SE) regard lignin as a challenging and complex material with application opportunities in the construction and automobile industries.

Mr. Hannus, please introduce yourself and provide us with a little information about your role within SE.

Mikael Hannus: I’m a pulping technology engineer with the most exciting job at Stora Enso – driving collaboration with our partner universities as well as a number of other interactions around R&D.

You have been researching and examining lignin and its value for the fiber industry for several years now – could you give us an insight into your work and the particular challenges of this complex substance?

Hannus: Our approach is to find the best fit between the natural structure of lignin, the processes we use to extract and separate lignin from wood, and, of course, the applications for which our customers use this complex structure of natural aromatics.

Lignin is the second most abundant organic material on earth. However, it is far from desirable in paper production because it contributes to paper yellowing. To avoid this, great chemical effort is required to dissolve it out of wood. Do you think the significance of lignin as a raw material for the fiber industry has been previously underestimated and what role will it play in the future?

Hannus: Actually, many forest-based products utilize the benefits of lignin – in addition to all solid wood products, we want to use some of the properties of lignin in magazine papers, fiber-based packaging grades, and in new materials or chemicals. What is often overlooked is the fact that the chemical recovery cycle of a kraft mill requires reaction conditions as a result of which 70% – 80% of the lignin released from the wood needs to be burned to achieve the high temperature chemical regeneration – of course, that heat is recovered as steam for power and heat supply to the mill and associated energy markets.

What is the value of lignin for the fiber industry and how can it be utilized?

Hannus: It is important to remember that there are many types of lignin – each with very different properties, uses, and values. It is only possible to valorize lignins that are fairly clean and well defined. The value lies in the aromatic structure, reactive groups in the structure, and the size of the natural aromatic molecule.

How do you see the fiber industry developing and how will SE realign with these developments in order to stay ahead in the future?

Hannus: The demand for fiber has seen a healthy growth and we expect this to continue thanks to global megatrends and the need for sustainable solutions in construction, packaging, hygiene, special chemistry, and the textile industry. We are currently undergoing a transformation in which the declining share of printing paper business is
being replaced by a growth in fiber-based packaging and cellulose fibers for special applications within the hygiene and textile industries.

**What trends, innovations, and topics do you think will determine the future of the fiber industry in the next 20 years?**

**Hannus:** Making more from less – meaning steady progress in resource efficiency, high recycling rates, new material properties that reduce the need for fossil-based materials, as well as the emergence of new services around the basic materials we provide to our customers.

**How does SE actively promote trend-setting developments in the fiber industry?**

**Hannus:** We invest a lot in R&D and the whole organization is driven by innovation.

**How is Siemens establishing itself as a partner of trust in times of changing markets?**

**Hannus:** Siemens is providing an enormous amount of specialized knowledge in relation to our production assets and related services, as well as long-term collaboration to capture the existing and future opportunities offered by biobased materials.
The intelligent paper mill

Greenpac Mill is a paper mill with the highest degree of automation in all of North America. It produces 540,000 tons of linerboard a year from around 100 truckloads of recycled paper a day. The brains behind it: the Siemens process control system.

Every day, around 100 trucks and several railcars arrive at the mill to deliver waste paper.

The process control system will provide a single view of the entire facility.
Every product ordered online reaches its final destination in a cardboard box, which today can be produced entirely from recycled paper. Paper manufacturer Cascades Inc. quickly saw a market opportunity and in 2011 began constructing a brand new paper mill in Niagara Falls, New York. Subsidiary Greenpac Mill LLC would not only manufacture innovative, lightweight packaging board, but also only use recycled paper (old boxes) in the process. Completed in 2013, the mill represents a technological milestone in American paper manufacturing. The technology also creates the optimal basis for further growth. 135 people have already found work here – in an area where previously many companies had to lay off employees or close down their offices. Every day, around 100 trucks and several railcars arrive at the mill to deliver waste paper. This is then turned into a very thin but high-strength corrugated cardboard that is shipped out in the form of rolls. Approximately 1,500 tons of linerboard are produced a day, the equivalent of some 540,000 tons a year.

**Collaboration by three partners**

Cascades decided to place the entire mill technology in the hands of just three specialists – for pulping operation, for the paper machine, and for the overall electrical and electronic equipment. That Siemens would be responsible for the latter was no coincidence: the company already had experience with Siemens and the specific industry solutions offered in its Sipaper line. Siemens supplied the entire power supply, including inverter substation for the paper mill and the wastewater treatment plant located next door at the sister Cascades medium mill.

**Efficiency across the board**

Siemens used variable speed-controlled drives for a large number of pumps. These drives ensure that the pumps consistently provide the exact rate of flow required by the process and, at low pumping capacity, also consume less power. Other features include dry-running turbo blowers, which deliver 50% more energy savings than conventional vacuum pumps.
The plastic that accumulates during waste paper treatment as well as other waste fiber stock or filling agents are transported to an external power plant, where they are thermally recycled. In return, the steam produced is used for the drying process in paper production. Most of the process water is also recycled, with the biogas generated during treatment suitable for use as a fuel for generating steam.

**Automation with no ifs or buts**
Greenpac Mill is the paper mill that has the highest degree of automation in all of North America. Siemens installed the complete automation system, from the drives to the controllers and the process control system. “Siemens is really the brains of the mill,” says Murray Hewitt, general manager of Greenpac, referring to over 700 drives and around 1,000 field devices such as belt positioners, flowmeters, temperature, or pressure sensors. Each of these components has a separate function block in Sipaper PCS 7 and is part of a seamlessly networked PCS 7 process control system. “Without automation and process control technology, everything would stop. There’s nothing you can do in this process manually – it’s that automated,” says Hewitt, adding: “We have the ability to access information 24/7 not only through the PCS 7 system, but certainly also from our laptops and even from our smartphones.”

Robert Harroun, account manager at Siemens, says the Greenpac Mill is “truly a smart digital factory facility,” and adds: “The only way to accomplish that is to have a Sipaper PCS 7 total automation solution.”

“Without automation and process control technology, everything would stop.”

Murray Hewitt, Mill Plant Manager, Greenpac
New technology for fast corrugation

Lake Utopia Paper produces some 185,000 tons of corrugated cardboard annually at a facility in a small town in southeast Canada. When the paper manufacturer wanted to modernize its plants, Siemens was awarded the contract – but a very tight time window allowed only 10 days to implement a complete Integrated Drive System (IDS). A “utopian” idea?

If you follow the course of the Magaguadavic River, you will arrive at St. George, a town with 1,500 inhabitants on the edge of the province of New Brunswick in southeastern Canada. Here, in the immediate vicinity of picturesque Lake Utopia, the paper manufacturer of the same name produces thousands of tons of corrugated cardboard annually for packaging products for customers in Canada, the USA, and Latin America. The company is part of the J.D. Irving Group, one of the largest employers in the region, and has been a successful enterprise since its founding in 1882.

In order to continue to operate sustainably and reliably and be able to meet the needs of its customers into the future as well, in 2014 Lake Utopia Paper decided to modernize its paper mill. As part of a comprehensive solution, Siemens was commissioned to upgrade the paper machine drive system to reflect the latest technological standards. The catch: in order to avoid downtime, only 10 days were scheduled for project implementation.

A narrow time frame for powerful technology
This was a real challenge for trusted partner Siemens, which had already demonstrated its expertise in advance: Prior to the contract being awarded to Siemens, Lake Utopia was convinced by the performance and efficiency of the Sipaper Sectional Drive System in Niagara Falls, New York, which is operated in a similar manner. For the modernization of the paper machine and mill, Siemens also relied on products from the Sipaper and Integrated Drive Systems portfolio, developing a precisely adapted drive solution. The Sipaper Advanced Process Library (APL) enabled a fast, cost-effective, and modular implementation.

During the 10-day turnaround, four Siemens experts worked on commissioning the paper machine. Not only the quality of the technology, but also the expert industry-specific knowledge Lake Utopia Paper has trusted for more than 25 years was decisive. This allowed the modernization to be implemented in a timely manner despite extreme time constraints: “Siemens closely monitored engineering, installation, and testing to ensure timely completion, which was very important for the overall success of the project,” says Justin Legere, project manager at Lake Utopia Paper.

Corrugated cardboard by the meter
In St. George, the paper mill is now operating again – and even more effectively than before. The modernized drive solution made it possible for Lake Utopia Paper to increase plant availability and the quality of its products, reduce downtime, and optimize energy consumption. “After implementing the Siemens solution, we were able to boost the speed of our paper machine to increase daily production,” explains Legere. In specific terms, the paper machine is more than 30 meters per minute faster than before – helping achieve a higher production of corrugated medium.

Integrated drive solution for paper machine and mill
- 1 modular solution consisting of 25 Sinamics S120 cabinet modules
- 4 Sinamics drives
- 23 Nema motors with an output of 30–300 hp
- 5 Simatic TP1500 Touch Panels
- 1 Simatic PCS 7 engineering and operator station
- 1 Sipaper PCS 7 master controller

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Churning out paper

Each day Schoellershammer GmbH & Co. KG produces roughly 1,500 kilometers of paper per paper machine. This makes the Düren, Germany-based company one of the leading producers of corrugated cardboard.

Demand for paper and cardboard is growing worldwide. According to an insight study published by Pöyry Management Consulting, the demand for tissue paper, corrugated cardboard, and cardboard in particular will increase even further by 2030, and yearly demand for packaging material and tissue/hygiene products will increase by up to 2.9%. The reasons for this are believed to include the boom in e-commerce as well as growing demand from international fast food chains and consumer goods manufacturers.

In response to these worldwide developments and other factors, the new PM 6 corrugated cardboard base paper machine was put into operation at Schoellershammer GmbH & Co. KG in December 2016. It is designed for manufacturing thin packaging paper with low basis weights, thus following the long-term trend in the packaging industry. On the PM 6, corrugating medium and testliner are produced with a net working width of 5.60 meters.

The PM 6 project was implemented within a very short time period by Siemens together with Voith Paper GmbH & Co. KG, and with TBP Piesslinger GmbH as the technical contact. Voith supplied the paper machine, including the material processing, the machine control system, and the covering, and Schoellershammer relied on the Sipaper portfolio from Siemens for the integrated drive solution.

Achieving success with integrated drive systems

The innovative Sipaper Drives APL software standard dovetails perfectly with the drive technology of Sinamics S120, ensuring consistent paper quality even as throughput increases. This IDS (Integrated Drive Systems) solution ensures that all components such as low-voltage converters, control cabinets, and the corresponding low-voltage motors are optimally combined, work smoothly together, and enable even simpler operation. The standard components of the Sipaper solution are individually configured to the requirements of the PM 6. Industry-specific regulation and control functions of the Sipaper Drives APL software standard deliver the best possible control quality with a significantly reduced risk of paper web breaks.

All-in service

With Simatic Virtualization as a Service (SIVaaS), Siemens also offers simple implementation of virtualization solutions by decoupling the operating system and...
Operating errors is minimized thanks to a uniform operating concept. Deploying a standardized PCS 7 system also means that no interface problems will occur. Schoellershammer can expand the system at any time, allowing it to remain flexible. In January 2017 the machine already produced 10,000 tons of saleable paper.

1,500 km

About 1,500 kilometers of paper a day is produced per paper machine at Schoellershammer GmbH & Co. KG.
Bright prospects

Laakirchen Papier AG (LPA), a producer of natural paper based in Upper Austria, is taking advantage of the changes that have become necessary in the industry: in the future, it will not only be involved in the growth market for packaging paper, but will also be setting its sights on becoming a digital enterprise.

Magazines, catalogs, advertising flyers – many print products have been an essential part of our daily lives for decades. However, due to the ongoing trend toward digitalization, more and more print media is disappearing with the emergence of online media. According to Laakirchen Papier, since 2008 the market in Europe for high-gloss magazine paper for printing magazines, newspaper supplements, and advertising materials has declined by 25%. However, for the Upper Austrian manufacturer of supercalendered natural paper (SC paper) that is no reason to bury its head in the sand. LPA is implementing a strategic change to remain viable into the future. For years the paper manufacturer has relied on Siemens automation technology to improve its operations management – specifically the Simatic PCS 7 control system. Now this Siemens technology will help Laakirchen Papier complete the transformation from a fiber industry player to a digital enterprise.

A virtual environment for energy control systems

Since October 2016, Laakirchen Papier has been using the Siemens solution to visualize the energy control system of its processes in a virtual environment provided by LPA. This enables the company to increase the performance of the plant and, thanks to the redundant server structure, minimize down-time. In addition, LPA is reducing computer hardware costs: small thin clients with 24-inch flat screens have taken the place of
The company manufactures 550,000 tons of paper annually on two paper machines, the PM10 and PM11.

individual computers at workstations equipped with large monitors, ensuring ease of use for users and operators.

PCS 7 offers a wide range of benefits. For example, if the performance of individual control loops goes down, plant operators can initiate targeted and timely measures for optimization and maintenance using control performance monitoring of the control system. The advanced process control (APC) is already a part of the standard function block library. With advanced control methods such as multi-variable control and predictive controllers, the Simatic Controller not only offers important features for improving plant efficiency and productivity but also contributes to plant safety and protection of the environment.

**Investing in the future**

This year, Laakirchen Papier is taking an important step to secure its market position in SC paper. As CEO of Laakirchen Papier AG Mark Lunabba explains, the company is changing its focus: "At present, the trade in printed advertising materials ensures constant demand. This means we will specialize even more in paper qualities for retail in the future." But that is not all. Because digitalization makes it crucial for companies in all industrial, social, and economic areas to offer a more diverse range of products and services to the market, Laakirchen also decided to break into the future-oriented packaging paper market. In the future, the paper producer will therefore focus on two core areas: one is the manufacturing of high-quality SC paper and the other the production of lightweight corrugated cardboard to meet increasing demand for packaging.

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